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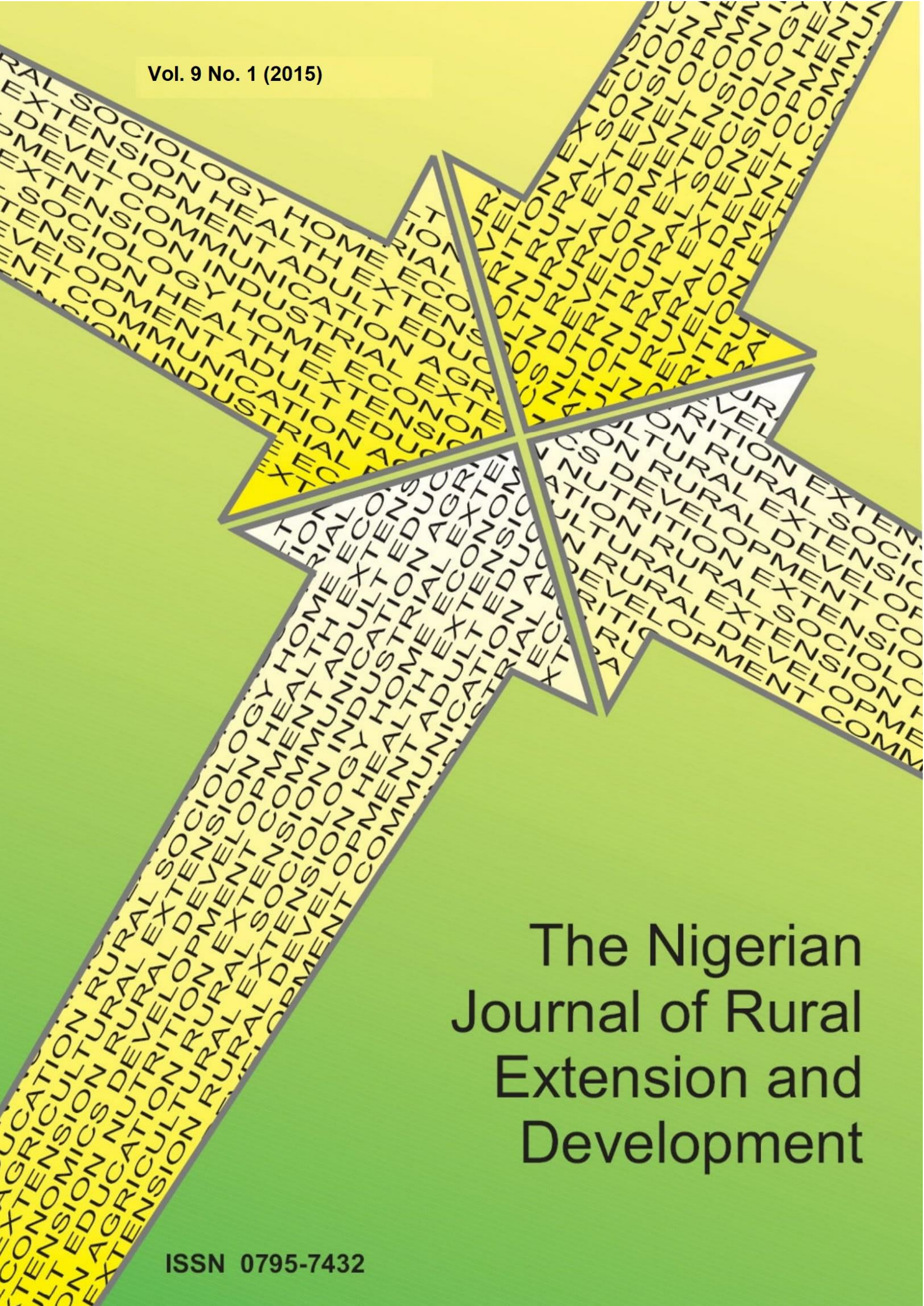

The Nigerian Journal of Rural Extension and Development

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THE NIGERIAN JOURNAL OF RURAL EXTENSION AND DEVELOPMENT (NJRED)

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The Nigerian Journal of Rural Extension and Development (NJRED), a referred journal, is an annual publication of the Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria. The journal is intended to encourage systematic and continuous publication of practical ideas and empirical research work in the area of Rural Extension and Development as it relates to Rural Development, Women in Development. Agriculture and Extension Education, Rural Sociology, Livelihood, Mass and Extension Communication, Health and Nutrition Extension, Home Economics, Adult Education and Multi-disciplinary Rural Extension issues.

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Gender Differentials of Cassava Processing Activities among Cassava Processors in Ogun State, Nigeria

Stella O. Odebode and T. A. Adetunji
Department of Agricultural Extension and Rural Development,
University of Ibadan, Ibadan, Nigeria.
E-mail: mrsdrodebode@yahoo.com & timdoyin@yahoo.com

ABSTRACT

Cassava is one of the major staple food crops in Nigeria, producing daily carbohydrate requirements for millions of people in the country. However, there is dearth of information on gender division of labour in cassava processing activities in the study area. This study assessed gender roles in cassava processing activities in Ogun state. Two local government areas Odeda and Ewekoro) were purposively selected because of the concentration of cassava processing activities in the area. From the sampled local government areas, 80 and 70 respondents were purposively selected respectively resulting in 150 respondents. Structured interview schedule was used to collect data and both descriptive and inferential statistics were used to analyse the data. Most (82.8%) adult female and (84.2%) of adult male were between 31-50 years of age respectively. Most (81.6%) adult males were married and 78.2% adult females were married. Most young male (88.9%) and young female (87.5%) had secondary education. Most adult female(92.0%) obtained information on cassava processing through friends. Majority of adult male (87.0%) and young male (78.0%) were always involved in uprooting of cassava tubers while most adult females (89.0%) and young females (88.0%) were always involved in peeling. The study concludes that cassava processing activities involved respondents from various gender categories with different roles.

Keywords: Gender differential, Cassava processing activities, Cassava processors

INTRODUCTION

Cassava (*manihotesculenta*) is one of the most common food crops in Nigeria; it is widely grown for its large tuberous starchy roots. It is a food security crop with many advantages over other crops and it has an annual production of about 80 million tones in Africa (Nweke and Enete, 1999). This translates into an estimated average of more than 300 calories per day for 200 million people (Nweke and Enete, 1999). According to Nigeria National Report (2006), cassava is the dominant staple food crop in Central Africa where it constitutes over 50% of the average staple food consumption in the Democratic Republic of Congo and the Central African Republic. Also in the coastal regions of West African, from Cote d'Ivoire to Nigeria, cassava is as important as yam. Cassava became popular with the introduction and implementation of Structural Adjustment Programme (SAP) in 1986 with an increasing output. This policy made cereals that were imported very costly, making cassava a relatively cheap source of energy. Increasing trends in output has continued in making Nigeria the world's leading producer of cassava since the beginning of the 1990s, with an estimated contribution of 40 million metric tonnes per annum and an average yield of 10.2 tonnes per hectare (Nigeria National Report, 2006).

Traditionally, cassava is regarded as a subsistence crop for low income families with a lot economic benefits. According to FAO (1999), cassava provides a high level of carbohydrate and it is tolerant to drought with the ability to grow in poor soil. Also, the stem of cassava is used for plant propagation while the roots and leaves are processed for consumption. Apart from being a staple food crop, cassava can be processed into many products, thus, providing employment, generating income to farmers, processors and human beings in general.

In Nigeria, the production and consumption of cassava varies according to ecological zones. In the south-west zone, it is processed into garri, lafun, fufu, tapioca; in the south-south zone, it is consumed as garri, fufu and akpu; North-central – garri, fufu, and starch and in the North east – fufu, garri and abacha. Cassava can also be processed into Farinha in Latin America which is used as an ingredient in many recipes and used in the making of cassava bread or in the replacement of up to 10% wheat flour in the conventional bread. Cassava processing activities has served as a means of income generation and helped in improving the economic status and social lifestyle of the rural dwellers. The peels of cassava root and the leaves contain slightly more protein than the flesh (Nigeria National report, 2006).

In earlier times, women were not thought of as being important in the area of performing significant tasks besides their duties as housewives even though they were economically active (Olawoye, 1991). In cassava processing, various roles and responsibilities are assigned to adult males, adult females, younger males and younger females. Gender is a term used in the social science analysis to look at the roles and activities of men and women (IITA, 1996). Gender division of labour provides the underlying principle for separating and differentiating the work men and women do. It provides the rationale for the difference in value placed on work. This brings about the concept of gender division of labour in cassava processing activities which this study is based.

In Ogun state, both men and women are involved in cassava processing activities performing different roles. However, several literatures abound in cassava production and processing but there is lack of in-depth information in the specific roles performed and constraints faced by adult males, adult females, younger males and younger females in cassava processing in the study area. This study therefore, assessed gender roles in cassava processing activities in Ogun State.

The objectives were to:

- Examine the personal characteristics of cassava processors in the study area.
- Determine the level of involvement of adult males and females, younger males and females in cassava processing activities in the study area.
- Assess the sources of information on cassava processing activities available to the processors in the study area.
- Ascertain the constraints faced by adult males and females, younger males and female cassava processors in the study area.

METHODOLOGY

The study area was Ogun state which is one of the six states in the south-western part of Nigeria. It has a population of about 3,751,140 (NPC, 2006).The main livelihood activities of the inhabitants of the area include farming and trading. Crop farming is ranked highest which makes the area one of the best in food production. The study population comprises of all adult males, adult females, younger males and younger females involved in cassava processing activities in Ogun State. Multi- stage sampling technique was used to select respondents for the study. Two local government areas (Ewekoro and Odeda) were purposively selected out of the twenty local government areas because of the intensity of cassava processing activities in the area. Two wards from Ewekoro (Wasimi and Awowo) and Odeda (Olugbo and Opeji) were also purposively selected because of their high involvement in cassava processing activities. Snow ball technique was used to generate list of cassava processors and all the adult males (38) adult females (87) younger males (9) and younger females (16) processors formed the sample size of 150 respondents. Data for the study was collected with the use of a structured interview schedule. Major variable (level of involvement in cassava processing) was measured by using a four point scale of not involved, rarely involved, occasionally involved and always involved, with values of 0, 1, 2 and 3 respectively. Descriptive statistics were used to analyse the data.

RESULTS AND DISCUSSION

Respondents' personal characteristics

Table 1 shows that 84.2% of the adult males were between 31 – 50 years of age, while 82.8% were adult females. This result implies that middle aged people are more involved in cassava processing than the young and old people. This finding is in conformity with the report of Ekong (2003) and Jibowo (2000) which stated that most Nigerian farmers are between the ages of 45-50 years; Oyesola (2000) also reported that young adults who fall between the active labour force years are capable of undertaking income generating activities that are labour intensive. Also 81.6% of the adult males and 78.2% of the adult females were married. This shows that most of the respondents are married. Marital status is therefore an important factor to be considered in any programme of change to be introduced to the study area. Eighteen percent of adult males and 17.2% of adult females have non-formal education, while 88.9% of young male and 87.5% of young female have secondary education. This result shows that most of the adult males, females, younger males and females are educated. This high level of education could enhance their productivity. Also half of adult males, 48.3% of adult females, 66.7% of young males and 56.3% of young females use hired labour, hence most of the processors are using hired labour. This may increase their processing capability but increase their cost of production. The result also shows that 71.1% of adult males had farm sizes of (1-3acres), 23.6% had more than 7 acres, and 78.2% of adult females had farm sizes of (1-3 acres) while young female had no cassava farm. This implies that males have larger farm size than females which could be due to the fact that more females are involved in cassava processing activities.

Table 1
Distribution of respondents' personal characteristics

Personal characteristics	Adult Male		Adult Female		Young Male		Young Female	
Age	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
≤30	0	0.0	0	0.0	9	100.0	16	100.0
31-40	22	57.9	42	48.3	0	0.0	0	0.0
41-50	10	26.3	30	34.5	0	0.0	0	0.0
51-60	6	15.8	13	14.9	0.	0.0	0	0.0
61-70	0	0.0	2	2.3	0	0.0	0	0.0
Marital status								
Single	13	14.9	6	6.9	9	100.0	15	93.7
Married	71	81.6	68	78.2	0	0.0	1	6.3
Divorced	3	3.5	4	4.6	0	0.0	0	0.0
Widowed	0	0.0	9	10.3	0	0.0	0	0.0
Educational qualification								
Non formal	7	18.4	15	17.2	1	11.1	0	0.0
Primary	20	52.6	54	62.1	0	0.0	1	6.3
Secondary	9	23.7	14	16.1	8	88.9	14	87.5
Tertiary	2	5.3	4	4.6	0	0.0	1	6.2
Sources of labour								
Family	5	13.2	21	24.1	3	33.3	5	31.2
Hired	19	50.0	42	48.3	6	66.7	9	56.3
Cooperative	1	2.6	1	1.2	0	0.0	0	0.0
Family and Hired	7	18.4	21	24.1	0	0.0	2	12.5
Family and cooperative	6	15.8	2	2.3	0	0.0	0	0.0
Farm size								
1-3 acres	27	71.1	68	78.2	8	88.9	0	0,0
4-6 acres	2	5.3	17	19.5	1	11.1	0	0.0
≥7 acres	9	23.6	2	2.3	0	0.0	0	0.0

Sources of information on cassava processing

Table 2 reveals that 79.0%of the adult males, 92.0% of the adult females, 89.9% of the young males and 81.0% of young females got their information always through friends. This indicates that most of the respondents get information on cassava processing through friends, which could be as a result of their regular interaction with people on a daily basis. The result also shows that adult male (50.0%), adult female (69.0%), young male (56.0%) and young female (63.0%) always got information on cassava processing activities through market which is an indication that they regularly visit market to sell or make inquiring about their products. However, majority of adult female (65.5%), young male (56.0%) and young female (63.0%) occasionally got information on cassava processing through radio and this means that women in particular prefer to source for information through informal sources as they do not have much time to listen to radio as a result of many house chores.

Table 2
Distribution of respondents based on their source of Information

Sources	Sex	Always	Occasionally	Rarely	Never	Total
		Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Friends	Adult male	30 (79.0)	7 (18.4)	0 (0.00)	1 (3.0)	
	Adult female	80 (92.0)	6 (7.0)	0 (0.00)	1 (1.0)	
	Young male	8 (89.0)	1 (11.0)	0 (0.00)	0 (0.00)	9 (100)
	Young female	13 (81.0)	2 (13.0)	0 (0.00)	1 (6.0)	
Radio	Adult male	6 (16.0)	18 (47.4)	7 (18.4)	7 (18.4)	
	Adult female	7 (8.0)	57 (65.5)	18 (20.7)	5 (5.9)	
	Young male	1 (11.0)	5 (56.0)	1 (11.0)	2 (22.2)	9 (100)
	Young female	1 (6.3)	10 (63.0)	1 (6.3)	4 (25.0)	
Market	Adult male	19 (50.0)	12 (31.6)	1 (2.6)	6 (16.0)	
	Adult female	60 (69.0)	15 (17.2)	5 (6.0)	7 (8.0)	
	Young male	5 (56.0)	2 (22.2)	1 (11.0)	1 (11.0)	9 (100)
	Young female	10 (63.0)	2 (12.5)	1 (6.3)	3 (19.0)	
Television	Adult male	0 (0.00)	16 (42.0)	1 (28.9)	11 (29.0)	
	Adult female	5 (6.0)	34 (39.1)	36 (41.0)	12 (14.0)	
	Young male	1 (11.0)	5 (56.0)	1 (11.0)	2 (22.0)	9 (100)
	Young female	1 (6.3)	8 (50.6)	3 (1.9)	4 (25.0)	
Extension agents	Adult male	0 (0.00)	2 (5.0)	17 (45.0)	19 (50.0)	
	Adult female	0 (0.00)	11 (12.0)	33 (38.0)	43 (50.0)	
	Young male	0 (0.00)	1 (11.0)	5 (56.0)	3 (33.0)	9 (100)
	Young female	0 (0.00)	1 (6.3)	7 (43.7)	8 (50.0)	

Constraints faced by the respondents

Table 3 reveals that 42.0% of adult males, 44.0% adult females and 43.0% of young females had inadequate credit facility as a serious constraint. The result also shows that adult male (53.0%), adult female (62.0%), young male (78.0%) and young female (75.0%) had inadequate transport system as mild constraint. Also adult male (61.0%), adult female (76.0%), young male (67.0%) and young female (75.0%) had lack of close market as mild constraint. This indicates that these categories of respondents indicated inadequate credit facilities alone as the most serious problem while others are indicated as mild. This is consistent with the report of Muhammad-Lawal*et al*(2013) where inadequate capital was seen as the most serious problem among cassava processors. This implies that other constraints are not likely to hinder processors from engaging in processing activities.

Table 3
Distribution of respondents according to constraints

Constraints	Adult male Frequency (%)	Adult female Frequency (%)	Young male Frequency (%)	Young female Frequency (%)
Lack of storage facilities				
Not a constraint	19 (50.0)	32 (37.0)	6 (67.0)	11 (69.0)
Mild constraint	11 (29.0)	42 (48.0)	3 (33.0)	9 (25.0)
Severe constraint	6 (16.0)	10 (12.2)	0 (0.00)	1 (6.0)
Very severe constraint	2 (5.0)	3 (3.0)	0 (0.00)	0 (0.00)
Inadequate information				
Not a constraint	13 (34.0)	24 (28.0)	6 (67.0)	9 (56.0)
Mild constraint	20 (53.0)	51 (59.0)	3 (33.0)	7 (44.0)
Severe constraint	3 (8.0)	10 (12.0)	0 (0.00)	0 (0.00)
Very severe constraint	2 (5.0)	2 (2.0)	0 (0.00)	0 (0.00)
Inadequate credit facility				
Not a constraint	5 (13.0)	4 (5.0)	0 (0.00)	2 (13.0)
Mild constraint	12 (32.0)	28 (32.0)	7 (78.0)	6 (38.0)
Severe constraint	16 (42.0)	38 (44.0)	2 (22.0)	7 (43.0)
Very severe constraint	5 (13.0)	17 (20.0)	0 (0.00)	1 (6.0)
Lack of contact with extension agent				
Not a constraint	13 (34.0)	22 (25.0)	3 (33.0)	8 (50.0)
Mild constraint	7 (18.0)	16 (18.0)	3 (33.0)	5 (31.0)
Severe constraint	12 (32.0)	31 (36.0)	3 (33.0)	3 (19.0)
Very severe constraint	6 (16.0)	18 (21.0)	0 (0.00)	0 (0.00)
Inadequate transport system				
Not a constraint	5 (13.0)	4 (5.0)	0 (0.00)	3 (19.0)
Mild constraint	20 (53.0)	54 (62.0)	7 (78.0)	12 (75.0)
Severe constraint	12 (32.0)	24 (28.0)	2 (22.0)	1 (6.3)
Very severe constraint	1 (2.6)	5 (6.0)	0 (0.00)	0 (0.00)
Lack of close market				
Not a constraint	8 (21.0)	7 (8.0)	1 (11.0)	3 (19.0)
Mild constraint	23 (61.0)	66 (76.0)	6 (67.0)	12 (75.0)
Severe constraint	6 (16.0)	12 (14.0)	2 (22.0)	1 (6.0)
Very severe constraint	1 (3.0)	2 (2.0)	0 (0.00)	0 (0.00)
Labour				
Not a constraint	6 (16.0)	13 (15.0)	1 (11.0)	2 (12.0)
Mild constraint	17 (45.0)	38 (44.0)	7 (78.0)	7 (44.0)
Severe constraint	13 (34.0)	35 (40.0)	0 (0.00)	7 (44.0)
Very severe constraint	2 (53.0)	1 (1.1)	1 (11.0)	0 (0.00)

Level of involvement in cassava processing activities

Table 4 reveals that most of the respondents (87.0%) who took part in uprooting of cassava tubers were adult males. This could be as a result of the adult males being more energetic than the other respondents within the group. All young males (100%) were also involved in carriage activities; which could be as a result of role distribution among household members. Eighty- nine percent and 87.0% of adult females were involved in cassava peeling and washing respectively, while 90.0% of the young males were involved in milling activities. Fifty-eight percent of adult females were involved in dehydrating, 88.0% of the young females were involved in sifting and sieving, 85% of adult females were involved in frying, while 100% of young females were involved in washing of tools. This finding is in line with Ogunleye*et al* (2008) who reported that female were mostly involved in peeling, frying and drying of cassava than their male counterpart. Eighty-eight percent of young females took active part in the dumping of peels at dump site, 94.0% of young females sweep the area, 75.0% of the young females were involved in the sales at process point, while 78.0% of the adult males were involved in packaging. This study shows that adult males and females, young males and females are

involved in different roles in cassava processing activities depending on their capabilities.

Table 4

Distribution of respondents by level of involvement in cassava processing activities

Activities GARRI	Adult male Freq.(%)	Adult female Freq.(%)	Young male Freq.(%)	Young female Freq.(%)
Uprooting of cassava tubers				
Always	33 (87.0)	16 (18.0)	7 (78.0)	1 (6.3)
Occasionally	2 (5.0)	33 (38.0)	1 (11.0)	5 (31.0)
Rarely	1 (2.6)	11 (13.0)	1 (11.0)	1 (6.3)
Not involved	2 (50.0)	27 (31.0)	0 (0.00)	9 (56.0)
Carriage				
Always	23 (61.0)	45 (52.0)		10 (63.0)
Occasionally	12 (32.0)	14 (16.0)	0 (0.00)	3 (19.0)
Rarely	1 (3.0)	23 (26.0)	0 (0.00)	0 (0.00)
Not involved	2 (5.0)	5 (6.0)	0 (0.00)	3 (19.0)
Peeling				
Always	12 (32.0)	77 (89.0)	4 (44.0)	14 (88.0)
Occasionally	16 (42.0)	7 (8.0)	4 (44.0)	1 (6.0)
Rarely	5 (13.2)	2 (2.0)	1 (11.0)	1 (6.0)
Not involved	5 (13.2)	1 (1.0)	0 (0.00)	0 (0.00)
Washing				
Always	6 (16.0)	72 (83.0)	5 (56.0)	14 (87.5)
Occasionally	8 (21.0)	11 (13.0)	1 (11.0)	1 (6.0)
Rarely	16 (42.0)	2 (2.0)	3 (33.0)	0 (0.00)
Not involved	8 (21.0)	2 (2.0)	0 (0.00)	1 (6.0)
Milling/Grating				
Always	21 (55.0)	19 (22.0)	8 (90.0)	4 (25.0)
Occasionally	12 (32.0)	31 (35.0)	0 (0.00)	5 (31.0)
Rarely	2 (5.0)	30 (35.0)	1 (11.0)	4 (25.0)
Not involved	3 (8.0)	7 (8.0)	0 (0.00)	3 (19.0)
Dehydrating				
Always	20 (53.0)	50 (58.0)	5 (56.0)	7 (44.0)
Occasionally	7 (18.0)	25 (29.0)	1 (11.0)	5 (31.0)
Rarely	4 (11.0)	7 (8.0)	2 (22.0)	1 (6.0)
Not involved	7 (18.0)	5 (6.0)	1 (11.0)	3 (19.0)
Sifting				
Always	5 (13.2)	71 (82.0)	2 (22.0)	14 (88.0)
Occasionally	9 (24.0)	11 (13.0)	3 (33.0)	2 (13.0)
Rarely	11 (29.0)	2 (2.0)	2 (22.0)	0 (0.00)
Not involved	13 (34.2)	3 (3.0)	2 (22.0)	0 (0.00)
Total				
Sieving				
Always	5 (13.2)	76 (87.0)	2 (22.0)	14 (88.0)
Occasionally	4 (11.0)	10 (12.0)	3 (33.0)	2 (13.0)
Rarely	13 (34.0)	1 (1.0)	2 (22.0)	0 (0.00)
Not involved	16 (42.0)	0 (0.00)	2 (22.0)	0 (0.00)
Frying				
Always	5 (13.0)	74 (85.0)	1 (11.0)	13 (81.0)
Occasionally	8 (21.0)	6 (7.0)	3 (33.0)	2 (13.0)
Rarely	7 (18.0)	3 (3.0)	3 (33.0)	1 (6.0)
Not involved	18 (47.0)	4 (5.0)	2 (22.0)	0 (0.00)
Washing of tools				
Always	3 (8.0)	38 (44.0)	3 (33.0)	
Occasionally	10 (26.6)	29 (33.0)	3 (33.0)	0 (0.00)
Rarely	11 (29.0)	16 (18.0)	2 (22.0)	0 (0.00)
Not involved	14 (37.0)	4 (5.0)	1 (11.0)	0 (0.00)
Dumping of peels at dump point				
Always	6 (16.0)	38 (44.0)	5 (56.0)	14 (88.0)
Occasionally	8 (21.0)	26 (30.0)	3 (33.0)	2 (13.0)
Rarely	12 (32.0)	20 (23.0)	1 (11.0)	0 (0.00)
Not involved	12 (32.0)	3 (3.0)	0 (0.00)	0 (0.00)
Sweeping the oven				
Always	2 (50.0)	39 (45.0)	5 (56.0)	15 (94.0)
Occasionally	4 (11.0)	29 (34.0)	0 (0.00)	1 (6.0)
Rarely	18 (47.0)	16 (18.0)	2 (22.0)	0 (0.00)
Not involved	14 (37.0)	3 (3.0)	2 (22.0)	0 (0.00)
Sales at process point				
Always	7 (18.0)	64 (74.0)	6 (67.0)	12 (75.0)
Occasionally	15 (40.0)	18 (21.0)	3 (33.0)	2 (13.0)
Rarely	7 (18.4)	2 (2.0)	0 (0.00)	2 (13.0)
Not involved	9 (24.0)	3 (3.0)	0 (0.00)	0 (0.00)
Packaging				
Always	14 (37.0)	63 (72.0)	7 (78.0)	11 (69.0)
Occasionally	11 (29.0)	20 (23.0)	2 (22.0)	4 (25.0)
Rarely	4 (11.0)	3 (3.0)	0 (0.00)	0 (0.00)
Not involved	9 (24.0)	1 (1.0)	0 (0.00)	1 (6.0)

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, it can be concluded that more females participate in most of the activities in cassava processing. More women were involved in peeling; washing, soaking and frying while the males were mostly involved in the uprooting of the tubers, carriage of the tuber and milling activities. This shows that specific roles are performed along gender line; hence there are gender related tasks in cassava processing activities.

Based on this study, the following recommendations were made:

1. There should be collection of sex disaggregated information in the decision making process as it provides quality information on gender differences and inequalities.
2. An effective job-related training is important for both males and females. This is because majority of them are farmers. Agricultural extension is the means of providing such training. This will ensure that agricultural productivity is increased and agricultural production will also be sustainable.

REFERENCES

Ekong, E. E.(2003)An introduction to rural sociology Ibadan Jumark Publisher Limited 312pp

Food and Agricultural Organization (FAO) 1999. Urban Food supply and Distribution policy in Developing countries. A concept paper; Inter-regional program on Food Supply and distribution of cities, pp 20-23

International Institute of Tropical Agriculture (1996)*Cassava in Tropical Africa–A Reference Manual*. IITA, Ibadan, Nigeria, pp 83-95.

Jibowo, A. (2000) Essentials of rural sociology GbemiSodipe Press Ltd Abeokuta,Nigeria.Pp89-122.

Muhammad-Lawal A, Omotesho O. A and Oyedemi F. A. (2013)An assessment of the economics of cassava processing in Kwara State, Nigeria. Being an Invited Paper Presented at the 4th International Conference of the African Association of Agricultural Economists, September 20-22, Hammamet, Tunisia. Accessed 9 December, 2014 from ageconsearch.umn.edu/bitstream/

Nweke, F.I. andEnete, A. A. (1999) Gender surprises in food production, processing and marketing with emphasis on cassava in Africa. *COSCA Working Paper* no 19. Collaborative study of cassava in Africa, IITA Ibadan Nigeria.

Nigeria Population Commission (2006) Population and housing census. Retrieved 29 June 2013 from http://www.population.gov.ng/2006_final_results/ogunfinal.pdf

Nigeria National Report (2006) A Report presented at international conference on agrarian reform and Rural Development. Porto Alegre,7-10th March.

Ogunleye, K. Y, Adeola, R. G. and Ibigbami, I. O (2008) Gender roles in cassava processing activities among processors in Ogo-OluwaLocal Government Area of Oyo State. *International Journal of Agricultural Economics and Rural Development* Vol. 1 No.1 pp 30-37

Oyesola,O.B. 2000:Training needs for improving income generating Activities of Agro pastoral women in Ogun State, Nigeria. Unpublished Ph.D. thesis, Department of Agricultural Extension and Rural Development, University of Ibadan,Ibadan,Nigeria,Pp.236

Sesame Farmers' Access to Intervention Input in Batsari Local Government Area of Katsina State, Nigeria

Ikwuakam, O.T. and Lawal M.
Federal College of Education, Katsina, Katsina State, Nigeria
Corresponding Author: E-mail: ikwuosca@yahoo.com

ABSTRACT

Sesame (Sesamum indicum) commonly called beniseed in Nigeria is an important oilseed crop that has wide range of uses within and outside Nigeria. Dearth of information on farmers' access to intervention input is a serious concern. The study therefore determined sesame farmers' access to intervention input in Batsari Local Government Area (LGA) of Katsina state. Systematic sampling technique was used to select a total of 90 sesame farmers and Information was collected using interview schedule. Inferential and descriptive statistics were used for data analysis. Most respondents (47.8%) were within 31-40 years, 61.1% married, all (100%) were both males and Muslims while 50.0% had Quranic education. Also 56.7% had 1-10 years of farming experience, 51.1% had 4-6ha of farm size and 37.8% earned > #500,000 per annum. Majority (75.6% and 71.1%) sourced information from radio and association members respectively. Improved seeds ($\bar{x}$ = 107.7), marketing outlets ($\bar{x}$ = 112.3) and workshop training ($\bar{x}$ = 102.3) ranked 1st, 2nd and 3rd respectively among few input respondents accessed. Extension workers ($\bar{x}$= 64.5) also ranked first as constraints followed by time of intervention with $\bar{x}$ (43.3). Significant correlation exists between age (r = -0235), income (r = -0.364), constraints (r = 0.026) and respondents' access to intervention inputs.It is concluded thatsesame farmers have limited access to input.

Keyword: Access, input, constraints, sesame

INTRODUCTION

Sesame (*Sesamum indicum*) also known as beniseed in Nigeria is a plant family of *Pedaliacea*. It is an important oilseed crop that originated from tropical Africa from where it spread to India (Purseglove, 1996). It is called "simsim" in East Africa, "Till" in India and "Gingely" in Sri-Lanka. In Nigeria, sesame is called "Ridi" in Hausa, "Ekuku" in Ibo and "Isasa" in Yoruba. Sesame is an important crop to Nigerian agriculture and economy that is extensively and yields well in relatively poor climatic conditions. The total world cultivated area under sesame is reported to be about 6 million hecare. Sixty-six percent of this is concentrated in Asia, 8% in America, Venezuela, Mexico, Guatemala and Columbia) (FIIR, 1990), 25% in Africa (mainly Nigeria, Ethiopia and Sudan, Kenya, Niger, Egypt, Mali, Burkina Faso, Tanzania and Chad) (RMRDC, 2004). Global production of sesame is put at 3.84 million metric tons annually having risen from 1.4 million metric tones in the early 1960s (FAO 2010). On the other hand, whereas leading world producer's are India, China, Mexico and Sudan, Nigeria in Africa is second largest producer of sesame and ranks seventh in the World, with an estimated production of 120,000 metric tones annually (RMRDC, 2004).

In the same vein, sesame seed is mostly produced in Northern states of the federation namely: Benue, Taraba, Kebbi, Kano, Bauchi, Kogi, Plateau, Adamawa, Kwara, Niger, Gombe, Katsina, Yobe, Bomo and Nassarawa with the latter being the leading producer in Nigeria. It is reported that sesame is used within Nigeria and constitutes an important component of Nigeria's agricultural exports RMRDC (2004). According to RMRDC (2004) Nigeria realized a sum of 150 million dollars from sesame during the 2004-2005 cropping season with the country's export market increasing progressively with the entrance of China and South Korea, Japan, Turkey, Iran and Europe. RMRDC, (2004) further estimated national production to be about 300,000 metric tonnes annually with about 60-70% of this exported annually. This according to RMRDC, (2004) places the crop as the second largest non-oil export in Nigeria.

Although, industrial processing and utilization of sesame have not been fully developed in Nigeria, sesame is locally processed and utilized in various forms especially in the states where the crop is cultivated. Its oil can be extracted from the

seed and the cake made into kulikuli which together with the leaves are used to prepare local soup known as 'miyar taushe'. The oil is also used locally for cooking as well as for medicinal purposes such as the treatment of ulcers and burns. The stem and the oil extract are equally used in making local soap. According to Mshelia, Sajo and Gungula (2012) the dried stems of sesame can be burnt to ashes, dissolved in water, stored and allowed to settle and the filtrate used in soap making by rural women to generate income

Internationally, sesame seed is the most sought after vegetable oil as its industrial ingredients is good for the production of margarine, canned sardine, corned beef, soap and ink (Sankar, Ali, Sambandam and Rao, 2010). In Greece, a paste of ground sesame seeds is reportedly used for tahini preparation. Sankar et *al* further pointed out that in northern Europe, sesame is commonly used as a bakery product and is particularly popular in Germany and the Netherlands either within breads or on the surface of bread and breadsticks as a garnish. Also sesame is well preferred to other vegetable oils because of its good chemical composition (rancid-resistant) colour, taste and lack of odour. Sankar et *al* maintains that sesame seeds are not only praised for their fabulous nutritional profile but are highly valued for their capabilities in fighting, preventing, and reversing illness and disease.

However, it has been observed that due to the importance of sesame to national economy development, series of intervention input were made available by both Government and private sector to boost farmers' production capacity. Nigeria Agricultural and Rural Development Bank (NARDB) and Olam (a subsidiary of Olam International Limited) are the front runners in providing support services to sesame farmers in Nigeria (Mshelia *et al* 2012). These input among others include giving credit in kind and buying output from debtor farmers, supplying production input such as fertilizer and hybrid seeds.

It is obvious that the economics of interventions input allocation in any agricultural activity especially at the micro level is to assist farmers attain improved productivity. However, efficient allocation of the input in this context is dependent on farmers' accessibility to them. In other words, an increase in agricultural production and sesame in particular is difficult without adequate access to relevant input. Incidentally, Amaza and Maurice (2005) have observed a marked deterioration in the productivity of overall Nigeria's agriculture. One of the factors attributed to the declining productivity of the sector is farmers' limited access to resources (Manyong, Olayemi, Yusuf, Omonona, Okoruwa, Idachaba, 2005).It is in this light that the study investigated sesame farmers' access to intervention input in Katsina state. The specific objectives were to:

1. examine selected socio-economic characteristics of sesame farmers
2. determine accessibility of sesame farmers to intervention input
3. ascertain constraints to sesame farmers' access to intervention input

METHODOLOGY

The study was carried out in Batsari Local Government Area (LGA) of Katsina State. It is one of the 34 LGAs in Katsina state and has 123 villages. Purposive sampling technique was employed in selecting nine villages namely; Ruma, Yandaka, Kandawa, Kurmiyal, Wagini, Kasai, Tashar Nagulle, Salihawa and Yauyau basically because of the intensity of sesame farming in the communities. Using systematic sampling technique 10 sesame farmers were selected from the lists of registered sesame farmers in each community to give a sample size of 90 sesame farmers used for the study.Data on socio-economic, source of information, access to intervention input and constraints to access were collected with the aid of interview schedule.

The dependent variable (i.e. access to intervention input) was measured on 4-point scale of always, occasionally, rarely, never and was scored 3, 2, 1, and 0 respectively. The mean access to intervention input was obtained and used to categorize sesame farmers' level of access into high (> mean score) and low (< mean score). Frequency counts, percentages and means were used to describe the data, while Chi Square and PPMC were used to test hypothesis.

RESULTS AND DISCUSSION

Socio-economic characteristics of sesame farmers

The result in Table 1 shows that most respondents (47.8%) were within the age range of 31-40 years. This means that the respondents are young and full of strength to carry out farming activities. This has implication also on sustainability of sesame farming and respondents' vibrancy in sourcing and having access to input. This corroborates the finding of Ewebiyi, Sangotegbe and Ikwuakam (2012) that women farmers in Odeda LGA area of Oyo state. Majority (61.1%) were single. This is very unusual of typical Hausa community as early marriage is a common practice. The result implies that the respondents may rely on other sources of labour for farming activities. The result contradicts the finding of Olukotun, Oseke, Fadele and Babalola (2012) that most maize farmers in Zoba LGA were married. The result further reveals that all (100%) of the respondents were Muslims with 50% having Quranic education. This implies that most of them could only read Arabic language

and may find it difficult to read or have access to agricultural information, programmes, resources and innovation whose instructions are written or conducted in English Language. The finding is in line with Babalola, Okoruwa, Omonona and Oni (2013) who found out that most sugarcane farmers had Quranic education. All (100%) respondents were males. This shows that sesame farming in the area though not gender exclusive is predominantly a male affair. This means that farmers may not have cultural restrictions in sourcing and having access to input. The mean years of experience of most respondents (57.0%) was 14 years. This means that sesame farmers are experienced and this may enhance their access to input. Result further reveals that 37.8% of respondents earned above ₦500, 000 = 00 annually from sesame. This implies that sesame farmers are high income earners. The result contradicts Odoemenem and Otanwa (2011) finding that cassava farmers earn less than ₦300, 000 annually in Benue state, Nigeria. Majority (46.0%) cultivated between 4-6 hectares of land. This indicates the level of importance attached to sesame crop in the area. Sesame Farmers' sources of labour were mostly paid/hired (67.8%) and self (33.3%). The respondents' marital status (single) could be a reason for their emphasis on both hired and self sources of labour. The finding is in line with Obibuaku (1999) who reported preference for paid/hired and self labour in south eastern, Nigeria.

Table 1
Socio-economic characteristics of respondents

Variable	Frequency	Percentage	Mean
Age			
31-40	43	47.8	**39.6778±10.15258**
41-50	23	25.6	
51-60	10	11.1	
above 60	3	3.3	
Marital status			
Married	35	38.9	
Single	55	61.1	
Religion			
Islam	90	100.0	
Education			
Quranic	46	51.1	
Primary	16	17.8	
Secondary	22	24.4	
Tertiary	6	6.7	
Sex			
Male	90	100.0	
Female	0	0.00	
Years of Experience			**13.4889±11.71789**
1-10	51	56.7	
11-20	28	31.1	
21-30	6	6.7	
31-40	2	2.2	
51-60	3	3.3	
Farm size in ha			**8.2444±9.66903**
1-3	19	21.1	
4-6	46	51.1	
7-9	6	6.7	
10-12	4	4.4	
above 12	15	16.7	**508322.20±377669.37**
Income			
< 200,000=00	26	28.9	
200,001 = 300,000	8	8.9	
300,001 = 400,000	4	4.4	
400,001 = 500,000	18	20.0	
> 500,000 = 00	34	37.8	
Labour source			
Self	30	33.3	
Family	20	22.2	
Hired	61	67.8	
Friends	12	13.3	

Sources of information on intervention input

Table 2 is a presentation of the various sources of information available to sesame farmers. The result reveals that radio (75.6%), farmer association members (71.1%), neighbors (65.5%), NGOs (57.8%) and mosque (55.6%)

constituted major sources of information to most sesame farmers. The result is an indication that radio is widely used than other sources of information. However, the relatively high percentage of farmers' association members, extension agents, neighbors as well as NGOs and mosque shows that they are also utilized. This revelation is in consonance with Ugwoke, Mathews-Njoku, Anaeto and Okereke (2009) who among others identified radio as being used to a large extent in receiving agricultural information by farmers in Imo state, Nigeria.

Table 2
Sources of information on intervention input

Variable	F	%	Rank
Extension agents	16	17.8	7th
Radio	68	75.6	1st
Television	16	17.8	7th
Friends	16	17.8	7th
Neighbours	59	65.6	3rd
NGO	52	57.8	5th
Newspapers	12	13.3	8th
Association members	64	71.1	2nd
Church	5	5.6	9th
Mosque	50	55.6	6th

Access to intervention inputs

The result on access to intervention inputs reveals that majority of the respondents had no access to labour (94.4%, tractor services (90.0%), processing equipment (85.6%), loan 84.4% land (67.8%) and herbicides (66.7%). However, farmers had access to input like extension services (65.6%), improved seeds (61.1%) and training workshop (51.1%) on occasional basis. This implies that very few farmers had access to intervention input for sesame production in the area. Although, from the weighted scores access to improved seeds (107.7) ranked first among few input that farmers accessed followed by marketing outlet (112.3). This is in line with Ewebiyi *et al* (2012) who found out that very few women farmers had access to production resources in Odeda Local Government Area of Ogun state, Nigeria.

Table 3
Distribution of respondents based on access to intervention input

Variable	Always		Occasionally		Not at all		Weighted score	Rank
	F	%	F	%	F	%		
Improved seeds	21	23.3	55	61.1	14	15.6	107.7	1st
Marketing outlet	32	35.6	37	41.1	21	23.3	112.3	2nd
Herbicides	11	12.2	19	21.1	60	66.7	45.5	6th
Farm land	9	10.0	20	22.2	61	67.8	42.2	7th
Loan	6	6.7	8	8.9	76	84.4	22.3	8th
Labour	0	0.00	5	5.6	85	94.4	5.6	12th
Tractor services	3	3.3	6	6.7	81	90.0	13.3	10th
Extension services	10	11.1	59	65.6	21	23.3	87.8	4th
Workshop training	23	25.6	46	51.1	21	23.3	102.3	3rd
Processing equipment	3	3.3	10	11.1	77	85.6	17.7	9th
Processing centres	3	3.3	5	5.6	82	91.1	12.2	11th
Feeder roads	0	0.00	0	0.00	90	100	0.00	13th
Storage facilities	0	0.00	0	0.00	90	100	0.00	13th
Rodenticide	0	0.00	0	0.00	90	100	0.00	13th
Insecticide	0	0.00	0	0.00	90	100	0.00	13th
Fertilizer	17	18.9	43	47.8	30	33.3	85.6	5th

Level of access to intervention input among sesame farmers

The result as shown in Table 4 reveals that 52.2% of sesame farmers had low level of access to intervention input. This means that their production will be adversely affected. The result is in tandem with International Fund for Agricultural Development (IFAD) (2001) who observed that low access to intervention input is a common phenomenon in Nigeria and a common factor that limit production, processing and marketing of agricultural commodities among peasants farm holdings.

Table 4
Distribution of respondents based on level of access to intervention input among sesame farmers

Category	Range of scores	F	Percent	Mean	SD
Low	0-6	47	52.2	6.5444	3.29849
High	6.54-15	43	47.8		

Constraints to sesame farmers' access to intervention input

The study identified few constraints to sesame farmers' access to intervention input. Using weighted scores, lack of extension workers contact (64.5) and time of intervention (64.5) ranked 1st among factors that constrained sesame farmers' access to intervention input. The result supports the finding of Deji, Adereti and Ilori (2005) that low rate of extension agents contacts is one of the factors limiting farmers' access to agricultural production resources in Ogun state.

Table 5
Constraints to sesame farmers' access intervention input

Variable	Serious		Mild		Not a constraint		Weighted score	Rank
	F	%	F	%	F	%		
Lack of Extension workers	15	16.7	28	31.1	47	52.2	64.5	1st
Sabotage	0	0.00	13	14.4	77	85.6	14.4	3rd
Bureaucracy	0	0.00	24	26.7	66	73.3	26.7	2rd
Language barrier	0	0.00	0	0.00	90	100.0	0.00	6th
Format of presentation	0	0.00	6	6.7	84	93.3	6.7	5th
Cost of transportation	0	0.00	12	13.3	78	86.7	13.3	4th
Time of intervention	15	16.7	28	31.1	47	52.2	64.5	1st

Respondents' socio-economic characteristics and their level of access to intervention input

The study shows that at 5 percent level of significance, there were significant relationships between sesame farmers' source of labour (self) (χ^2 = 10.777), friends (χ^2 = 2.668) and their access to intervention input in the area. This shows that both labour source (self) and friends influenced sesame farmers' access to intervention input in the study area.

The findings in Table 6 further shows that significant correlation exists between age (r = -0235), income (r = -0.364), constraints (r = 0.026) and sesame farmers' access to input. This means that age, income and constraints were sufficient enough to influence sesame farmers' access to inputs. The result also implies that the younger the respondents and more income derived the likelihood of their desire to explore various tactics and means of accessing input to enhance their production potentials as well as curtailing the constraints.

Table 6
Relationship between the socio-economic characteristics of sesame farmers and their access to intervention input

Variable	χ^2	Df	Decision	Variable	r-value	Decision
Marital status	0.306	1	NS	Age	-0235	S
Education	3.248	3	NS	Income	-0.364	S
Source of Labour:				Experience	-0.089	N
Self	10.777	1	S	Farm size	-0.124	N
Family	0.538	1	NS	Source of information	0.018	N
Hired	0.267	1	NS	Constraints	0.026	S
Friends	2.668	1	S			
Membership to Association	2.227	1	NS			

CONCLUSION

Most sesame farmers had access to improved seeds and marketing outlets. However, level of access to agricultural input among the respondents was low. Lack of extension agents' contact and time of intervention ranked first among factors that constituted constraints to sesame farmers. Self labour was significantly related with respondents' access to input. Also, age, income and constraints were significantly correlated with sesame farmers' access to input.

RECOMMENDATIONS

Appropriate number of extension agents should be deployed to the rural areas to facilitate sesame farmers' contact with them. This is germane in ensuring that good number of sesame farmers is offered extension services in their areas of needs.

Awareness creation is crucial in encouraging sesame farmers to join formidable cooperative associations.

This can increase their chances of accessing formal agricultural information that are relative to sesame farming. This also will be of benefit to most sesame farmers that cannot read and write in English Language and enlighten them on how to go about accessing available intervention input.

Delays in releasing approved input should be adequately addressed. This will further motivate farmers into seeking for such input to boost and improve their production capacity as well as income earning.

REFERENCES

Amaza P. S., Maurice D. C.(2005) Identification of factors that influence technical efficiency in rice-based production systems in Nigeria. Paper presented at Workshop on Policies and Strategies for Promoting Rice Production and Food Security in Sub-Saharan Africa:- November 2005, Cotonou (Benin), pp. 7-9.

Babalola .D. A, V. O. Okoruwa, B. T. Omonona and O. A. Oni (2013) Assessment of the influence of government intervention programme on sugarcane production in Nigeria: Evidence from Jigawa State *Journal of Research and Development* Vol. 1, No.1

Deji O.F, F.O Adereti and O.A Ilori (2005) Factors associated with accessibility of female headed households to selected agricultural production resources in Ogun State, Nigeria. *Nigeria Journal of Rural Sociology* Vol. 5 Nos 1 & 2 pp39

Ewebiyi,I.O, N.S. Sangotegbe and O.T. Ikwuakam (2012)Access to productive resources among women farmers in Odeda Local Government Area of Ogun State, Nigeria. *Nigeria Journal of Rural Sociology*Vol. 13, No 1.pp. 89-97.

Food and Agricultural Organisation (FAO) (2010) Key statistics of food and agriculture external trade. faostat database. accessed from <http://www.fao.org/es/ess/toptrade/trade.asp . on 12th July, 2014.

Federal Institute for Industrial Research (FIIR)(1990) Report on survey of selected agricultural raw material in Nigeria

International Fund for Agricultural Development (IFAD) (2001) Agriculture in the Federal Republic of Nigeria. Abuja: IFAD, pp.92

Manyong V. M., Ikpi A., Olayemi JK, Yusuf SA, Omonona BT, Okoruwa V, Idachaba F. S.(2005) Agriculture in Nigeria: Identifying opportunities for increased commercialization and investment. IITA, Ibadan, Nigeria. p. 159.

Mshelia, J. S.; A. A. Sajo and D.T. Gungula (2012) Sesame production as panacea for poverty alleviation in Nigeria. *Journal of Agriculture and Veterinary Sciences* Volume 4, pp19

National Population Commission (2007) Census Report. Abuja: NPC

Obibuaku, L.O. 1999:Agricultural extension as a strategy for rural transformation of Nigeria. University of Nigeria Nsukka Press, pp. 56

Odoemenem, I.U and L.B. Otanwa (2011)Economic analysis of cassava production in Benue State, Nigeria *Current ResearchJournal of Social Sciences* 3(5): pp. 406-411.

Olukotun, F.T, O.Oseke, P.O. Fadele and E.A.Babalola (2012) Sources and problems of obtaining credits facilities among small scale maize farmers in Soba Local Government Area, Kaduna. J.M. Jibin, M.A Hussaini, B.M Auwalu, E.U. Essiet. I.R. Muhammad, S.G. Mohammed, M.I. Daneji, Y. Garba and S.A. Pantami (eds) *Proceeding of the 46th annual Conference of Agricultural Society of Nigeria* 5th-9th November

Raw Materials Research and Development Council (RMRDC) (2004) Survey report of ten selected agro raw materials in Nigeria BENISEED (Maiden Edition). Raw materials Research and Development council Garki 108pp

Sankar D, Ali A, Sambandam G, Rao R. (2010)Sesame oil exhibits synergistic effect with anti-diabetic medication in patients with type 2 diabetes mellitus. *Clinical Nutrition* Vol. 3: pp 351-8

Ugwoke E.O, E.C Mathew-Njoku, E.C. Anaeto, C.F and Okereke E.N (2009) Socio-economic factors affecting farmers use of mass media agricultural programmes in Imo State, Nigeria. *Nigerian Journal of Rural Sociology* Vol. 9 No. 1

Effect of Incentives on Job Satisfaction of Academic and Non-Academic Employees of Selected Federal Colleges of Agriculture in Oyo State, Nigeria

***Adeogun, S.O., *Fapojuwo, E.O., Oyeyinka R.A. *Bolarinwa K.K.., and *Abiona B.G.**

*Department of Agricultural Administration, Federal University of Agriculture, Abeokuta Ogun State, Nigeria

Corresponding author's e-mail: stephendeog2007@gmail.com

ABSTRACT

The study compared the job satisfaction of academic and non-academic of Federal College of Animal Health Moor Plantation and Federal College of Forestry of Nigeria. The senior staffs (Contiss 8 and above) were chosen and stratified into two categories of teaching and non-teaching staffs. From these categories, 30 percent of these categories were selected for the study to arrive at 109 respondents using simple random sampling technique. Result shows that 65.9% of the respondents were male, 31.8% were Bachelors' degree holder, 72.9% of the respondents were married and 88.2% earned 1.3 million and above annually. There were significant difference between job satisfaction of academic and non-academic staff of the two institutions (F=2.57, p=0.01). Availability of incentives had great influence on the job satisfaction of both academic and non-academic staffs of the institutions (r = 0.07, p = 0.00). The study therefore recommended that Federal Agricultural Colleges in Nigeria should make provision for incentives needed to enhanceemployees' job satisfaction.

Keywords: Job satisfaction, Academics, Non-academics, Federal Colleges

INTRODUCTION

Job satisfaction of employees shows the way employees in an organisation feel about the job they do which could be negative or positive. The work environment is one of the factors which affect employees' job satisfaction either negatively or positively. Many authors have defined job satisfaction in various ways and also identified various factors affecting job satisfaction of employees in an organisation. Job satisfaction has been defined in several different ways but the most general way is to define it as an attitudinal variable (Narang and Dwidevi, 2010). Spector (1997) defines job satisfaction as how people feel about their jobs and different aspects of their jobs. It is the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs.

Hassan, Hassan, Ud Din and Naseem (2011) define job satisfaction as the positive or negative ways with which employees view their work and it is affected by both the internal and external environment of the organization. The internal and external environments determine the working environment and the work attitude of employees, which can also affect productivity either negatively or positively. Pravin and Kabir (2011) posited that job satisfaction describes how contented an individual is with his or her job. It is a relatively recent term since in previous centuries jobs available to a particular person were often predetermined by the occupation of that person's parent.

There are varieties of factors that can influence a person's level of job satisfaction. Some of these factors include the level of pay and benefits, the perceived fairness of the promotion system within a company, the quality of the working conditions, leadership and social relationships, the job itself (the variety of tasks involved), the interest and challenge the job generates, and the clarity of the job description/requirements (Pravin and Kabir, 2011). They also reported that job satisfaction is not the same as motivation, although it is clearly linked. Other influences on satisfaction include the management style and culture, employee involvement, empowerment and autonomous workgroups (Pravin and Kabir, 2011). In her own view, Anitha (2011) states that the employee is a back bone of every organization, without employee no work can be done. So employee's satisfaction is very important. Employees will be more satisfied if they get what they expect, job satisfaction relates to inner feelings of workers.

Role of incentive in organisational development

A dictionary definition of an incentive is 'something that motivates you to do something'. Incentives usually motivate people to do what they do. Before a man accepts to perform a task at a cost, he must have seen the financial or social benefits before agreeing to perform such task. An employee that would not normally put in extra efforts to exceed his target would do so if an incentive is attached to hard work and being able to exceed target. Incentives can be defined as the engines that drive productivity and high performance of employees in organisations. Heathfield (2014) defined incentive as an object, item of value, or desired action or event that spurs an employee to do more of whatever was encouraged by the employer through the chosen incentive. Incentives are of different types, some are financial in nature, some coercive, some moral while others are natural in nature. Heathfield (2014) identified four types of incentives as:

Compensation incentives: These may include items such as raises, bonuses, profit sharing, signing bonus, and stock options.

Recognition incentives: They include actions such as thanking employees, praising employees, presenting employees with a certificate of achievement, or announcing an accomplishment at a company meeting.

Rewards and incentives: These include items such as gifts, monetary rewards, service award, presents, gift and certificates. An additional example is employee referral awards that some companies use to encourage employees to refer job candidates.

Appreciation incentives: These also include such happenings as company parties and celebrations, company paid family activity events, ice cream socials, birthday celebrations, sporting events, paid group lunches, and sponsored sports teams.The contributions of academic and non-academic employees of educational institutions assist in the achievements of the institutional goals and objectives. The provision of incentives goes a long way to encourage employees, and greatly influences their job satisfaction.

Factor affecting job satisfaction

Many authors have identified different factors affecting job satisfaction; among such factors are work environment, relationship between bosses and subordinates, work attitude if employees, incentives and inducements availability, opportunities for personal development among others.

Hodson (1996) posited that opportunity for meaningful input into decision making process affects job satisfaction. It was found that service conditions (Bajpai and Srivastava 2004), organisation culture Mckinnon, J.L. Harrison, G.L. Chow, C.W. and Wu, A. (2003), perception of fairness in the company's compensation programme (Babakus, E., Cravens, D.W., Grant, K., Ingram, T.N. and La Forge, R.W., 1996) also influence job satisfaction. Narang and Dwidevi (2010) also reported that Promotion opportunity and respectful treatment figure out in many of the studies as influencing job satisfaction of employees. Monetary compensation remains as one of the important element of the package. In their own view, Kalantan, K.A. Al-Taweel, A.A. and Ghani, H.A. (1999), further posited that good basic pay, rewards and incentives do impact the job satisfaction of the knowledge workers.

Statement of problem

The success of an organisation cannot be separated from employees feeling about the organisation. The need to motivate employees to boost their morale for ease of accomplishing the organisational goals cannot be undermined. Employees are easily motivated to achieve set goals by making incentive available for the organisational employees. The employees of the two institutions investigated have gone through series of strike actions to demonstrate their ill feeling towards the institutions' management. Such unpleasant situation usually has direct bearing on employees' job satisfaction. It is based on this premise that this study investigated the effects of availability of incentives on job satisfaction of academic and non-academic employees of selected Federal Colleges of Agriculture in Oyo State, Nigeria. Specific objective were to:

1. describe the personal characteristics of the respondents;
2. determine factors affecting job satisfaction of academic and noon academic employees of selected institutions in Oyo State; and
3. identify incentives affecting job satisfaction of academic and non-academic employees of selected institutions in the study areas.

METHODOLOGY

Multistage sampling procedure was used in the selection of respondents. Firstly, two research institutes namely Forestry Research Institute (FRIN) and Institute for Agricultural Research and Training (IAR&T) were purposively selected out of seven existing research institutes in Oyo state because of their affiliation with college of agriculture. The senior staffs cadre (Contiss 8 and above) of the two colleges were selected for this study. This cadre of employees was stratified into teaching and non-teaching staffs. Thirty percent of FCF employees (teaching = 122, and non-teaching = 155) staffs and FCAH (teaching = 172, and non-teaching = 275) was selected using

simple random sampling technique. The total number of respondents (sample size) from the two categories was 109. Out of this, only 85 respondents representing 81% of the instrument returned properly filled questionnaire used for analysis.

RESULTS AND DISCUSSION

Personal characteristics of respondents

Table 1 shows the age distribution of respondents. It shows that few (11.8%) of the respondents were below age 30 years, majority (75.3%) were between ages 30-40years while 12.9% fell within the age range of 40years and above. This implies that majority of the respondents are still in their active age and still have many years to contribute to the attainment of the organisational goals. Hence, the organisations need to make enough incentives available to ensure they are satisfied with their jobs. Table 1 further shows that most of the respondents (65.9%) were male while 34.1% were female. The higher percentage of male respondents could be attributed to higher responsibility expected from men as the head of the family; hence, they have to take up appointment in organisations like the two colleges to sustain their family members. The table further shows that few (27.1%) of the respondents were single while majority (72.9%) of the respondents were married. This implies that the organisations need to make provision for incentives that will have positive effects on the family members of the staff such as good health facilities. This will go a long way to improve the respondents' job satisfaction. Majority of the respondents are married. In addition, Table 1 shows that 78.9%, 20.0% and 1.2% of the respondents had one, two and three children respectively. The number of children given birth to by the respondents could help to reduce distraction from home as number of children has influence on level of responsibility which could turn out to be distraction if the situation is not properly handled.

Table 1 also shows the educational status of respondents. It reveals that about one third (31.8%) of the respondents were B.Sc. holders while 9.4%, 22.4%, 31.8% and 4.7% were OND, HND, M.sc and PhD holders, respectively. The high number of BSc. holders and above could be attributed to the fact that the respondents were employees of educational institutions which require higher educational attainment for career progression. On respondents' years of experience, result shows that respondents with 5 years experience were in the majority (67.0%) while 24.7% and 7.1% of the respondents had between 6 and 10years and 11and 15years professional experience, respectively. This implies that most of the respondents are mid-career officers with few numbers of years of experience, which could have implication the turnover rate in the organisation.The annual income of the respondents according to Table 1 shows that majority (88.2%) of the respondents has the highest income rate of ₦1.3 million and above, while few (3.5%) have annual income of ₦400,000 - 800,000 per annum. This implies that respondents annual income is averagely high which alone could serve as financial incentives to enhance job satisfaction of the respondents.

Table 1
Distribution of respondents' personal characteristics

Variables	Frequency	Percent
Age (Years)		
Below 30	10	11.8
30 – 40	64	75.3
Above 40	11	12.9
Sex		
Male	56	65.9
Female	29	34.1
Maritalstatus		
Single	23	27.1
Married	62	72.9
Numbersofchildren		
1	67	78.9
2	17	20.0
3	1	1.2
Educationalstatus		
OND	8	9.4
HND	19	22.4
B.Sc.	27	31.8
M.Sc.	27	31.8
PhD	4	4.7
Religion		
Christianity	74	87.1
Islam	11	12.9
Experience		
<5years	57	67.0
6 -10years	21	24.7
11-15years	6	7.1
16years & above	1	1.2
AnnualIncome		
₦400,000 – ₦800,000	3	3.5
₦900,000 – ₦1.3 million	7	8.3
₦1.3million and above	75	88.2

Perceived effect of incentives provision on respondents' job satisfaction

Incentives are rewards granted to employees to increase their job satisfaction and performance. Incentives are provided besides wages and salaries so that the level of motivation and job satisfaction can be enhanced. Table 2 below shows the incentives provided by the organisations to promote job satisfaction of the respondents.

Incentives provided to promote job satisfaction of respondents

The study findings according to Table 2 show the incentives affecting job satisfaction of both

academic and non-academic staff of the two colleges. Availability of co-operative society within the organisations, ($\overline{X}$ =3.64; $\overline{X}$ =3.47), obtain promotion ($\overline{X}$ =3.43; $\overline{X}$ =3.19) and permission to go on leave when due ($\overline{X}$ =3.43; $\overline{X}$ =3.26) were incentives for academic and non-academic employees, respectively. Employees in both categories stated categorically that the availability of cooperative societies in their organisations has really helped them to meet their financial obligations at very critical moments of their lives. This is due to the fact that members of the cooperative societies have opportunities to access loan when in financial needs. The findings imply that the three incentives mentioned significantly influence the job satisfaction of academic and non-academic employees of the institutions. Therefore, the management of the two colleges need to concentrate on the provision of these incentives to achieve high job satisfaction among their employees.

Table 2
Frequency distribution showing incentives provided to promote job satisfaction of respondents (n=85)

Incentives provided	Not at all	Rarely	Often	Very often	$\overline{X}$	Ranking	SD
Payment for overtime.	**23(54.8)**	**11(26.2)**	**8(19.0)**	-	**1.64**	**12th**	**0.79**
	29(67.4)	12(27.9)	1(2.3)	1(2.3)	1.40	7th	0.66
Provision for travel allowance.	**11(26.2)**	**6(14.3)**	**17(40.4)**	**8(19.0)**	**2.49**	**8th**	**1.12**
	8(18.6)	15(34.9)	16(37.2)	4(9.3)	2.37	8th	0.90
Obtained promotion as at when due.	-	**5(11.9)**	**14(33.3**	**23(54.8)**	**3.43**	**2nd**	**0.70**
	1(2.3)	6(14.0)	20(46.5)	16(37.2)	3.19	3rd	0.76
Opportunity for further training.	**2(4.8)**	**4(9.5)**	**15(35.7)**	**21(50.0)**	**3.31**	**4th**	**0.84**
	-	11(25.6)	17(89.5)	15(34.9)	3.09	4th	0.78
Provision for conference grants.	**4(9.5)**	**14(33.4)**	**11(26.2)**	**13(31.0)**	**2.80**	**5th**	**1.00**
	7(16.3)	10(23.3)	24(55.8)	2(4.7)	2.49	6th	0.82
Reward for hard work.	**12(28.6)**	**14(33.4)**	**10(23.8)**	**6(14.3)**	**2.24**	**9th**	**1.04**
	15(34.9)	13(30.2)	12(27.9)	3(7.0)	2.07	10th	0.96
Availability of carrier opportunities.	**4(9.5)**	**17(40.5)**	**10(23.8)**	**11(26.2)**	**2.74**	**6th**	**1.00**
	4(9.3)	19(44.2)	13(30.2)	7(16.3)	2.53	5th	0.88
Awards for self-motivation/ innovativeness.	**7(16.7)**	**12(28.6)**	**15(35.7)**	**8(19.0)**	**2.57**	**7th**	**0.99**
	7(16.3)	21(48.8)	11(25.6)	4(9.3)	2.28	9th	0.85
Permission to go on leave as at when due.	**3(7.1)**	**2(4.8)**	**10(23.8)**	**27(64.3)**	**3.43**	**2nd**	**0.90**
	2(4.7)	5(11.6)	16(37.2)	20(46.5)	3.26	2nd	0.84
Availability of loan for special projects e.g car purchase, house construction.	**17(40.5)**	**4(9.5)**	**15(35.7)**	**6(14.3)**	**2.24**	**9th**	**1.14**
	19(44.2)	15(34.9)	7(16.3)	2(4.7)	1.83	11th	0.88
Financial assistance to pay children school fees.	**17(40.4)**	**8(19.0)**	**13(31.0)**	**4(9.5)**	**2.18**	**11th**	**1.04**
	24(55.9)	13(30.2)	4(9.3)	2(4.7)	1.66	12th	0.85
Availability of viable co-operative society within the organisation.	-	**2(4.8)**	**11(26.2)**	**29(69.0)**	**3.64**	**1st**	**0.57**
	1(2.3)	2(4.7)	16(37.2)	24(55.8)	3.47	1st	0.70

NOTE: Figures in bracket are the percentages.
$\overline{X}$ = mean; SD = standard deviation
The bold figures are for academic staffs.

Respondents' perception of effects of incentives availability on job satisfaction in the selected institutions

Findings from Figure 1 show that respondents perceived that all the four types of incentives mentioned above affect job satisfaction at varying degree. The types of incentives are moral, financial, natural and coercive. On effects of incentives on job satisfaction, 40% indicated that natural incentives had very high effect on job satisfaction, while 55%, 25% and 35% indicated that coercive, moral and financial had very high effects on job satisfaction in the selected institutions. Few of the respondents 10%, 10% and 4% believed that natural, moral and financial have no effect on job satisfaction, respectively. This implies that since academic and non-academic employees of these institutions believed these incentives have effect on their job satisfaction, it is advised that the managements of these institutions make efforts to make these incentives available for the progress of these institutions.

Relationship between incentive availability to respondents and their job satisfaction

Results of relationship between availability of incentive and job satisfaction reveals that there was a positive and significant relationship between incentives availability and job satisfaction of the respondent ($r = 0.707$, $p<0.05$). This is expected because the incentives provided will influence their job satisfaction. Though a significant relationship exists between incentive availability and job satisfaction, the COD = 0.49 show moderate relationship between the two variables. This finding implies that if the managements of the colleges investigated make necessary incentives available to the employees, they would become more satisfied

with their jobs and their performance on the job will also increase. This will greatly affected quality of graduates from these institutions and their contributions to the growth of the society will be significant.

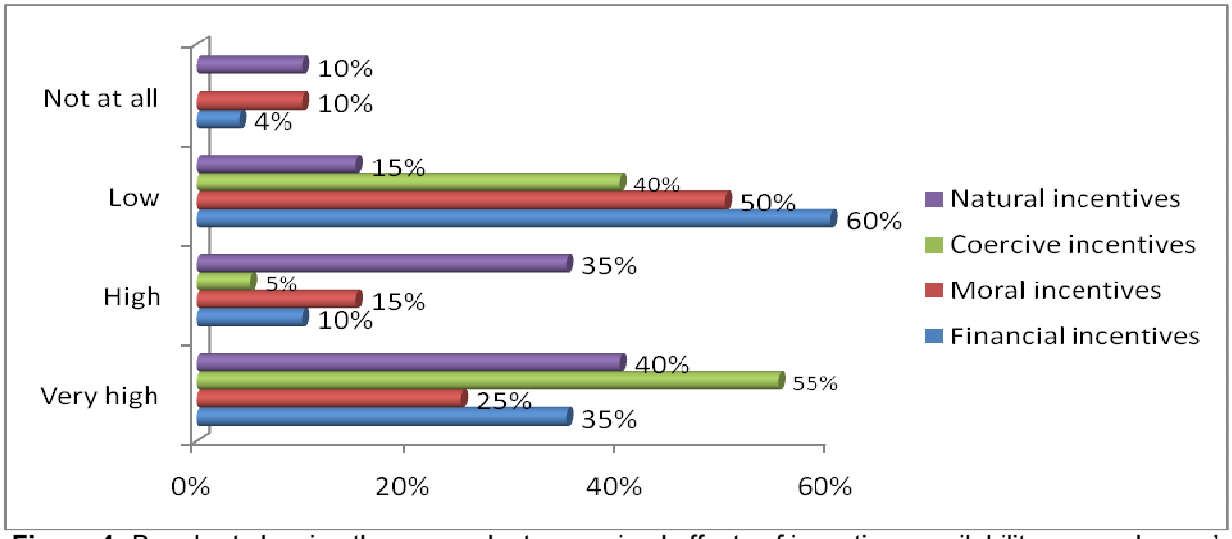

Figure 1: Bar chart showing the respondents perceived effects of incentives availability on employees' job satisfaction

Table 3
Pearson Product Moment Correlation showing relationship between incentives availability and job satisfaction

Variable	r	p-value	COD	Decision
Relationship between incentives availability and job Satisfaction	0.707	0.00	0.49	S

P-value is significant at 0.05 level of significance

Difference in the job satisfaction of academic and non-academic employees of the selected institutions and incentive availability

Table 4 shows that significant difference existed between the job satisfaction of academic and non-academic employees of these institutions. This may be attributed to the varying conditions attached to issues relating to promotion and career progression among academics and non-academics of these institutions. For the academics employees, the need to publish before promotion is an issue considering the fact that funds are not easily accessible to conduct projects or research that will foster paper production. In the case of non-academic employees, no stringent condition is attached to promotion of this category of employees.

Table 4
ANOVA showing level of difference in respondents' job satisfaction across the selected institutions

		Statistical value	
Variable	**F-value**	**P-value**	**Decision**
Job satisfaction	2.71	0.01	Significant

P-valve is significant at 0.05 level of significance

Difference in incentives availability between academic and non-academic employees of the selected institutions

Table 5 shows that significant difference existed in the incentives available to academics and non-academic employees of the institutions. This explains one of the reasons while variation exists in their job satisfaction.

Table 5
ANOVA showing significant difference in incentives availability between academic and non-academic employees across the selected institutions

		Statistical value	
Variable	**F-value**	**P-value**	**Decision**
Incentive availability	2.58	0.013	Significant

P-value is significant at 0.05 level of significance

CONCLUSION AND RECOMMENDATIONS

The study concluded that different types of incentive are available to employees of the selected institution at varying degree. These incentives have significant effects on the employees' job satisfaction. Job satisfaction between academic and non-academic employees of the institutions differs. Similarly, there is difference in the incentives available to academics and non-academic employees of the selected institutions. Finally, financial, moral, coercive and natural incentives affect their job satisfaction at varying degree.

The study recommended as follows;

1. The managements of the institutions need to ensure incentives needed to motivate employees to work harder towards achieving the goals and objectives are provided since the study have shown that incentives greatly influenced job satisfaction of the institutions' employees.
2. Financial incentives according to the study significantly affects employees job satisfaction, hence, issues relating to staff promotion, permission to go on leave, payment of allowances and support for institutions cooperative societies must be given adequate attention by the instructions' management because of the effects they have on employees job performance.

REFERENCES

Al Marri, S.A., A.l. Taweel, A.A. and Elgar, F.J. (2002)Factors influencing job satisfaction among primary health care physicians in Qatar", Qatar Medical Journal, Vol. 11, Pp. 15-18.

Anitha R. 2011.Study on job satisfaction of paper mill employees accessed at http://jms.nonolympictimes.org/Articles/Article6.pdf

Babakus, E., Cravens, D.W., Grant, K., Ingram, T.N. and LaForge, R.W. (1996) Investigating the relationships among sales, management control, sales territory design, salesperson performance, and sales organisation effectiveness", *International Journal of Research in Marketing* Vol. 13, Pp. 345-363.

Bajpai, N. and Srivastava, D. (2004)Sectorial comparison of factors influencing job satisfaction in Indian banking sector", *Singapore Management Review*, Vol. 26 (2) pp. 89-99.

Hassan M., Hassan S., Ud Din K. and Naseem K. (2011) "Employee retention as a challenge in Leather Industry" *Global Journal of Human Social Science*. Vol. 11(2)

Heathfield, S. M. (2014)Whatare incentives at work? In Human Resources. accessed from http://humanresources.about.com/od/employeerecognition/g/what-are-incentives-at-work.htm Retrieved on 20/04/ 2014

Hodson, R. (1996)Dignity in the workplace under participative management: Alienation and freedom revisited"*American Sociological Review*, Vol. 61 (5)pp. 719-738.

Kalantan, K.A. Al-Taweel, A.A. and Ghani, H.A. (1999) Factors influencing job satisfaction among primary health care (PHC) physicians in Riyadh, Saudi Arabia", *Annals of Saudi Medicine*, Vol. 19 (5)pp. 424-426.

Ling-Hsui, C. (2008) Job satisfaction among information system (IS) personnel''*Computers in Human Behaviour*Vol. 24(1) pp 105-118.

Mckinnon, J.L. Harrison, G.L. Chow, C.W. and Wu, A. (2003) Organisational culture: Association with commitment, job satisfaction, propensity to remain, and information sharing in Taiwan", *International Journal of Business Studies* Vol. (11) 1 pp. 25-44.

Mortimer, J.T. and Lorence, J. (1989)Satisfaction and involvement: Disentangling a deceptively simple relationship''*Social Psychology Quarterly*, Vol. 52 (4)pp. 249-265.

Narang, R. and Dwivedi, A. (2010)Managing the job satisfaction of knowledge workers: An empirical investigation. *Asia Pacific Journal of Business and Management*. Vol. 1 (1) pp 1-14. Available online at www.uunz.ac.nz//journal_part.pdf

Parvin M.M. and Kabir M. M. N. (2011)Factors Affecting Employees Job Satisfaction of Pharmaceutical Sector. *Australian Journal of Business and Management Research* Vol.1 (9) Pp. 113-123 Available online at http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1093&context=cahrswp

Sekaran, (1989)Paths to the job satisfaction of bank employees", *Journal of Organisational Behaviour*, Vol. 10 (4) pp. 347-359.

Spector, P.E. (1997)*Job satisfaction application, assessment, causes, and consequences*. Sage Publications, London

Wang, Y.M. (2007) Managing the job satisfaction of knowledge workers. International Conference on Service Systems and Service Management, 9-11, accessed from http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=4280270 on 27th May, 2008.

Farmers' Knowledge of *Jatropha Curcas* as a Renewable Energy Crop in Oyo State, Nigeria

Thomas, K.A.* and Adeoye, A.S.**
*Corresponding author – kehindeadesina@yahoo.com
Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria
**Federal College of Forestry, Jericho, Ibadan, Oyo State, Nigeria

ABSTRACT

Development of sustainable bio-energy from energy crops is considered an important factor in reducing green house emission, acid deposition in soil and chemical runoff, and improvement of the environment for both man and wildlife. This study was necessitated by persistent degradation of the environment resulting from heavy consumption of fossil fuel, agrochemicals and high level of deforestation resulting in depletion of forest resources. The study thus examined farmers' knowledge of Jatropha curcas as a renewable energy crop in Oyo state, Nigeria. Simple random technique was used to select 120 farmers from 243 Jatropha farmers trained in the study area. Parameters assessed include respondents' socio-economic characteristics, awareness, perception and knowledge of Jatropha curcas as renewable energy crop. Information was obtained with the use of a structured questionnaire. Both descriptive and inferential statistics were used to analyse the data. Results show that majority of farmers were male (66.7%), had mean age of 44.4±10.8, married (90.0%), had formal education (91.7%), crop and livestock farming (86.7%) were the main livelihood activities. Awareness of Jatropha curcas as renewable energy crop was mainly through participation (52.5%) in a seminar organized for farmers by a non-governmental organization. Most farmers (62.5%) had favourable disposition and high knowledge (75.5%) toward Jatropha curcas cultivation. Cultivation practice ($r = 0.453$, $p<0.05$) was significantly related to knowledge of Jatropha curcas as a renewable energy crop. Institutionalizing framework by government and non-governmental organizations to promote cultivation of Jatropha curcas will foster healthy environment and consequently mitigate accumulation of green house effect caused by fossil fuel and industrial activities.

Keywords: *Jatropha curcas,* Farmers' knowledge, Renewable energy

BACKGROUND TO THE STUDY

The current challenge experienced throughout the world is the issue of environmental degradation through widespread consumption of fossil fuels. This has prompted the imperative development of alternative energy sources that can lead to sustainability of energy and environment system (Raghuvanshi, Raghav, and Chandra, 2007). The consumption of these energy resources has resulted into climate change and breakdown of the ozone layer, thereby militating against the environment. The participation of the farmers in the production of *Jatropha*crop has become inevitable in Nigeria and other developing countries of the world. The increased cultivation of this energy crop has been adaptable by society for reduction of greenhouse gas emission, soil erosion, and other environmental breakdown (Jonsson, Ostwald, Asphund, and Wibeck, 2011). *Jatropha* is promoted as a drought resistant crop with high potential growth on degraded soils which has positive environmental impact from bio-diesel production (Ostwald, Axelsson, Franzen Berndes, and Ravindranath, 2011). Hence, the accessibility of farmers to adequate information and capacity building training on *Jatropha* cultivation as a potential renewable energy crop will contribute to environmental mitigation and production of bio-fuel for enhancement of a sustainable environment.

In view of these environmental problems, studies have been carried out on the impact of energy crops for environmental sustainability. Development of sustainable bio-energy from energy crops is considered an important factor in reducing greenhouse emission, acid deposition in soil and chemical runoff, and improvement of the environment for both man and wildlife through deliberate forestation project (Olaoye, 2009). Sustainable environment according to Achten (2010) is possible based on the production of bio-diesel which considerably reduces non-renewable energy requirement and greenhouse gas emissions due to fossil fuel consumption, and the pressure on the ozone layer is also abated. *Jatropha curcas* as a potential renewable energy crop is a perennial crop known for its invasive growth, fertility, and adaptability to all soil types. This energy crop is relatively drought resistant with soil erosion control potential, and provides better habitat for man and wildlife. *Jatropha*

curcas has many potential contributions to sustainable environment in the area of wind and soil erosion, serves as good source of organic fertilizer for the soils, facilitates water erosion control, and help in solving deforestation problems in the developing countries (Chachage, 2003).

Consequently, in Nigeria focus still hinges on fundamental issues of food security and sustainable agriculture which has devoted large hectares of land to cultivation of arable crops with militating factors like the use of obsolete cultural practices, scanty plants stands, poor weed control, usage of inorganic fertilizers, with poor management accounting for low productivity of the farmers (Osabuomen, and Okoedo-Okojie, 2011). In a bid to tackle the issue of food insecurity, environmental degradation has become inevitable through the management practices engaged in the production of arable crops. Food crop farmers in Nigeria with their bulk production and provision of arable crops for both local consumption and regional supplies have placed a heavy burden on the environment (Apata, Samuel, and Adeola, 2009)

Jatropha curcas is one of the inedible renewable energy crops which are very critical to ensuring that the environment becomes sustainable for its habitation. The pressing problem of environmental degradation, land deformation, agricultural stagnation, and population explosion in Nigeria can be combated and overcome by agro forestry innovation whereby annual crops interspersed with trees and shrubs (Bankole, Adekoya, and Nwawe,, 2012). However, farmers' knowledge of *Jatropha* cultivation as a potential renewable energy crop will be essential to ensure its deployment for a sustainable environment. Sequel to the foregoing, this research sought to assess farmers' knowledge of*Jatropha* as a renewable energy crop in Oyo State, Nigeria with the following objectives

1. examine the socio-economic characteristics of the respondents in the study area;
2. assess respondents' knowledge of Jathropha cultivation practices, and;
3. assess the knowledge of the respondents on *Jatropha* cultivation as a renewable energy crop.

METHODOLOGY

The study was carried out in Oyo State which is an inland state in the southwestern Nigeria. It covers the land area of approximately 32,241.8 square kilometers. The total population in Oyo stateaccording to the 2006 population census is 5,591,589. It is bounded in the north by Kwara state, in the east by Osun state, in the south by Ogun state and in the west partly by Ogun state and Republic of Benin. The state is made up of thirty-three (33) Local government areas. Oyo state is mainly agrarian and the climate favours the cultivation of crops like maize, yam, cassava, millet, rice, plantain, cocoa tree, palm tree and cashew.

The population for this study constitutes all trained *Jatropha* farmers in Oyo state. There are 243 trained *Jatropha* farmers in all the 33 Local Government Areas (LGAs) in the state. Ido (51), Akinyele (50), and Lagelu (58) were purposely selected due to high number of trainees from the LGAs. Proportionate sample to size was used to select 76% from Ido and Akinyele, while 74% from Lagelu LGAs. This represents 39, 38, and 43 respectively to give a total of 120 farmers interviewed for the study.

Major variable (dependent) measured was knowledge of *Jatropha* cultivation as a renewable energy crop**.** This was measured using a 2-point scale of yes or no for eleven knowledge test items. Correct response attracted 1, while incorrect response was scored 0. The maximum score was 11, while the minimum was 0. Total score for each respondent was computed and mean score 7.5±1.2 determined. Respondents below the mean were regarded as having low knowledge, while those above the mean were categorized as having high knowledge.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Table 1 shows that the mean age was 44.4±10.8. This implies that farmers were dominated by people who are still in their active working age. This result agrees with Adiel (2004) who opined that middle age group (30-45 years) formed the bulk of agro forestry technology adopter in Nigeria. Results on sex reveal that majority (66.7%) were male, while 33.3% were female. This finding is consistent with Adenegan, Adams and Nwauwa, (2013) who asserted that male participation in agricultural production was more than that of the female in Oyo state, Nigeria. This could be as a result of intense women engagement both in house chores and marketing, while male practice farming.

Table 1 further shows that majority (90.0%) were married. This implies that farmers cherished marriage institution and at the same time could have access to family labour. This result agrees with Akangbe et al. (2013) who found that 97.3% of farmers in agricultural development in Moro Local Government Area of Kwara state, Nigeria were married and have access to family labour for their various agricultural enterprises. On household size, majority (64.1%) had between 4 and 6 household members . The implication of this is that the members of their household could be of immense assistance on the farm through their contribution to the farm work. In a related study, Toluwase and Apata (2011) found that 60% of the farmers have household size between

1 and 5 and their participation in agriculture could increases agricultural productivity.

On education, majority (91.7%) had one form of formal education or the other. This implies that level of literacy could have significant influence on their knowledge of *Jatropha* cultivation as a renewable energy crop. This finding agrees with Gordon and Craig (2001). They opined that education increases level of skills and foster access to information on improved agricultural practices. Yasmeen et al., (2011) corroborated this finding in a related study where they found that education may boost farm productivity by refining the quality of labour, increasing the aptitude to regulate disequilibrium for increased rate of total acceptance of agricultural innovation. On occupation, 48.3% of the respondents practiced farming as their major occupation, 29.2% of the respondents were traders, while majority (77.5%) were both farmers and traders. This result is related with the findings of the United States Development Agency (2007) which established that only 45% of farmers claimed farming as their principal occupation and a similar number of farmers agreed on having some other forms of occupation.

Results on respondents' years of farming experience on Table 1 indicate that 25.8% had 13-16 years of farming experience. This is likely to have a positive implication on *Jatropha* cultivation. This report agrees with Babasanya *et al*. (2013); they found that reasonable number of farmers had long years farming experience in cassava production. The number of years of farming experience could have a positive effect on knowledge of *Jatropha* as a renewable energy crop. Consequently, farming experience will affect farm management expertise and decision-making process (Ani et al., 2004). On farm size cultivated, more than half (53.3%) cultivated between 1.2-2.4 hectares This is consistent with Anyaegbunam, Nto, Okoye, and Madu , (2012); who found that average land possessed by farmers for cultivation is about 2.4 hectares.

Table 1
Respondents' distribution by socio-economic characteristics

Socio-economic Characteristics	Frequency	Percentage	Mean
Age			44.4± 10.8years
≤30	9	7.5	
31-40	39	32.5	
41–50	39	32.5	
51-60	22	18.3	
>60	11	9.2	
Sex			
Male	80	66.7	
Female	40	33.3	
Marital Status			
Single	10	8.3	
Married	108	90	
Window(er)	2	1.7	
Educational Status			
No formal education	8	6.7	
Adult education	2	1.7	
Primary	9	7.5	
Secondary	42	35.0	
Tertiary	59	49.2	
Farming Experience			
1-4 years	3	2.4	
5-8 years	12	10.0	
9-12 years	25	20.9	
13-16 years	31	25.8	
21-24 years	13	10.9	
25-28 years	8	6.7	
29-32 years	5	4.1	
33-36 years	3	2.5	
>37 years	2	1.7	
Farm size			
0.5 – 2.5 acres	43	35.9	
3 – 6 acres	64	53.3	
7 – 10 acres	9	7.5	
11 – 15 acres	2	1.6	
16 – 25 acres	2	1.7	

Respondents' knowledge of *Jathropha* cultivation practices

The result on Table 2 shows that all (100%) indicated that *Jatropha* cultivation begins from the nursery through planting of its seeds on the bed. Majority (91.7%) specified that *Jatropha* seedling spend 2 months in the nursery before it is transplanted to the field. Saverys et al., (2008) and Parajuli (2009) corroborated the above results; they confirmed that *Jatropha curcas* is pre-cultivated in the nursery beds as seedlings before being transplanted into the field but at the same time propagated on small scale by seed and stem cuttings directly on the field. Substantial farmers (71.7%) subscribe to planting of 1000 seedlings per 1 acre with the planting distance of either 2m x 2m or 3m x 3m. Many (90.8%) understood the essence for regular weeding operations and pruning. This is in line with Gour (2006) who opined that pruning of *Jatropha curcas* stands as intervention in field management practices which enhances production of more branches, stimulates healthy fruiting and seed yield.

The result further shows that all (100%) indicated *Jatropha* seeds harvesting begins at 10 months, (79.2%) said 1 ton (1000kg) of *Jatropha* is harvested in the first year of cultivation and 80.8% opined that 2 tons of seed harvested in the second year. About 98.3% of the respondents indicated that *Jatropha* oil (bio-fuel) is extracted either manually or by specially-made machine. This result corroborates with the submission of Achten (2010) who reported that the economic life of *Jatropha* curcas varies between 35 years and 40. This result implies that training obtained has immersed enhance respondents' knowledge of *Jatropha* cultivation practices.

Table 2
Distribution of respondents based on cultivation practices of *Jatropha* for sustainable environment in the study are (N = 120).

Cultivation practices	Yes		No	
	F	%	F	%
1. *Jatropha* cultivation begins from the nursery practice is done early in the morning.	120	100		
2. This nursery practices is done early in the morning.	110	91.7	10	8.3
3. Germination of *Jatropha* seeds starts on the 6th day in the nursery bed.	118	98.3	2	1.7
4. *Jatropha* seedlings speed 2 months in the nursery before it is transferred to the field.	110	91.7	10	8.3
5. I prefer to plant hybrid species of *Jatropha* than local breeds.	119	99.2	1	0.8
6. Manual clearing is enough for me as a peasant farmer.	89	74.2	31	25.8
7. Ploughing is done once or twice based on soil types.	97	80.8	23	19.2
8. Ploughing for heavy soils is deep while it is shallow for light soils.	37	30.8	83	69.2
9. I like to use seeds for *Jatropha* cultivation	23	19.2	97	80.8
10. I prefer using seedling for cultivation of *Jatropha*.	115	95.8	5	4.2
11. I buy my planting stock for *Jatropha* cultivation from an NGO.	111	92.5	9	7.5
12. I plant between 600 and 1000 seedling per 1 acre.	86	71.7	34	28.3
13. The planting distance of 2m x 2m or 3m x 3m is used to allow intercropping.	117	97.5	3	2.5
14. Regular weeding is crucial to fruiting of *Jatropha* crop.	117	97.5	3	2.5
15. The weeding of 3-4 times is enough to keep the field free from weeds until the crop crosses the growth period stage.	92	76.7	28	23.3
16. Pruning enhances quick fruiting of the plant	109	90.8	11	9.2
17. Fruiting of *Jatropha* crop is between 6-8 months on its establishment in the field.	119	99.2	1	0.8
18. The plantation site must be cleared of weeds and shades because *Jatropha* required sufficient sunlight to increase fruiting.	120	100		
19. Harvesting of *Jatropha* seeds begins at 10 months.	120	100		
20. One (1) ton – (100kg) of *Jatropha* seeds is harvested in the first year of cultivation.	95	79.2	25	20.8
21. Two (2) tons of seeds are harvested in the first year.	97	80.8	23	19.2
22. The four (4) tons of *Jatropha* seeds are harvested in the third year.	103	85.8	17	14.2
23. The *Jatropha* oil is extracted manually or by special made machine.	118	98.3	2	1.7

Respondents' knowledge of *Jatropha* as a renewable energy crop

The result on Table 3 shows that the majority (100%) asserted that *Jatropha* cultivation under proper management produces fruits with high oil content, removes carbon from the atmosphere (99.2%) and does not contribute to carbon (IV) oxide and sulphur (IV) oxide emission into atmosphere (97.5%). This is consistent with Jain and Sharma (2010). The duo opined that *Jatropha curcas* is drought resistant crop which can be cultivated on waste lands and helps the soil to regain nutrients and assists in carbon restoration and sequestration. The result further shows that all farmers (100%) knew that bio-fuel produced from *Jatropha* is already in use for both domestic and industrial purpose. It can be used for powering generating sets, diesel engines and

cooking stoves which enhances reduction in global warming. Other by- products identified in use for renewable energy source include; *Jatropha* cake being used as organic fertilizer and organic pesticides which prevents contamination of the soil and underground water. It implies that the trained farmers acquired sufficient knowledge of *Jatropha* plant as a renewable energy crop. In a related study, Achten (2010) emphasized that sustainable environment is possible through biodiesel which has the potential to reduce non-renewable energy requirement and greenhouse gas emission. Maingi (2010) also found that majority of *Jatropha* curcas adopters have high knowledge of *Jatropha* curcas for controlling soil erosion, soil fertility enrichment and aforestation.

Table 3
Distribution of respondents' knowledge on cultivation of *Jatropha* for sustainable environment

Knowledge Statements	Yes		No	
	F	%	F	%
1. *Jatropha* crop has no potential for environmental mitigation because it is only useful as a protective plant in driving away evil spirit.	18	15.0	102	85.0
2. The renewable energy crop is drought resistant which makes it non-seasonal plant.	105	87.5	15	12.5
3. *Jatropha* crop can produce its fruits /seeds for fifty (50) years at 4 tons per annum.	118	98.3	2	1.7
4. *Jatropha*curcas removes carbon from the atmosphere	119	99.2	1	0.8
5. It does not contribute to carbon (IV oxide, CO_2, and sulphur (IV) oxide emission into atmosphere.	117	97.5	3	2.5
6. Biofuel produced from *Jatropha* is already in use in the country for both domestic and industrial purpose.	120	100		
7. The biofuel from *Jatropha* is used for powering generating sets, diesel engines, lanterns, and cooking stoves which enhances reduction in global warming.	120	100		
8. The by-products "*Jatropha* cake" is used as organic fertilizers as well as organic pesticides instead of inorganic fertilizer and synthetic pesticides.	119	99.2	1	0.8
9. The oil cake from *Jatropha* seeds is rich in nitrogen, phosphorus and potassium which make it useful for replenishment of infertile soils.	119	99.2	1	0.8
10. *Jatropha* cultivation with proper management produces fruits with high oil content.	120	100		
11. *Jatropha* cake does not contaminate the soil and the underground water as compared to inorganic fertilizer.	119	99.2	1	0.8

Respondents' socio-economic characteristics and knowledge of *Jatropha* cultivation as a renewable energy crop

The result on Table 4 shows that there were significant relationships between respondents' age ($r = 0.891$, $p<0.05$), marital status ($\chi^2 = 18.782$, $p<0.05$), occupation ($\chi^2 = 47.169$, $p<0.05$), household size ($\chi^2 = 46.650$, $p<0.05$) and knowledge of *Jatropha* cultivation as a renewable energy crop. This implies that respondents' selected socio-economic characteristics have some degree of influence on respondents' knowledge of *Jatropha* cultivation as a renewable energy crop. Corroborating this finding, Olatokun and Ayanbode (2009) opined that the indigenous knowledge of Malian rural women has helped in the traditional handling of *Jatropha* curcas for the production of oil for raw material and biofuel. Furthermore, Nyamai and Omuodo. (2007) established that *Jatropha* curcas lends itself greatly to many rural households due to its multiple uses that directly respond to the needs of smallholders.

Table 4
Relationship between respondents' socio-economic characteristics and knowledge of *Jatropha* cultivation as a renewable energy crop

Variables	r-value	Df	χ^2	p-value
Age	0.891*		-	0.000
Sex	-	1	2.644	0.450
Marital status	-	3	18.72	0.005
Educational level	-	4	15.066	0.238

*significant @ $p<0.05$

Respondents' cultivation practices and the knowledge of *Jatropha* as a renewable energy crop

The result on Table 5 reveals that there is significant relationship between the respondents' cultivation practices and knowledge of *Jatropha* as a renewable energy crop ($r = 0.453$, $p<0.05$). The result shows that the training has impacted the farmers to understand the rudiments of cultivation practices and *Jatropha* as a renewable

energy crop. Maingi (2010) confirms that majority of *Jatropha* curcas adopters have high knowledge of *Jatropha* curcas for controlling soil erosion, soil fertility enrichment and aforestation. Contrary to this result, Obiero et al. (2013) opined that smallholder *Jatropha* farmer in Kenya have limited knowledge of *Jatropha* agronomic practices.

Table 5
Respondents' cultivation practices and the knowledge of *Jatropha* as a renewable energy crop

Variable	r-value	p-value
Farmers' knowledge of *Jatropha*	0.453*	0.000

*significant @ p<0.05

CONCLUSION AND RECOMMENDATIONS

From the foregoing, it can be concluded that there is high knowledge of *Jatropha* as a renewable energy crop. To enhance the knowledge, production and utilization of *Jatropha*, non-government organisationsand relevant research institutes should embark on deliberate sensitization campaign to ensure farmers involvement in cultivation practices and utilization of its biofuel in Nigeria.

REFERENCES

Adenegan, K.O., Adams, O. and Nwauwa, L.O. (2013) Impacts of small scale farm households on agricultural commercialization in Oyo State, Nigeria. *British Journal of Economics, Management and Trade. Vol.3 (1),pp1-11*. Retrieved July 15, 2013 from www.sciencedomain.org/download.php%

Achten, W. (2010) Sustainability evaluation of bio-diesel from *Jatropha*curcas L.: A Life Cycle Oriented Study. Retrieved March 12, 2013 from perswww.kuleuven

Akangbe, J.A., Oloruntoba, O.O.Achom, B., and Komolafe, S.E. (2013)Anappraisal of transportation facilities effect on agricultural development in Moro Local Government Area of Kwara State, Nigeria. *Ethiopian Journal of Environmental Studies and Management*.Vol.6 (2).

Ani, A.O., Ogunnika, O. and Ifah, S.S. (2004)Relationship between socio-economic characteristics of rural women farmers and their adoption of farm techniques in Southern Ebonyi State, Nigeria.*International Journal of Agriculture and Biology*.Vol.6 (5)Retrieved July 15, 2013 from www.ijab.org

Anyaegbunam, H.N., Nto, P.O., Okoye, B.C. and Madu, T.U. (2012)Analysis of determinants of farm size productivity among smallholder cassava farmers in South-East Agro-Ecological Zone, Nigeria. *America Journal of Experimental Agriculture*. Vol.2 (1)74-80.

Apata, T.G., Samuel, K.D., and Adeola, A.O. (2009)Analysis of climate change perception and adaptation among Arable Food Crops Farmers in Southwestern Nigeria *Proceeding ofInternational Association of Agricultural Economists' 2009 Conference*, Beijing China. Retrieved December 9, 2012 from ageconsearch.umn.edu/bitstream

Babasanya, B., Oladele, O.G., Odidi, O.O., Ganiyu, L., Apene, E., Efim, J., Olafemi, S.O., and Sirajo, A. (2013)Farmers' perception and knowledge needs for adoption of new cultivars of cassava in Igabi Local Government Area, Kaduna State, Nigeria. *Journal of Biology, Agriculture, and Health Care*.Vol.3 (2). Retrieved July 18, 2013 from www.iiste.org

Bankole, A.S., Adekoya,A.E., and Nwawe,C.N. (2012)'Women awareness and utilization of agroforestry practices in Oluyole Local Government Area of Oyo State,Nigeria'. *International Journal of Agricultural Economics and Rural Development*. Vol.5(1). Retrieved February 2, 2013 from www.lautechaee-edu.com/journal/ijae...

Chachage, B. (2003)*Jatropha*oil as a renewable fuel for road transport: Policy implication for technology transfer in Tanzania. Retrieved March 12, 2013 from lup.lub.lu.

Gordon, A. and Craig, C. (2001):Rural non-farm activities and poverty alleviation in Sub-Saharan Africa. Policy Series 14, Chalthman, U.K, NRI. Retrieved July 19, 2013 from www.article.sapub.org

Gour, V.K. (2006) Centre for *Jatropha* Promotion. Retrieved July 20, 2013 from www.*Jatropha*world.org

Jonsson, A.C., Ostwald, M., Asphund, T., and Wibeck, V. 2011: 'Barriers to and driver of adoption of energy crops by Swedish farmers': An Empirical Study. *World Renewable Energy Congress* 2011. Retrieved September 8, 2012 from www.ep.liu.se

Maingi, R.N. (2010) Thepotential role of *Jatropha*curcas L. for environmental management and sustainable livelihoods in Kibwezi, Kenya. A Thesis submitted for Master Degree in Environmental Studies (Community Development) in the School of Environmental Studies of Kenyatta University, June 2010 Retrieved July 24, 2013 from www.ku.ac.ke/schools

Nyamai, D.O. and Omuodo, L.O. (2007)*Jatropha*curcas : The untapped potential in Eastern and Central Africa; Production and Utilization Manual. Trees On-farm Network Publisher, pp 49. Retrieved July 28, 2013 from www.books.google.com/books/about/Jatroph

Obiero, C., Birech, R., Maling'a, J., Freyer, B., Ngetich, K. and Lang'at, J. (2013) Performance and challenges of biofuel cropping systems in Kenyan smallholder farming systems : A case study of castor (Ricinuscommunis L.), *Jatropha* (*Jatropha*curcas L.), croton (Croton megalocarpus L.). *Australian Journal of Crop Science* Vol.7 (7) pp917-922 (2013). Retrieved January 20,2014 from www.cropj.com

Olatokun, W.M. and Ayanbode, O.F. (2009) Use of indigenous knowledge by women in Nigeria rural community. Retrieved July 28, 2013 from www.nopr.niscair.res.in/bitstream/12345

Olaoye, J.O. (2009)Ananalysis of the environmental impacts of energy crops in Nigeria toward environmental sustainability. Retrieved December 9, 2012 from iworx5.webxtra.net

Osabuomen, J.I. and Okoedo-Okojie, D.U. (2011) 'Analysis of the effect of arable crops production practices among farmers on environmental degradation in Edo State, Nigeria'.*Archives of Applied Science Research* Vol.3(2) pp.353-360. Retrieved January 18, 2013 from http://scholarsresearchlibrary.com/archive.html

Ostwald, M., Axelsson, L., Franzen, M., Berndes, G., and Ravindranath, N.H. (2011)Performance of *Jatropha*biodiesel production and its environmental and socio-economic impacts.A case study of Southern India.World Renewable Energy Congress 2011 – Sweden. Retrieved March 12, 2013 from www.focali.se

Parajuli, R. (2009) *Jatropha*curcas and its potential applications: Environmental expert. Retrieved August 05 , 2013 from www.environmental.expert.com

Raghuvanshi, S.P., Raghav, A.K., and Chandra, A. (2007) Renewable energy resources for climate change mitigation'.*Journal of Applied Ecology and Environmental Research* Vol.6(4) pp15-27. Retrieved December 9, 2012 from http://www.ecology.uni-corvinus.hu

Saverys, S., Terren, M., Winandy, S., and Haveskercke, P. (2008) Attempted cultivation of *Jatropha*curcas L. in the Lower Senegal River. Retrieved August 08, 2013 from www.tropicultura.org

Toluwase, S.O.W. and Apata, O.M. (2011)Impact of Farmers' Cooperative on Agricultural Productivity in Ekiti State, Nigeria.Greener *Journal of Agricultural Sciences*.Vol.3 (1), pp63-67. Retrieved August 10, 2013 from www.gjournals.org

United States Department of Agriculture (USDA) (2007)Census of Agriculture. Retrieved August 10, 2013 from http://www.epa.gov/agriculture/ag101/demographics.html

Yasmeen, K., Abbasian, E. and Hussain, T. (2011) Impact of Educated Farmers on Agricultural Product.*Journal of Public Administration and Governance*Vol.1 (2).ISSN 2161-7104.Retrieved August 10, 2013 from www.macrothink.org

Performance and Egg Quality Characteristics of Layers Fed Diets with Varied Energy Levels

G. O. Adeyemo
Department of Animal Science, Faculty of Agriculture and Forestry, University of Ibadan, Nigeria
Email: gbemiadeyemo7@gmail.com

ABSTRACT

This study was carried out to determine the effect of feeding varied energy level diets with balanced crude protein on the performance and egg quality characteristics of laying birds. One thousand two hundred (1200) Isa-Brown laying birds were allocated to four different diets in a completely randomized design. Diets 1, 2, 3, and 4 had 2500kcal/kg, 2600kcal/kg, and 2700kcal/kg and 2650kcal/kg energy respectively, with the study lasting 10 weeks. Data were collected on feed intake, egg production, egg weight, length, and width, yolk depth, length, and width, albumen width, length and depth, shell thickness and performance of laying birds fed the different diets. Results indicate that laying birds fed with 2,500kcal/kg performed better. The feed intake was highest and egg production also was highest without compromising the internal and external egg qualities. This gives an indication that adequate feed intake of balanced diet with moderate energy to a large extent will enhance better performance.

Keywords: Energy levels, Egg quality, Layers' performance

INTRODUCTION

Poultry production has been retarded by high cost of feeding ranging between 60-70% of the cost of production. Adeyemo *et al* (2007). Tewe and Egbunike (1992) reported that the energy content constitutes between 45-60% of finished feed for monogastric livestock. Carbohydrate feeds are basically the major energy sources in livestock feeds. Feeds that are best sources of energy for poultry birds contain carbohydrates that are readily digested such as sucrose, maltose, and starch which are needed for body maintenance and production Buttery *et al.* (2006). Dietary energy levels usually determine the levels of other nutrients including proteins and amino acids. Leeson and Summers (1997) recommended that the dietary energy density of pullets should be 3000 kcal ME.

Scott *et al.* (1982) reported that energy intake has virtually no effect on egg size and at low protein intake, increasing energy may result in reduced egg size. Therefore, egg mass apparently is most responsive to energy than protein intake. Also as energy intake increases, there is a drastic increase in egg production. In general, poultry birds adjust their feed in take to satisfy their energy requirement which vary with body size, environmental temperature and rate of lay. Laying birds should be given feeds with appropriate energy level so as to prevent them from utilizing energy from sources like their body protein causing a reduced production level and weight loss of the birds. This occurs as a result of compromise in its muscle mass due to energy shortage. While these relationships are commonly understood in commercial feed formulation today, it would be highly desirable to verify the rather old results with modern hybrid layers to quantify the effects and fine-tune recommendations (Jeroch, 2011).

Poultry egg is an excellent food that contains 12-13% of the crude protein of an egg weight (Lamberson and Firman, 2002). According to Lamberson and Firman (2002), egg quality relates generally to various standard imposed on eggs or all characteristics of an egg that affects its acceptability to a consumer. It is assumed that an egg with good quality should not float in water because it has a density that is slightly higher than that of water. The standards imposed on egg characteristics can be divided mainly into those used in the determination of external and internal qualities. Generally exterior and interior egg quality standards are based on soundness, texture, colour, shape, relative viscosity of the albumen, shape and firmness of the yolk and freedom from foreign matter in the albumen.

The objective of this study was to determine the optimal energy level that is best for modern hybrid layers production in the tropics.

MATERIALS AND METHODS

The experiment was carried out at the Zartech Research Pen of the poultry section at the Teaching and Research Farm, University of Ibadan. One thousand two hundred (1200) Isa-Brown layers 30 weeks of age were used for the experiment. The birds were randomly allocated to four diets having varied energy levels with 3 replicates per diet in a completely randomized design. The farm environment was constantly cleared and kept clean, feeds and water was constantly available to the birds and the litter was constantly packed. The birds were fed *ad*

*libitum*and eggs were picked twice per day. The birds were fed the varied energy level feed for 3weeks to acclimatize with the change in the feeding regime. The gross compositions of the diets are presented in Table 1.

Table 1
Gross composition of experimental diets with varying energy levels fed to layers.

	Treatments			
Ingredients (%)	**1**	**2**	**3**	**4**
Maize	39.95	49.44	51.93	49.76
Soya bean meal	12.98	12.98	12.98	12.98
Groundnut cake	9.99	11.82	11.98	11.75
Wheat bran	6.82	5.66	2.00	4.96
Corn bran	9.99	9.86	7.82	5.15
Palm kernel cake	8.99	3.00	1.00	3.12
Oyster shell	9.49	9.49	9.49	9.49
Bone meal	2.00	2.00	2.00	2.00
Methionine	0.15	0.15	0.15	0.15
Lysine	0.15	0.15	0.15	0.15
Salt	0.25	0.25	0.25	0.25
Layers premix	0.25	0.25	0.25	0.25
Crude Protein (%)	16.50	16.50	16.50	16.50
Metabolizable Energy (Kcal/kg)	2500	2600	2700	2650

Data collection

The feed consumed by each replicates were measured weekly by dividing the total feed intake by the number of birds per replicate. Egg collection was done twice a day in the morning and evening. The numbers of eggs produced were recorded on a daily basis to evaluate the performance of the birds and monitor increase or decrease in percentage production.

Egg Quality

Egg-quality measurements were made on all eggs, freshly collected, laid on two consecutive days. Egg quality was based on determination of external and internal indices, and egg components. The external indices include egg-shape index and shell thickness, and those of interior quality were albumen index, haugh unit score and yolk index. Collected eggs were weighed individually and their widths and lengths were measured. Then, they were broken onto a smooth level surface and the height of albumen was determined, away from the chalazae, at the two highest points on opposite sides of the yolk, using a standard tripod micrometer. The average of the two measurements of thick albumen height together with egg weights were used to compute the Haugh unit score for each individual egg as cited by Larbier and Leclercq (1994), as follows:
Haugh units = $100\log (H + 7.57 - 1.7w^{0.37})$
where H is albumen height in millimetres (mm) and W is egg weight (g).

Yolk height was also determined using the same micrometer, while yolk diameter was measured to the nearest 0.1 mm using a steel Vernier caliper. Yolk index was calculated as yolk height × 100 divided by yolk diameter. Egg-shape index was measured as egg width × 100 di-vided by egg length. Albumen index was calculated as: [(albumen height (mm)/average of albumen length (mm) and albumen width (mm)] × 100. Shell thickness was measured using a micrometer screw gauge. Measurements were made at two corresponding positions on the equator of the eggshell and the average was recorded to the nearest 0.001 mm

All the data collected were subjected to analysis of variance. The treatment means were separated using Duncan's Multiple Range Test.

RESULTS AND DISCUSSION

Results presented in Table 2 show that there were no significant differences ($p>0.05$) observed for all parameters assessed except for yolk length ($p<0.05$). Numerical indices however showed that hen-day production was highest at 2500kcal/kg, while the lowest value was at 2700kcla/kg. This same trend was also observed for feed intake and egg weights as well as yolk length ($p<0.05$). Yolk weights and albumen weights were however lowest at 2500kcal/kg and highest at 2650kcal respectively. Feed intake is a major determination of the production rate and this becomes very obvious in the egg production result obtained as birds fed 2,500kcal/kg had the highest egg production and they also consumed the most feed. Since the birds were all subjected to the same environmental conditions, the disparity in feed intake cannot be attributed to environmental factors but to the energy contents of the different diets because birds fed the highest energy ate the least feed. Birds eat to meet their energy requirement and once there energy requirement is met, they stop eating until the feed they have

consumed is used up. Feed intake is directly proportional to egg production and the higher the energy level the lower the intake (Adeyemo and Longe, 2008). This makes energy level inversely proportional to feed intake.

As reported by Pardio *et al.* (2005), energy inclusion levels have little or no significant influence on egg shell thickness. Also, Wu *et al* (2007) reported that nutrient density in diets do not have any significant difference on shell thickness except the amino acids, calcium and phosphorus inclusion levels in the diet is altered. Therefore, the result obtained for shell thickness could be as a result of environmental factors which agrees with Oluyemi and Roberts (1979) that the average shell thickness of egg laid by birds during the first few weeks of lay is 0.34mm but is usually thinner in the tropics than in the temperate, where the shell thickness is reduced. Samli *et al* (2005) reported that increased laying hen productivity leads to reduction in egg shell quality and an improvement of albumen quality which agrees with what Oluyemi and Roberts (1979) reported, that egg production increases with the age of the birds and later drops gradually from peak to about 65% before the birds reaches moulting.

Table 2
Effect of varying energy levels on performance and egg quality parameters of laying birds

	Treatments				
Parameters	1	2	3	4	SEM
Hen-day Egg Production	71.20	53.60	50.10	61.30	4.12
Feed Intake(g)	63.48	58.20	53.83	60.35	1.53
Egg weight (g)	61.35	60.49	59.95	61.22	1.11
Specific gravity (ml)	59.43	59.81	59.52	60.64	1.61
Egg length (cm)	5.34	5.35	5.27	5.31	0.24
Egg width (cm)	4.37	4.32	4.34	4.36	0.04
Shell thickness (mm)	0.31	0.31	0.30	0.33	0.02
Yolk length (cm)	3.63^{a}	3.58^{ab}	3.53^{b}	3.61^{ab}	0.04
Yolk width (cm)	3.46	3.40	3.40	3.43	0.04
Yolk depth (cm)	1.64	1.60	1.61	1.64	0.05
Albumen length (cm)	8.27	8.02	7.86	8.11	0.87
Albumen width (cm)	6.39	6.27	6.09	6.14	0.22
Albumen depth (cm)	1.50	1.39	1.40	1.37	0.57
Yolk weight (g)	14.54	14.71	15.06	15.15	0.95
Albumen weight (g)	19.22	19.50	19.66	20.33	2.74

SEM: Standard Error of Mean

CONCLUSION

The result of this work showed that varying levels of energy in diets with constant crude protein at the required level had no significant effect on the performance and egg qualities of Isa brown layers. Numerical values however reveal 2500kcal was optimal for laying birds in the tropics like Nigeria.

REFERENCES

Adeyemo, G.O. and Longe, O.G. (2007) Effects of graded levels of cottonseed cake on performance, haematological and carcass characteristics of broilers fed from day old to 8 weeks of age. African Journal of Biotechnology Vol. 6(8):1064-1071.

Adeyemo G. O. and Longe O. G. (2008)Effect of Cottonseed Cake Based Diets on Performanceand Egg Quality Characteristics of Layers.Pakistan Journal of Nutrition 7 (4): 597-602

Buttery, P.J., Boorman, K.N.(2006)The energetic efficiency of amino acids metabolism in coal, D.D.A (ed) protein metabolism and nutrition Pg. 199-204 (London, Butter worth press).

Jeroch, H.(2011) Recommendation for Energy and Nutrients of Layers- A critical Review Lohmann Information Vol. 46(2): 61

Larbier M. and B. Leclercq (1994) Nutrition and Feeding of Poultry. Nottingham University Press, Loughborough, pg. 305.

Lamberson, W. R., and Firman J.D. (2002)A comparison of quadratic versus segmentregression procedures for estimating nutrient requirements. Poult Sci. 81: 481-484.

Leeson S. and Summers J.D.(1997)Commercial Poultry Nutrition.2nd edition. Published byUniversity books, Geulph, Ontario, Canada.

Oluyemi, J.A., and Roberts, FA. (1979) Poultry production in warm wet climates. The Macmillan press Ltd, Hong Kongpg 131.

Pardio, V.T., L.A. Landin, K.N. Waliszewski, F. Perez-Gil, L. Diaz, B. Hernandez (2005) The effect of soybean soapstock on the quality parameters and fatty acid composition of the hen egg yolk. Poultry. Science. 84, 148-157.

Samli H.E., Ahma A. and Senkoylu N. (2005) Effects of storage time and temperature on

egg quality in old laying hens.*Journal of Applied Poultry Resources* 14:548-553.

Scott, M.L, Nesheim, M.C. and Young, R.J (1982) Nutrition of the Chicken. M.L. Scott and Associates, Ithaca, New York.

Tewe, O.O,Egbunike, G.N (1992) Utilization of cassava in non-ruminantlivestock feed. Incassava as livestock feed in Africa. Ed s.t Hahn, L. Reynolds and G.N Eghunike, IITA, Ibadan Pg 54-57.

Wu G., Bryant M.M, Gunawardana P., Ronald Sr D.A (2007) Effect of Nutrient Density on Performance, Egg Components, Egg Solids, Egg Quality and Profits and Profits in Eight Commercial Leghorn Strains during Phase One. *Poultry Science*. 86:691-697.

The Implementation of Certification Standards and Challenges faced by Smallholder Cocoa Farmers in Osun state Nigeria

Ajaelu B.M. and Olajide O. Adeola
Department of Agricultural Economics, University of Ibadan, Oyo State Nigeria
Email: preciousfunso@yahoo.com

ABSTRACT

Cocoa is the back bone of the agricultural economy in Nigeria. The Agricultural *Transformation Agenda is set to make the sector more economically viable by increasing the productivity of cocoa farmers. But certain production standards must be met in a bid to produce cocoa that would be acceptable in the export market. This study examined the degree of implementation of standards set by certifying organizations. The study was carried out in Osun State. A multi-stage sampling procedure was used to select 150 cocoa farmers who were interviewed using a structured questionnaire. The data collected was classified through a hierarchical clustering technique to give two clusters- The Older, Experienced with Large family size (OELs) and the Younger, Less experienced with Small family size (YLes); a comparative analysis was then carried out using descriptive and inferential statistics (Mann-Whitney U Test) Results show that farmers from the two clusters differ significantly in age, level of education , and household expenditure ($p<0.05$). In terms of production activities, the two clusters pay attention to meeting basic production standards such as weeding (100 %), shade management (97 %) but default on method of harvesting (68 %). They also default in post-harvest handling requirements like sorting of pods and destruction of diseased and infected pods. Poor finance (51% and 52 % respectively from each cluster), pests and diseases (36% and 34 % respectively from each cluster) are the major challenges faced by the farmers and these are mainly tackled by getting loans to buy the necessary chemicals required. The overall results show that farmers in the OEL-cluster comply better with required standards. The policy implication of the study is that national institutions responsible for cocoa should be more effective at the rural level by working with non-governmental organizations committed towards enhancing rural people's livelihoods. Working together with such organizations and certification organizations can make certification more inclusive and a common place norm in the cocoa economy.*

Keywords: Certification, Agribusiness, Value chain, Smallholder farmers

INTRODUCTION

Cocoa is the back bone of the agricultural economy in Nigeria (Adegeye and Dittoh, 1986). Consumers' interest in the production process leading to the final item purchased and the need to ensure increased supply of raw materials to cocoa processing industries combined to increase the demand for sustainably produced cocoa (Dongo et al 2009). This led to the creation of certain standards which cocoa farmers should meet and for which they are certified. Certification introduces sustainability and traceability holistically and guide farmers with respect to the principles of sustainable agriculture, the issue of sustainability and its related economic, social and environmental dimensions. It aims at creating a sustainable line of certified cocoa and to pioneer sustainable cocoa production for international market (Dossou, 2009; CREM, 2012).Oseni and Adam (2013) identified four major certification schemes for cocoa commodity. The first is the Fair trade certification for small-scale producers' organizations which requires adherence to a set of environmental standards as well as robust social standards. It provides organized producers with a Fair-trade Premium, in addition to monies earned from the product, which is used for investment in social, economic and environmental sustainable development. The second is Certified Organic which is based on four principles – health, ecology, fairness and care – that work to sustain the health of people, soils and ecosystems and to reduce poverty. Certification requires that cocoa be grown without the use of synthetic nutrients and that plant protection methods and soil conservation practices be employed. The third is the Rainforest Alliance whose certified farms must meet the Sustainable Agriculture Network's criteria, which include environmental, social, labor and agronomic management. It aims to ensure that all farms benefit from the United Nation's Universal Declaration of Human Rights and Children's Rights Conventions, and that they adhere to International Labor Organization conventions and recommendations. The fourth is the UTZ

certification which aims at encouraging socially and environmentally responsible cocoa production that is beneficial to both producers and the market. It requires producers to adhere to certain agricultural practices as well as social and environmental criteria.

The standards set by the organizations are not necessarily the same but they have a common aim of improving the livelihood of smallholder farmers who are the major producers in the long run. The standards are desirable and attainable but appear intimidating when matched against the low literacy level of farmers. Examples of such standards as given by the Fair-trade Labeling Organization (2011) include limits on moisture contents, moulds, broken beans and the presence of infected beans (Moisture content 6-8%, Moulds 3-5%, Slaty 4-5%, Escherichia Coli negative, Broken beans 2-3% and Impurity 2-4%); these form the basis for standardizing supplies into grades. Based on the count of defective beans in the cut test, the best grade is grade II with a maximum limit on 3 percent on mouldy, slaty and insect damaged, germinated, flat or otherwise defective beans. Next in hierarchy is grade II which has a maximum limit of 4 percent on mouldy beans, 8 percent on slaty beans and 6 percent on insect damaged, germinated, flat or otherwise defective beans. All dry cocoa which fails to reach the standard of Grade II are then regarded as sub-Standard cocoa and so marked (SS). According to (SIPPO, 2010) for the export of cocoa, the beans are usually bagged in bags of 60 to 70kg. The bags should provide the enough information to be able to trace the source as well as the buyer. Such information include the name and address of producer or packer, country of origin, designation of product, quality class or grade, date of harvesting, weight, lot number, destination with address of trader/importer and Clear information on organic certification (standards applied, certifier, year of conversion or full organic status).

The extent to which farmers who are not in a certifying organization's cooperative are able to meet these standards will impact total production and income generated. Having this information is particularly important for Nigeria because of the current Cocoa Transformation Agenda which has been put in place. Key targets of the Cocoa Transformation Agenda include, the doubling or even tripling of the current production, from 250,000 metric tons within the next 3 years, to 1 million metric tons in the next 5 years (i.e. counting from 2012), in order to increase the countries market share in the world cocoa market (FMARD, 2011). Achieving this target requires that the capacity of farmers to meet required standards must be built; it therefore means that information on current practices with a view to identifying strengths and gaps upon which policies and programs can be based is required. This study focuses on the activities of smallholder cocoa farmers in Osun state with the view of highlighting the farming practices employed and the extent to which these comply with required standards.

METHODOLOGY

Osun state is one of the active cocoa producing states in Nigeria with thirty local government areas. The study was conducted in 14 villages in two selected local government areas. Osun state was purposively chosen for this study because it is a vibrant cocoa producing state, with a high population of small holder cocoa farmers. A multi-stage sampling procedure was used. In the first stage, the 2 local governments were randomly selected; in the second stage 14 villages were purposively selected and in the final stage 150 cocoa farmers were selected from members of the Cocoa Producers Association. The standards set by the Fair trade labeling organization were used as a benchmark to compare farmers' practices. The data collected was grouped into two clusters using a hierarchical clustering process. The variables used in the clustering procedure are age, family size, and experience in cocoa farming. These were selected based on the fact that research has shown that they influence productivity and decision making in the household. The first cluster consists of respondents that are Older, more Experienced and have relatively Large families-**OEL**Cluster. The second cluster consists of Younger farmers who are relatively Less experienced and have Small families-**YLeS** Cluster. The data were then analyzed using descriptive statistics and inferential statistics-Mann Whitney U Test.

The Mann-Whitney U test is a nonparametrictest of the null hypothesis that two samples come from the same population against an alternative hypothesis, especially that a particular population tends to have larger values than the other. It has greater efficiency than the *t*-test on non-normal distributions, such as a mixture of normal distributions, and it is nearly as efficient as the *t*-test on normal distribution. It is computed by assigning numeric ranks to all observations, beginning with 1 for the smallest value. Where there are groups of tied values, a rank equal to the midpoint of unadjusted rankings is assigned. These are then added up for the observations which came from sample 1. The sum of ranks in sample 2 is determinate, since the sum of all the ranks equals $N(N + 1)/2$ where N is the total number of observations ((www.wikipedia.org)

U is given by:

$$U_1 = R_1 - \frac{n_1(n_1+1)}{2}$$

where n_1 is the sample size for sample 1, and R_1 is the sum of the ranks in sample 1.
It doesn't matter which of the two samples is considered sample 1. An equally valid formula for U is

$$U_2 = R_2 - \frac{n_2(n_2+1)}{2}$$

The smaller value of U_1 and U_2 is the one used when consulting significance tables. The sum of the two values is given by

$$U_1 + U_2 = R_1 - \frac{n_1(n_1+1)}{2} + R_2 - \frac{n_2(n_2+1)}{2}.$$

Knowing that $R_1 + R_2 = N(N+1)/2$ and $N = n_1 + n_2$, the sum is

$$U_1 + U_2 = n_1 n_2.$$

RESULTS AND DISCUSSION

Socioeconomic characterization of smallholder cocoa farmers in Osun state

The OEL-cluster as expected had a higher percentage of farmers within the age bracket of 51-70, more importantly about 31 percent were over 70. The YLeS-cluster had a lower percentage of illiterates and a longer period of exposure to formal education. The level of education has a similar pattern in both cases. While the OEL had an average of 40 years of experience in cocoa farming, the young and inexperienced had about 20 years. Household food expenditure is a proxy measurement for income earned, a comparison of the monthly food expenditure suggests that the OEL earned a better income while the YLeS earned relatively lower income but spent more money on non-food items. Farmers in both clusters belonged to one social group or the other and this explains why most of them also have access to credit (see Table 1).

Table 1
Households' socioeconomic characteristics

Item	OEL-Cluster N = 83		YLeS-Cluster N = 67	
	Frequency	Percentage	Frequency	Percentage
Age				
31-50	0	0.0	40	49.5
51-70	57	68.8	27	40.5
>70	26	31.2	0	0.0
Mean	67.17**		48.21**	
Educational Attainment				
0	39	47.0	15	22.4
1-6	34	41.0	36	53.7
7-12	10	12.0	16	23.9
Mean	2.94**		5.63**	
Family size				
1-5	3	3.6	0	0.0
6-10	36	43.3	4	6.0
11-15	16	19.3	8	12.0
16-20	6	7.2	18	26.9
>20	22	26.6	37	55.1
Mean	13.59**		5.70**	
Farming experience				
<20	0	0.0	16	24.0
20-29	13	15.6	42	62.7
30-39	18	21.6	8	12.0
40-49	36	43.3	1	1.5
>50	16	19.2	0	0.0
Mean	39.14**		22.45**	
Household Food Expense (₦/Month)	22234.33**		4810.48**	
Household Non-food Expense (₦/Mth)	14474.09**		11199.25**	
Social Group Membership	0.96		0.96	
Access to Credit	0.43**		0.224**	

Notes: * Significant at 90% confidence interval ** Significant at both 95% and 90% confidence interval. All tests are Mann-Whitney test

Cocoa farm management practices carried out to enhance certification

Several production practices are carried out by the farmers in an effort to meet the fair trade standards. The activities are similar across board and include: weeding, cocoa nursery management (e.g shade provision and fertilizer application), removal of infected or diseased pods from cocoa trees etc. These activities were said to prevent the outbreak of diseases and increase productivity per unit of resource used. Harvesting practices as stipulated by the Fair Trade

Organization is followed across board. These standards include harvesting of ripe cocoa pods, use of sharp knife/machete etc. These practices are expected to enhance the vitality of the trees and leave them in a condition that will ensure continued fruiting. A few members of both clusters do not pay attention to these practices; such people need to be assisted or supported to adopt the management practices. The unwholesome practices carried out by these few include the use of blunt knife/machete, shaking of trees at harvest or use of sickles. These unwholesome practices damage the cushions of the trees making them a potential point of entry for fungi and inadvertently spread fungal diseases (see table 2).

Table 2
Cocoa farm practices aimed at meeting the FLO Standards (Production practices)

	OEL-Cluster (N = 83)		YLeS-Cluster (N = 67)	
Items	**YES**	**NO**	**YES**	**NO**
Weeding	83(100.0)	0 (0.0)	67 (100.0)	0 (0.0)
Shade Management	82 (98.8)	1 (1.2)	65 (97.0)	2 (3.0)
Removal of infected pods	81 (97.8)	2 (2.4)	66 (98.5)	1 (1.5)
Fertilizer application	22 (26.5)	61 (73.5)	12 (17.9)	55 (82.1)
Status of Pod at Harvesting				
	Frequency	**Percentage**	**Frequency**	**Percentage**
Ripe pod	83	100.0	66	98.5
Unripe pod	0	0.0	1	1.5
Over-ripe pod	0	0.0	0.0	0.0
Total	**83**	**100.0**	**67**	**100.0**
Method of harvesting				
Blunt Knife/Machete	2	2.4	1	1.5
Sharp knife/Machete	54	65.0	46	68.7
Shaking of tree	1	1.2	1	1.5
Sickle	26	31.3	19	28.4
Total	**83**	**100.0**	**67**	**100.0**

Figures in parentheses are percentages.

Post-harvest activities carried out vary between the clusters. About 4 percent of farmers break all harvested pods including diseased, infested, infected, unripe and over-ripe with the use of a cutlass; ideally the infected or infested ones should be burnt. Approximately 5 percent of the YLeS did not ensure that the cocoa pods were broken less than 5 days after harvesting. The sub-optimal approach of not sorting the pods after harvesting and before processing affects the quality of the beans in the long run. About 2 percent of farmers in both clusters were not complying with this standard. The heap method was the preferred method for fermenting; about 2 percent of the young farmers' clusters were not complying with this (see table 3).

Table 3
Cocoa post-harvest practices for meeting the FLO standards (Pre-Fermentation)

	OEL-Cluster (N = 83)		YLeS-Cluster (N = 67)	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Method of pod opening				
With Cutlass	51	61.2	50	74.6
With wooden mallet	13	15.7	9	13.4
With wooden club/stick	17	20.5	8	11.9
Striking two pods together		2.4	0	0.0
Total	**83**	**100.00**	**67**	**100.0**
Duration before pod breaking				
Less than one week	83	100.0	64	95.5
More than one week	0	0	3	4.5
Total	**83**	**100.0**	**67**	**100.0**
Sorting before breaking pod				
Sorted	82	98.8	65	97.0
Unsorted	1	1.2	2	3.0
Total	**83**	**100.00**	**67**	**100.0**
Fermentation method				
Heap	83	100.0	66	98.5
Others	0	0.0	1	1.5
Total	**83**	**100.0**	**67**	**100.0**
Fermentation mass				
Turning	83	100.0	65	97.0
Not turning	0	0.0	2	3.0
Total	**83**	**100.0**	**67**	**100.0**

The fermentation practices of farmers in both clusters are sub-optimal; at least 98 percent fermented cocoa for only 5 days. Fermentation usually lasts between 6-8 days depending on

weather conditions and time during the cocoa season. Sub-optimal fermentation which may result from inappropriate methods of fermentation, duration and turning regime will have negative effects on bean quality. Majority of the respondents sun-dried the beans; the surfaces used include tarpaulin and concrete. None of the respondents in both clusters dried their cocoa on wooden platforms while only 1.5 percent of the farmers in YLeS cluster made use of rock surfaces in drying the cocoa beans. Storage practices vary slightly; 89.2 percent of OEL and 95.5 percent of YLeS stored their produce on raised platforms while 10.8 percent and 4.5 percent respectively stored them on bare floor. Storing bagged cocoa beans on raised platforms help to prevent the generation of moisture from the bare floor due to heat and ultimately prevents the growth of fungi which affects the flavor and quality of cocoa. The bagging material used also varies between the clusters; 67.5 percent of the OEL and 53.7 percent of the YLeS stored cocoa in jute bags. Jute bags are preferred due to the fact that it allows for the aeration of the beans while in the store.

Table 4
Cocoa post harvest farm practices for FLO standards (post-fermentation)

	OEL-Cluster (N = 83)		YLeS-Cluster (N = 67)	
	Frequency	Percentage	Frequency	Percentage
Fermentation duration				
5 days	83	100.0	66	98.5
6-9 days	0	0.0	1	1.5
Sun drying				
Tarpaulin	12	14.5	13	19.4
Concrete	71	85.5	53	79.1
Wooden platform	0	0	0	0
Rock	0	0	1	1.5
Other methods of drying				
Over fire	0	0	1	1.5
Oven	0	0	0	0.0
None	83	100.0	66	98.5
Storage method				
Stored on raised floor	9	10.8	3	4.5
Stored on bare floor	74	89.2	64	95.5
Bagging				
None	27	32.5	31	46.3
Jute bags	56	67.5	36	53.7

Challenges of Implementing Fair Trade Certification Standards

Several challenges are encountered by the farmers in a bid to meet certification standards. Most of the farmers in both clusters site finance, pest and diseases as the major problems that they deal with. Some of the respondents claim that the resurgence of certain pests and diseases could be attributed to the change in weather conditions. Some farmers however think that institutional support from the government is poor and serves as a deterrent to going all out in meeting certification standards. The actions taken to resolve the problems include getting loans from their cooperative societies or making specific savings towards the intervention required. Invariably quite a number of farmers purchase chemicals in order to curtail the impact or spread of tests or diseases. It is interesting to note that some of the farmers, particularly the aged ones chose not to take action, resigning to fate as it were.

Table 5: Challenges of meeting cocoa certification standards

Items	OEL-Cluster (N = 83)		YLeS-Cluster (N = 67)	
Challenges	Frequency	Percentage	Frequency	Percentage
Finance	42	51	35	52
Pest and diseases	30	36	23	34
Health challenges	4	5	4	6
Poor level of support from government	7	8	5	8
Efforts to address the challenges				
Borrow Money	5	6	16	24
Increased savings	29	35	35	52
Purchase of chemicals/Pesticides	30	36	10	15
None/Fate	19	23	6	9

CONCLUSION

Farmers are aware of certification standards even though they are not working in close association with any of the certification organizations. Farmers tend to pay more attention to standards related to production activities than to those related to post harvest management. This leads to a leak in the value chain because the sub-optimal activities practiced at the post-harvest stage compromise the quality of the produce. It is therefore important to educate farmers, the YLeS in particular on the importance of meeting post-harvest handling requirements for certification. The nature of the market accessed by farmers shows that the linkage to premium markets is weak leading to poor income; and that the reach of existing institutions which support farmers with these skills and competencies need to be extended to take care of defaults from the standards from production to post-harvest level but more importantly to link them to markets. The need for national institutions responsible for cocoa to be made more effective at the rural level by working with non-governmental organizations that are committed towards enhancing rural people's livelihoods cannot be over-emphasized. Working together with such organizations and certification organizations can make certification more inclusive and a common place norm in cocoa economy. This approach should also be used in enhancing and coordinating the cocoa value chain.

REFERENCES

Adegeye A.J and Ditto J.S (1985) Essential of Agricultural Economics. Impact publishers Nigeria Limited, Ibadan. PP 164-181

Aigbekaen E.O, Dongo L.N, Sanusi R.A, Adeogun S.O and Agbongiarhuoyi E.A. (2009) Study on the risks associated with the farming, production and marketing of cocoa in Nigeria. 15th International Cocoa Research Conference PP 229

CREM (2012) Analysis of environmental, social and economic issues related to the cocoa products consumed in the Netherlands. Report NR.02.578

Dongo L.N, Aigbekaen E.O, Jaiyeola C.O, Emaku L.A and Orisajo S.B.(2009) Influence of farmers' practices on cocoa bean quality: Nigeria field experience. *African Crop Science Conference Proceedings*; Vol 9, pp299-302

Doussou T. (2009) Cocoa and coffee value chains in West and Central Africa: Constraints and options for revenue-raising diversifications. Food and Agricultural Organization of the United Nations (FAO).AAACP paper series- No 3. pp 48.

Fair Trade Foundation, (2011) Fair trade and Cocoa, Commodity briefing august, 2011.

FMR, 2012: Foraminifera market Research (FMR). Cocoa bean export in Nigeria: the feasibility report. November 2012.

Federal Ministry of Agriculture and Rural Development (FMARD)(2011) Agricultural transformation agenda: We will grow Nigeria's Agricultural sector. Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria. 9th September, 2011. Pp 46-48.

Swiss import Promotion Program (2010) Production guidelines for organic coffee, cocoa and tea. Swiss Import Promotion Program, Stampfenbachstrasse 85, CH-8006 Zurich. PP 85. Wikipedia Online

Utilization of Agricultural Transformation Agenda (ATA) Programme Services and Inputs among Rice Farmers in Oyo State, Nigeria

***Adedeji, A.J., Oyesola, O.B., and Janice E. Olawoye**
Department of Agricultural Extension and Rural Development
University of Ibadan, Ibadan, Nigeria
Correspondence Author: odunolaadedeji@gmail.com

ABSTRACT

Rice is an important staple food in Nigeria, which had caused decrease in foreign earnings of the country. In order to ensure food security and improve standard of living of farmers, the government of Nigeria established a transformation agenda for sustainability in the agricultural sector of the economy. Agricultural Transformation Agenda provides services and inputs to farmers. The study thus assessed the utilization of these services and inputs among rice farmers in Oyo state. Multistage sampling procedure was used to sample 145 registered ATA rice farmers from 4 highest rice producing local government areas in Oyo-state. Data were subjected to descriptive and inferential statistical analysis. Results reveals that the average age of the respondents in the study area was 45 years and the standard deviation to be 10.677, they were mostly males (65.0%) and about one third (30.0%) had secondary education with majority (63.0%) cultivating 1-5 hectares of land. More than half (52.0%) had low level of utilization of services and input of ATA. There was a significant relationship between farm area under rice cultivation ($r= -0.28$, $p<0.05$) and the level of utilization of ATA programme services and inputs among rice farmers. It is recommended that government at both federal and state levels should enter in to partnership with rice farmers for increased rice cultivation in bigger hectarage thereby effective utilization of the services and inputs under ATA, increase farmers' outputs and in turn increase their income and subsequently reduce foreign earning spent on rice importation and reduce poverty.

Keywords: Agricultural transformation agenda, Services, Inputs, Rice farmers

BACKGROUND INFORMATION

Agriculture is an important sector of the economy with high potential for employment generation, food security and poverty reduction. In order to unleash the potential of agricultural sector in Nigeria, successive Nigerian governments - both pre and post-independence established different programmes to improve the social and economic status of farmers and to ensure improvement in their agricultural productivity. These included following programmes like : the National Accelerated Food Production project (NAFPP), in 1974; the World Bank-Assisted Development Programmes in 1975; (Operation Feed the Nation - OFN), 1976; the River Basin Development Authorities (RBDs), 1977; Back to Land Programme (BLP) and the Directorate of Food, Roads and Rural Infrastructures (DFRRI), 1988; and the National Land Development Authority (NALDA), 1995. In spite of these various Government policies and programmes, domestic rice production has not kept pace with the domestic consumption increased, high demands for domestic rice that the Nigerian populace request for and, consequently, rice is still being imported (Singh *et al*, 1997).

However, the potential of the agricultural sector has remained largely untapped. This has led to the dwindling performance of the agricultural sector both domestically and in the international trade over the years. Agricultural transformation in some countries has been documented to have significant impact on poverty reduction. Such countries were China, Vietnam, Brazil and Thailand that experienced dramatic growth in their agricultural sectors over the last three decades with annual growth rates of 2.6, 2.0, 1.8 and 1.4 % respectively (FMARD, 2011a). A significant decline in their level of poverty was recorded. During this period, decrease in percentage of population under the poverty line ($1.25) was steady. This resulted in bringing 440 and 24 millions of people out of poverty in China and Vietnam respectively between 1995 and 2005. Brazil and Thailand were also able to bring 14 and 8 millions of people out of poverty between 1985 and 1995. Precisely, China and Vietnam were able to take 40% of their population out of poverty due to aggressive investment and

growth of their agricultural sector. The important lesson learned is that investing in the agricultural sector also developed the rural communities that in turn significantly reduced rural-urban migration (FMARD, 2011a). Countries like India and Thailand invested in agricultural sector and this led to rural community development and reduced rural urban migration (FMARD, 2011a).

Agricultural transformation has had a significant impact in some Africa countries. Malawi became self-sufficient in food production within one year by focusing on agricultural transformation. The country, however, had its worst harvest in 2004. In 2005, the Government implemented one of the most ambitious and successful assaults on hunger in African history in response to the worst harvest experienced. The country launched a national input support programme targeted at small holder farmers. Maize production doubled in 2006 and tripled in 2007 thus enabling Malawi to export 400,000 metric tons of maize to Zimbabwe and 10,000 metric tons of food aid (FMARD, 2011a). In Kenya, Agricultural transformation through private sector was a reality where the private sector driven marketing institutions drove Kenya to the 1st position in the global horticulture market all within 9years. Horticulture value growth and floriculture export growth of 16% per annum and 7% per annum respectively were recorded between year 2000 and 2008 in Kenya. This successfully led to a sea of jobs where eight million jobs were created by the Kenyan horticulture sector, a single sub sector of agriculture (FMARD, 2011a).

As part of the Federal Government of Nigeria's effort to revamp the agriculture sector, ensure food security, diversify the economy and enhance foreign exchange earnings, Agricultural Transformation Agenda (ATA) programme was embarked upon with a focus on the provision and availability of improved inputs (seeds and fertilizer), increased productivity and production, as well as the establishment of staple crop processing zones, to address reduction in post-harvest losses, improving linkages with industry with respect to backward integration, as well as access to financial services and markets (FMARD, 2011b). Rice has become a very important staple to most people in Nigeria and a large proportion of the commodity consumed in the country is imported (Adeola, Adebayo and Oyelere, 2008). Rice transformation plan which is a component of ATA programme is set to make Nigeria a self-sufficient nation in rice in a manner that grows the agricultural sector and also generates employment.

Despite the important role rice plays in the diet of Nigeria, rice production in Oyo state was being faced with myriads of problems. Daramola (2005) asserts that the key problems facing the rice farmers in addition to lack of improved varieties is that of scarcity and high input costs. This has led to farmers not using inputs such as fertilizers and other agrochemicals and those who use them use sub – optimal proportions of the inputs resulting in low and poor quality yields. There has been limited awareness of the use of improved seed, coupled with poor distribution channels, poor seed quality and adulteration of seed (FMARD, 2011b), presence of unskilled professionals, management problems, absence of suitable motivational factors, slow pace of rural infrastructural development, socio-economic bottle-necks, political considerations, low extension agent- clientele ratio, logistic problems, as well as general lack of commitment on the part of extension stake-holder (Asiabaka, 2002). There are also marketing problems that result in middlemen not paying prices that are attractive enough to keep the farmers producing.

Beyond the farm gate, there are issues like the absence of standard measures in the marketing of farm produce including rice. Transportation is another serious constraint for the conveyance of rice to the mills or markets. Obsolete and inefficient rice processing technology and storage facilities lead to smelling and unappealing products and presence of stones. Most of the rural farmers do not enjoy tractor hiring services like harvesting, spraying, ridging and harrowing. It is against this backdrop that this research paper examined utilization of Agricultural Transformation Agenda (ATA) Programme services and inputs among rice farmers in Oyo State, Nigeria by providing answers to the following questions.

- What are the socio- economic characteristics of the rice farmers in the study area?
- To what extent are farmers utilizing the services and inputs of ATA programme?

METHODOLOGY

Area of study

The study was carried out in Oyo State.Oyo State is located in the South-West geopolitical zone of Nigeria. Oyo State has an equatorial climate with dry and wet seasons and relatively high humidity, the dry season lasts from November to March while the wet season starts from April and ends in October. Average daily temperature ranges between 25 °C (77.0 °F) and 35 °C (95.0 °F), almost throughout the year. The climate in the State favours the cultivation of crops like Maize, Yam, Cassava, Millet, Rice, Plantain, Cocoa, Oil Palm and Cashew.

The population of the study comprises of ATA registered rice farmers in Oyo state. A multi-stage sampling procedure was employed for the study. The first stage was purposive selection of 15% of the 27 Local Government Areas (LGAs) where

rice is cultivated to give four LGAs which were: Atiba, Ido, Ona-Ara and Lagelu. In Atiba there are 122 registered rice farmers, Ido has 67 registered rice farmers while Ona-Ara and Lagelu have 60 and 41 registered rice farmers respectively. The second stage was random selection using sampling proportionate to size of rice farmers in the selected local government area to give 61, 34, 30 and 20 respondents in Atiba, Ido, Ona-Ara and Lagelu respectively and a total of 145 registered rice farmers as sample size. Data was obtained through interview schedule that sought information on respondents' socio-economic characteristics, and utilization of ATA programme services and inputs by rice farmers. 10 items made up ATA services and inputs, 3 items for ATA services and 7 items for ATA inputs, each of the item was assigned score 1 to 10, 3 categories of scoring was used for availability and accessibility of ATA services and inputs respectively, Always=2 Occasionally=1 and Never=0. The maximum obtainable score for availability of ATA services and accessibility of ATA services was 6 and the minimum score was 0 respectively. The maximum obtainable score for accessibility of ATA inputs and accessibility of ATA inputs was 14 and the minimum obtainable score was 0 respectively. Utilization of ATA programme services and inputs were measured by pulling together the scores for availability of the services and inputs and the accessibility of the services and inputs.

RESULTS AND DISCUSSION

Rice farmers' socio-economic characteristics

Result in Table 1 shows that 24.8% and 28.3% of rice farmers fell within the age range of 30-39 years and 40-49 years respectively. This suggests that the farmers are young, active and had potential for farming. These findings suggest that rice farmers are in their economic active age. The registered ATA farmers are younger compared to general farming population which is growing older. Hamidu, Murtala, Illiyasu and Adamu, (2006) reported that young active farmers are more willing to adopt and practice new agricultural technologies than the older farmers. These farmers therefore can make meaningful impact in agricultural production when adequately motivated with the needed services and inputs. Table 1 further reveals that 64.8% of the rice farmers were male while the remaining 35.2% were female. The proportion of registered male to female was 6:4. This suggests that there are more male registered rice farmers. This is in accordance with Ogunsumi, Ajayi, Amire and Williams (2013) that there are more male rice farmers involved in rice production compared to female rice farmers. The findings also suggest that females are also stakeholders when it comes to rice production.

More than half (55.9%) of the rice farmers were married, 20.0% were single. Others were divorced (15.9%), separated (5.5%) and widowed (2.8%). It can be deduced from the marital status of the rice farmers that they are family men and their wives and children help in supplying the needed labour, particularly in an agrarian community where hired labour may be scarce and costly during the farming season. This corroborates with Akinbile (2007) that the effects of marriage could enhance the release of family labour, thus making more hands available for productive activities on the respondent's farm. It is also in accordance with Nwanebo (2012) that marriage is perceived as a very essential factor for facilitating household farming and productive activities. It can be deduced from Table 1 that 51.7% of the rice farmers had family size between 1 and 5 and 43.4% had their family size between 6 and 10. Sule, Ogunwale and Atala, (2002) reported that family size has a great role to play in family labour provision in agricultural sectors. This implies that number of people in the family helps in improving farming activities thereby increasing farm outputs.

Majority of the rice farmers (63.4%) had between 1 and 5 hectare of land under rice cultivation while 27.6% had 6 and -10 hectare. Majority of the respondents are thus small holders and this limits their production potentials. They fall into the category of farmers described as subsistence farmers in the context of ATA. This also suggests that farmers are ready to commit a sizeable portion of their land to practicing rice farming if they have the resources.

Table 1 indicates that 38.6% of the rice farmers had primary education, 29.7% had secondary education and 13.1% had tertiary education while 18.6% had no formal education. This implies that majority of the respondents are literate. This will enhance agricultural development, because improved practices, as they unfold from researches will be better disseminated, understood and adopted. Oladeji (2011) confirmed that farmers had one form of educational qualification or the other. Also, Ogunleye (2002), observed that majority of farmers in the southwestern had secondary or primary education. The educational attainment among rice farmers could enhance their adoption of innovations as it is being unveiled by government in order to improve the social and economic status.

Level of availability and accessibility of ATA services and inputs to rice farmers

Considering ATA services, it can be deduced from table 2 that extension services were always available to 55.2% of the rice farmers followed by financial services which was always available to 33.8% of the rice farmers and financial services is

available occasionally for 48.3% of the rice farmers. Tractor hiring services was not available to more than half of the rice farmers (51.7%). More than half of the rice farmers had access to extension services occasionally and 42.1% had access to extension services always. More than half of the rice farmers (52.4%) never access tractor hiring services while 43.4% accessed the tractor hiring services occasionally. While more than one third (35.2%) had access to financial services always while only 36.6% had occasional access to financial services.

Considering ATA input, fertilizer was always available to 58.6% of the rice farmers; rice seed was always available for 35.2% of the rice farmers. Rice seed was available occasionally for 47.6% of the rice farmers and sprayer was occasionally available to 41.4% of the rice farmers. Storage bags and farm implement were never made available to more than half of the rice farmers. While 40.7% always had access to fertilizer; more than half of the rice farmers (53.8%) had access to rice seeds occasionally and fertilizer was accessed occasionally by 44.8% of the rice farmers. More than half of the rice farmers (62.8%) did not have access to farm implements, fungicides and insecticides. This implies that effort made by ATA programme planner to make services and inputs available is recording success but the level at which it is accessible differs at the grassroots while some are accessing some services and inputs some do not have access.

Table 1
Distribution of rice farmers based on their socio-economic characteristics

Variables	Frequency	Percentage	Mean
Age			
20-29	15	10.3	
30-39	36	24.8	45
40-49	41	28.3	
50-59	21	14.5	
60-69	26	17.9	
70-79	6	4.1	
Sex			
Male	94	64.8	
Female	51	35.2	
Marital Status			
Widow	4	2.8	
Separated	8	5.5	
Divorced	23	15.9	
Married	81	55.9	
Single	29	20.0	
Family size			
1-5	75	51.7	
6-10	63	43.4	5.88
11-15	5	3.4	
15-20	2	1.4	
Area under rice cultivation (hectare)			
<1	8	5.5	
1-5	92	63.4	
6-10	40	27.6	4.33
11-15	2	1.4	
16-20	1	0.7	
21-25	2	1.4	
Educational qualification			
No formal education	27	18.6	
Primary education	56	38.6	
Secondary education	43	29.7	
Tertiary education	19	13.1	

Table 2
Distribution of rice farmers by level of ATA services and input availability and accessibility

	Level of availability			Level of accessibility		
ATA Services	**Always**	**Occasionally**	**Never**	**Always**	**Occasionally**	**Never**
Extension services	80(55.2)*	54(37.2)*	11(7.6)*	61(42.1)	75(51.7)*	9(6.2)*
Tractor hiring services (ridging, harvesting, spraying, harrowing)	13(9.0)*	57(39.3)*	75(51.7)*	`6(4.1)*	63(43.4)*	76(52.4)*
Financial services(NAICB, Micro finance, State Agric credit)	49(33.8)*	70(48.3)*	26(17.9)*	51(35.2)	53(36.6) *	41(28.3)*
ATA Inputs						
Insecticides	30(20.7)	50(34.5)	65(44.8)	11(7.6)	59(40.7)	75(51.7)
Sprayer	20(13.8)	60(41.4)	65(44.8)	24(16.6)	55(37.9)	66(45.5)
Rice seeds	51(35.2)	69(47.6)	25(17.2)	34(23.4)	78(53.8)	33(22.8)
Storage bags	6(4.1)	47(32.4)	92(63.4)	5(3.4)	36(24.8)	104(71.7)
Farm implements (sprayer, watering can)	14(9.7)	44(30.3)	87(60.0)	11(7.6)	43(29.7)	91(62.8)
Fertilizer	85(58.6)*	43(29.7)*	17(11.7)*	59(40.7)	65(44.8) *	21(14.5)*
Fungicides	18(12.4)	47(32.4)	80(55.2)	17(11.7)	47(32.4)	81(55.9)

Figures in parentheses ( )* are percentages

Data in Table 3 shows that level of utilization of ATA services and inputs was low for 52.4% of rice farmers. It suggests that the services and inputs of ATA programme and services are available but the level of utilization is low. This data suggests that non-availability and access to ATA services and inputs on the part of the registered rice farmers were due to programme implementers not making the inputs and services available and accessible to the farmers.

Table 3
Categorization of respondent based on level of utilization of ATA programme services and inputs

Categorization	Freq	Percentage
Below mean < or = 13.69	76	52.4
Above mean > 13.69	69	47.6

Correlation analysis of rice farmers' selected socioeconomic characteristics and utilisation of ATA service and input

The result of the Pearson Product Moment Correlation Coefficient (PPMC) in Table 4 reveals that there was a significant relationship between farmers' age (0.001) and utilization of ATA services and inputs at p<0.05. There was also a negative relationship between area under rice cultivation and utilization of ATA programme services and inputs at r= -0.28. The implication of the significance relationship between farm area under rice cultivation and utilization of ATA programme services and inputs is that as farm area under rice cultivation increases, utilization of services and inputs decreases meaning the ATA programme services and inputs are not enough for the farmers.

Table 4
Correlation of selected socio-economic characteristics (Age, family size, area under rice cultivation) and utilization of ATA services and inputs

Variable	r-value	p-value	Decision	Remark
Age	0.001	0.99	Not significant	Accept H_0
Family size	-0.13	0.13	Not significant	Accept H_0
Area under rice cultivation	-0.28	0.001**	Significant	Reject H_0

CONCLUSION

The study concludes that rice farmers are within the economic active age and have formal education. Most of the rice farmers operate at subsistence level. This is reflected in the area of land farmers used in cultivating rice. It was also concluded that there are more married individual among the rice farmers. ATA programme services and inputs are available while the rate of accessibility differs among the rice farmers as some have access while some do not have access. The level of utilization of ATA programme services and inputs was low. A significant relationship existed between area under rice cultivation and the utilization of ATA services and inputs among rice farmers. They utilize ATA programme services and inputs that were meant for them but the rate at which they utilize the programme services and input is low.

RECOMMENDATION

Based on the conclusion it is recommended that

- Strong collaboration should be forged between federal, state, local governments, private organization providing extension services and agro chemical and inputs companyin making services and inputs available and accessible to rice farmers.
- Federal and State levels should enter in to partnership with rice farmers for increased rice cultivation in bigger hectarage.

REFERENCES

Adeola R., Adebayo O., and Oyelere G. (2008) Effects of the Federal Government Special Rice Programme on rice yields and farmers' income in Oyo State. *International Journal of* Agricultural Economics & Rural Development - 1 (1): Pp1-6.

Akinbile, L.A.(2007) Determinants of productivity level among rice farmers in Ogun State,

Nigeria. African Crop Science Conference Proceedings, printed in El-Minia, Egypt. African Crop Science Society. Vol. 8. Pp. 1339-1344.

Asiabaka, C.C. (2002) Agricultural Extension. A Handbook for Development

Practitioners. Molsystem United Services. Omoku, RiverState: (1-160).

Daramola B. (2005)Government policies and competitiveness of Nigerian rice economy. A

Paper presented at the `Workshop on Rice Policy & Food Security in Sub-Saharan Africa' Cotonou, Republic of Benin, November 07-09, 2005.

Federal Ministry of Agriculture and Rural Development (FMARD) (2011a)Agricultural Transformation Blue Print, Federal Ministry of Agriculture and Rural Development. Abuja, Nigeria.

Federal Ministry of Agriculture and Rural Development (FMARD) (2011b) Rice Transformation Project Proposal. Executive summary, Federal Ministry of Agriculture and Rural Development. Abuja, Nigeria.

Hamidu B.M., Murtala, N., Illiyasu, A.Y. and Adamu I.P. (2006) Assessment of

theadoption ofafforestation innovation in Dambatta Local Government Area, ofKano State. *Journal of Agricultural Extension* Vol. 9, pp.51-62.

Nwanebo C. (2012) Factors associated with Sweet Potato Production among Rural Farmers in Imo State. (Unpublished Master's Thesis). Department of agricultural extension and rural development,University of Ibadan, Nigeria.

Ogunleye, K.Y. (2012) Production and marketing performance of farmers participating in cassava initiative in Nigeria. An Unpublished PhD thesis in the Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ibadan.

Ogunsumi L., Ajayi A., Amire C. and Williams S. (2013)Sustainability of Agricultural Transformation Agenda: The Place of Rice Farmers in Ogun State, Nigeria. *Research on Humanities and Social Sciences, 3*(13), 2222-2863.

Oladeji, J.O. (2011) Farmers Perception of Agricultural Advertisement in Nigerian Newspapers in Ibadan Municipality, Oyo State, Nigeria. *Journal of Media and Communication Studies*. Vol. 3 (3): 97-101.

Singh, B.N., S. Fagade, M.N. Ukwungwu, C. Williams, S.S. Jagtap, O. Oladimeji, A. Efisue and O. Okhichievbie (1997) 'Rice Growing Environments and Biophysical Constraints in Different Agroecological Zones of Nigeria. *Meteorological Journal*.,21: 34- 44.

Sule, A.M, Ogunwale S.A., and Atala T.K. (2002) Factors affecting adoption on fishing innovation among fishing entrepreneur in Jebba Lake Community. *Journal of Agricultural Extension* Vol. 6: 48-60.

Use of Information and Communication Technologies (ICTs) among National Agricultural Researchers in Southwest, Nigeria

Oladeji, J.O., Sangotegbe, N. S. and Aina, B.
Dept. of Agricultural Extension and Rural Development,
University of Ibadan, Ibadan, Nigeria
loisdaddy@yahoo.com and siji004u@yahoo.com

ABSTRACT

The effective utilization of scientific and technological findings is the main crux in achieving meaningful development. The advancement of agriculture depends on effective extension delivery which is fundamentally agricultural communication. This study examined the current state of the use of information and communication technologies by the national agricultural researchers in Southwest, Nigeria. A total of 150 researchers across selected research institutes in Southwest Nigeria were sampled for the study. However, only 119 research instruments were returned and used for data analysis. Findings reveal that majority (54.0%) had 1-5 years of research experience, 86.0% were the senior cadre officers, with an average age of 38 ± 4.5 years. While computer was mostly (93%) used among electronic ICT, print media, journal (87%) was mostly used among printed ICT. Computers (77.0%), Telephone (75.0%) were used on daily basis while Journals (87.0%) and Posters (49.0%) were only used when available. Respondents' rank in the organizations (χ^2 = 6.8139, p = 0.0331) had a significant relationship with their use of ICTs for agricultural research and development while no significant relationship was established between the perceived importance of ICT and their use of ICTs for agricultural research and development. Well-funded ICTs department and infrastructure will promote the use of ICTs among agricultural researchers.

Keywords: Information and Communication Technology, Agricultural Researchers, Research and Development.

INTRODUCTION

Information is a major prerequisite for agricultural development and as noted by Adebayo, Adesope and Agumagu (2006) that when the right type of information is disseminated to the end users through the appropriate channel and in the right amount, meaningful progress will be made in agricultural development. Information and communication technologies contribute to improved agricultural research by enabling sharing and exchange of research data and information electronically and in managing agricultural research for greater efficiency and effectiveness. Agricultural research and development institutions are the channels through which newly developed technologies are disseminated. The Nigerian National Agricultural Research System (NARS) focuses on development efforts through strengthening of research supply by providing infrastructure, capacity management and policy support at the national level. Information creation, sharing and utilisation are vital ingredients to empower the poor to make the right decisions.

The use of Information and Communication Technology (ICT) will bring about a transformation of agriculture through the use of adequate innovation that is largely enabled through information sharing. It will also bring about an exchange between agricultural stakeholders through ICTs-enabled information systems (Maru 2008). Building agricultural productivity and food security will require new and improved technologies, broad dissemination of newly developed and existing technologies as well as introduction of support services for improving farm yield. This is important in order to meet the challenge of feeding the consistently increasing population and it will necessitate the use of ICTs (Bientema and Stads, 2004). Where the services and technologies needed for improved production are not available to farmers, their productive performance will remain low.

Aina (1990) noted that the agricultural research information system in Nigeria is characterised by very few avenues for reporting research findings. According to the International Institute of Communication Development (IICD), ICTs have a great potential to enhance agricultural production, improve market access, aid capacity building and empower producers. Information and communication technologies offer a common ground for interaction among all segments of the agricultural system, crossing barriers posed by geographical, cultural and bureaucratic bottlenecks and shortens the gap and distance between members of the agricultural system. However, Aina, Kaniki and Ojiambo

(1995) and Oladele (2011) asserted that agricultural researchers' access to information through agricultural indexes, abstracts, databases in agriculture are only available in few libraries and documentation centres.

However, when ICTs are employed in the agricultural research and development system, there will be acceleration in agricultural development since the system depends on effective communication of the stakeholders in the sector. Communication using ICTs will bring about an increase in the efficiency and effectiveness of knowledge transfer and its utilization by all the players in the sector. However, poor flow of information both within government institutions and between the institutions and their stakeholders have resulted in ineffective research processes. When these institutions lack access to information about their clients and their needs, as well as knowledge about broader social and economic developments, they make short sighted decisions. Also, weak information, communication and knowledge flow bring about poor performance of markets and institutions resulting in reduction in economic growth for the economy. The sparseness of information on the use of (ICT) for agricultural research and development in Nigeria brings to fore the relevance of this study and it is against this background that this study sought to provide answers to the following questions:

1. What is the ICTs usage of agricultural researchers for research and development in South Western, Nigeria?
2. What is the perceived importance of agricultural researchers' ICT knowledge and skill needs for job efficiency?

METHODOLOGY

The study area is South-Western Nigeria. The population comprises the agricultural research institutes that have either their headquarters or sub-stations located in the zone. Multi stage sampling procedure was used to select the sample for the study. There are 11 research institutes in the south western Nigeria. They include Cocoa Research Institute of Nigeria (CRIN), National Horticultural Research Institute (NIHORT), Nigerian Stored Products Research Institute (NSPRI) and Nigerian Institute for Oceanography and Marine Research (NIOMR). Others are Institute of Agricultural Research and Training (IAR&T) and Nigerian Institute for Oil Palm Research (NIFOR). Fifty percent (6) of the institutes was randomly selected and a representative sample of agricultural researchers were randomly selected from each institute. They include Cocoa Research Institute of Nigeria (CRIN), National Horticultural Research Institute (NIHORT), Nigerian Stored Products Research Institute (NSPRI) and Nigerian Institute for Oceanography and Marine Research (NIOMR). Others are Institute of Agricultural Research and Training (IAR&T) and Nigerian Institute for Oil Palm Research (NIFOR). A total of 150 researchers were then sampled across the selected Institutes, but only 119 questionnaires were returned and used for analysis

Measurement of variables

Variables considered in this study included:

- Researchers' use of ICTs in research and development

This was operationalized by asking the researchers to indicate whether they use any of the listed types of ICTs with response options of Yes or No with scores of 1 and 0, respectively. The frequency with which they use the ICTs was also determined as Daily (3), Weekly (2), Monthly (1), wherever possible (0).

- Researchers' perceived importance of their ICT knowledge and skill needs

  This is based on ten items using a four-point scale of Very Important, Important, Least Important and Not important with scores of 3, 2, 1 and 0, respectively.

RESULT AND DISCUSSION

Years of involvement in agricultural research among respondents ranged from 1-20 years. Majority of the respondents (54%) had 1-5 years of research experience with only 14 % having above 15 years experience. Majority (86 %) of the respondents were senior cadre officers. This is supported by Kenny (2002) who noted that majority of internet users possess a university degree, majority (95 %) are below 50 years and the mean age of the respondents was 38 years. Oladeji (2010) revealed that the average age of public and private extension personnels in Oyo State, Nigeria were 44.0 and 32.0 years respectively. Only 19.3% of the respondents were females (Table 1). This corroborates the findings of Oladeji (2010) and Oladeji and Oyesola (2011) who reported small number of females among private agricultural organization workers and agricultural extension personnel respectively in Oyo State

Table 1
Frequency distribution of the personal and work characteristic of researchers

Personal and workFrequency	Percentage (%)	
Highest Level of Education		
HND	12.08	
B.Sc	25	21.01
M.Sc	65	54.62
Ph.D	17	14.29
Rankinorganization		
Junior	3	2.52
Middle	13	10.92
Senior	103	86.55
YearsofExperience		
1-5	65	54.62
6-10	27	22.69
11-15	10	8.40
>15	17	14.29
Age (Years)		
20-30	20	16.81
31-40	54	45.38
41-50	37	31.09
>50	8	6.72
Sex		
Male	87	73.11
Female	32	26.89

The result on the use of information and communication technology by agricultural researchers from Table 2 indicates that use of computers by the researchers had the highest frequency (93.0%) with the fax machine having the least (10.0%). Mehdi (2009) asserted that interaction between organizations, governments, and communities have been revolutionized by the advent of the internet. The result also agrees with Akinbile and Alabi (2010) who reported a low usage of fax among fish farmers in Oyo State. This difference can be attributed to relevant progress in the accessibility and utilization of electronic ICTs in these modern days than before. This confirms the findings of Otitolaye (2006) who reported that the most important factors considered by respondents in the use of communication channels for information dissemination was cost of use and accessibility. Among the print media, Journals (87.0%) enjoy the highest patronage by researchers, while posters had the least patronage of 5.1%. This is line with Oladeji, Bolarinwa and Ladokun (2010) who reported high usage of the print media among poultry farmers in south western Nigeria. The table also indicated that on the frequency of use of ICTs, those used on a daily basis by researchers include computer (77.0%), telephone (75.0%), television (68.0%) and radio (66.0%), while those that do not have specific pattern of use, but were used only when available are posters (49.0%), journals (87.0%), projector (42.0%) and newsletter (40.0%). This result agrees with Akinbile and Alabi (2010) who reported a high level of use of radio among fish farmers in southwestern Nigeria. The high use of information and communication technology among the respondents had a positive correlation with improved capacity to disseminate relevant information to farmers that could enhance their production.. This implies that the use of these ICTs among researchers must translate to adequate delivery of information to the farmers who are the recipient of research findings.

Table 2
Distribution of respondents on their use of ICTs and estimated number of hours of use per week

ICTs	Frequency of use				Average no. of hours
	Daily	Weekly	Monthly	Anytime available	spent/week
Radio	66.4	3.4	0.0	16.0	7.89
Television	68.9	3.4	0.0	12.6	11.55
Newspapers	58.0	10.9	0.8	16.8	3.94
Journals	16.0	21.9	10.9	38.7	3.15
DVD/CD	17.0	5.9	3.4	35.3	2.96
Telephone	75.6	3.4	0.8	6.7	17.53
Computers	77.3	10.1	1.7	4.2	16.50
Internet	48.7	21.0	2.5	19.3	13.95
Fax	0.8	0.8	0.0	9.2	4.34
e-mail	34.5	28.6	5.0	20.2	8.32
Video	11.8	13.5	4.2	33.6	6.39
Projector	0.0	2.5	7.6	42.9	1.16
GIS	2.5	0.0	1.7	12.6	4.25
Posters	1.7	4.2	2.5	49.6	1.89
Bulletin	0.0	9.2	6.7	45.4	1.23
Newsletters	5.0	7.6	16.8	40.3	1.54

*Figures in parentheses are percentages

Results on their perceived importance of ICT knowledge and skills needs for job efficiency reveals that most of the researchers perceived infrastructural needs such as electricity (93.3%), connectivity (84.0%) as very important (Table 3).

Table 3
Distribution of respondents according to their perceived importance of ICT knowledge

Needs	Very important	Important	Least important	Not used
Provision of internet connectivity	100(84.03)	8(15.13)	1(0.84)	-
Provision of adequate power supply	111(93.28)	7(5.88)	-	1(0.84)
Increased provision of electronic resources	80(67.23)	37(31.09)	1(0.84)	1(0.84)
Establishment of a digital library	84(70.59)	31(26.05)	2(1.68)	2(1.68)
Establishment of a national research information databank for agriculture	80(67.23)	37(31.09)	2(1.68)	-
Training in publishing of research Findings via ICTs	73(61.34)	40(33.61)	4(3.36)	2(1.68)

*Figures in parentheses are percentages

Chi square analysis on researchers' personal characteristics and use of ICT (Table 4) reveals that only rank in the organizations (χ^2 = 6.8139, p = 0.0331) had a significant relationship with respondents' use of ICT for agricultural research and development. This is expected as the researchers on the higher ranks may be more educated and exposed on the use of ICT, and thereby enhancing their use of such ICT. This partially agrees with Oladeji (2010) who reported that farmers with high level of education used ICT more than those with low level of use. On the other hand, no significant relationship was established between the perceived importance of ICT (χ^2 = 0.0020, p = 0.9640) and their use of ICTs.

Table 4
Chi square analysis of the relationship between selected variables of the researchers and their use of ICTs for research and development

Variables	χ^2	DF	P-Value	Decision
Educational level	5.1501	5	0.3978	Not Significant
Rank in organization	6.8139	2	0.0331	Significant
Years of research experience	3.6788	4	0.4512	Not Significant
Age	1.0717	4	0.8987	Not Significant
Sex	0.4790	1	0.4889	Not Significant
Perceived importance of ICT	0.0020	1	0.9640	Not Significant

CONCLUSION AND RECOMMENDATION

The study ascertained that the ICTs explored for research related purposes included the internet, e-mail, telephone and print media. Also, lack of infrastructures such as electricity, poor internet connectivity for improved research and development were perceived as important training needs and skills for job efficiency. Therefore, in order to promote the use of ICTs for research and development among researchers in the study area, there is need to provide well funded ICT departments and infrastructures and put in place a policy of training in the use of ICTs resources that will enable researchers to be better equipped to use the technologies as they evolve for productive work.

REFERENCES

Adebayo, E.L., Adesope, O.M., Agumagu, A.C. (2006) Comparative analysis of female extensionists and researchers' attitude towards information and communication technology in South western Nigeria. *Asian journal of information technology. 5 (12).* Pp1389-1393.

Aina, L. O, Kaniki, A. M and Ojiambo, J. B.(1995): Agricultural information inAfrican Third world information services Ltd. Ibadan, Nigeria. Pp 23

Aina, L. O. (1990) Informing African farmers: Some obstacles to information flow. *Information Development*, 1 (6): 201-203.

Akinbile L.A. and Alabi O. E. (2010) Use of ICTs among Fish Farmers in Oyo State. *Journal of Agricultural Extension.* Vol. 14 (1)

Bientema, N.M., and Stad, Gert-Jan. (2004) 'Sub Saharan African agricultural research: recent investment trends'. *Outlook on agriculture* Vol. 33, No 4. http//www.aasti.cgiar.org/pdf/outlook.pdf. Accessed 12/07/2008. Pp 239-246.

Maru, A. and Pesce, V. (2008)'Adoption of information and communication technologies in agricultural research for development' for Global Forum on Agricultural Research (GFAR).

Medhi K. (2009) Internet based information delivery for farming community. Session IV, pg 12

Oladeji J. O. (2010) Information and Communication Technology (ICTs) by Public and Private Extension Agencies in Oyo State, Nigeria. *Journal of Agriculture, Forestry and the Social Sciences (JOAFSS)*, Vol 8. No. 2.

Oladeji J. O. and Oyesola O. B. (2011)The Use Information and Communication Technology (ICTs) among Private Agricultural Organization Workers in Oyo State. *Journal of Agricultural and Food Information.* Volume 12: 258-269.

Oladeji, O. Bolarinwa, K. K. and Ladokun, B. (2010)Use of Information and Communication Technology to Boost Poultry Production in South Western Nigeria. *Nigeria Poultry Science Journal* 7: 75-83.

Otitolaye O.O. (2006) Assessment of Extension Agents' Knowledge in the Use of Communication Channels for Agricultural Information Dissemination in Ogun State. An Unpublished B.Sc. thesis, University of Ibadan. Pp. 2, 10, 11.

Programme Format Preferences of Rural Development Broadcasters and Listeners in Southwestern Nigeria

Badiru, I. O. and Yekinni, O. T.
Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan, Nigeria
Corresponding Author: bodebadru@gmail.com
Tel: +2348034660732

ABSTRACT

Convergence in rural development broadcast format preferences among broadcasters and listeners is crucial to enhancing listenership of rural development broadcasts. This study investigated broadcasters and listeners' format preferences in southwestern Nigeria. Thirty broadcasters and 438 listeners were administered with questionnaires. Data were collected on commonly used programme formats and respondents' preferences. Lecture, interview, news and group discussion were the commonly used formats. Broadcasters preferred lecture format (95 points) to interview format which was preferred by the listeners (1073 points). There were significant differences in the preferences of broadcasters and listeners for lecture ($t = -3.007$, $p < 0.05$) and group discussion formats ($t = 5.006$, $p < 0.05$). Rural development broadcasters should continue using the interview format due to its preference by the listeners.

Key words: *rural development communication, preference convergence, formats, listenership*

INTRODUCTION

Rural development is more than the development of the physical environment. A holistic approach to its development revolves around the rural man who the development is actually meant to benefit. His well-being is the essence of the development process, and systems are therefore, evolved to enhance his well being. One of such systems is that of communication which is manifested in the form of development journalism.

The basic assumption behind the evolution of development journalism is that it can influence the development process by reporting development programmes and activities. Therefore, in line with the Gandhi model, development journalism is meant to service the people (Kumar,2012).

As an aspect of development journalism with specific reference to agriculture, the rural areas and their inhabitants, rural development broadcasting can be defined as that aspect of broadcasting which is specifically designed to promote an all-inclusive improvement in the lives and livelihoods of farmers and other rural dwellers. Thus, the mass media have become an important means of agricultural and rural development information dissemination in Nigeria. While their role is largely supportive, it has become highly germane due to the need to enhance the performance of the extension delivery system. In line with this thinking, some Agricultural Development Programmes (ADPs), in addition to having Village Extension Agents (VEAs) on the field also run agricultural and rural development programmes on the mass media.

Radio is one of the most efficient means of dissemination of knowledge, information and technologies to ease the adoption of innovation. Due to its importance and advancement in technology, radio to person ratio in Africa had improved from 1: 124 in 1955 to 1: 5 in 1995 (Sitawa Ogutu, Ngunjiri and Chege, 2012). Ojebode (2002) noted that the medium whose support is most coveted for development communication is radio due to its enabling characteristics i.e.; it is battery-powered, which means the usual failure or lack of electric power is not an impediment to the listener, radio is cheap and portable and it is found in the remotest part of the world.

Considering the potentials of the radio in agricultural and rural development, efforts targeted at optimising its use are welcomed. Therefore, all variables involved in its use deserve being scrutinised for the purpose of being made more effective.

According to Yahaya (2003), communication only becomes effective when the encoded message is accurately decoded by the receiver. In ruraldevelopment broadcasting, the presenter does not only want to pass his message across, he also wants to retain the attention of the listener and eventually persuade him to act on the message. This requires the use of appropriate programme formats which appeal to the listening pleasure of the audience without compromising the integrity of the technical information being relayed. A convergence in the preference for programme format between broadcasters and listeners therefore becomes an important variable worthy of consideration in this light.

According to Information and Communication for Development ICD (2004), the choice of a format

used by a broadcaster depends on a number of key factors which include; who the broadcaster intends to target, available financial resources, technical and creative capacity; the cost, complexity and skill required to produce the format and availability of useful and useable information. They listed popular radio formats used in health development journalism to include spots and slogans, mini-dialogues and dramas, soap operas and serials, stories and testimonies, magazines, talk shows and phone-ins as well as news, documentaries and health journalism. Moreover, Ojebode (2003) listed 10 programme formats for promoting development in Nigeria radio stations to include news formats, group discussion, lecture or straight talk, interviews and testimonials. Others are entertainment, magazines, jingles, spot announcements and ewi (poetry).

According to National Association of Farm Broadcasting (2011), the news format is the most commonly used format among agricultural broadcasters in the United States of America followed by the country format. Yahaya (2003) reported that soap operas and serials formats have been found to have great potential in development communication in Latin America. In Nigeria, documented evidence on programme formats used in rural development broadcasting is scanty. Moreover, efforts at achieving better listenership among the programme audience demand that the most suitable and appropriate format be utilised for optimum result. Hence, there is need to investigate the use of rural development broadcastformatsin the study area as well as the preferences of rural development broadcasters and listeners for such formats in order to recommendpreferred ones for use thusenhancingthe listenership of rural development broadcasts and by extension, their sustainability.

This study was therefore, designed to investigate rural development broadcasters and listeners' programme format preferences in Southwestern Nigeria. The specific objectives were;

1. To examine the personal characteristics of the rural development broadcasters and listeners;
2. To describe the orientation of the rural development broadcasts in the study area;
3. To ascertain the commonly used programme formats for rural development broadcasts;
4. To investigate the most preferred programme format by rural development broadcasters and listeners;
5. To compare the programme format preferences of rural development broadcasters and listeners in the study area.

METHODOLOGY

The study was carried out in Southwestern geopolitical zone of Nigeria which comprises Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States. A list of 50 rural development broadcasters who are currently presenting programmes on radio in three of the states (Ogun, Ondo and Oyo) was generated out of which 40 were randomly selected for the study and administered with questionnaires. A total of 30 questionnaires were however returned and analysed.

A multistage sampling technique was used to select rural dwellers to serve as the second category of respondents for the study. One senatorial district was selected from each of the three selected states using a simple random sampling technique to achieve 33.3% sample proportion while one rural local government area was selected from each of the selected senatorial districts using simple random sampling technique. From each local government area, three wards were selected using the simple random sampling technique, while one community was in turn selected from each selected ward using the simple random sampling technique. Fifty respondents were selected from each ward making a total of 450 respondents. However, 438 of the returned research instruments were found good enough for analyses.

Measurement of variables

Rural development broadcasters and listeners' preferred programme formats were measured by asking respondents to list commonly usedrural development broadcast formats which were later ranked based on their preferences. The ensuing ranks were then assigned weights such that the format ranked first was scored highest and the least ranked scored least. These were later summed up to arrive at points for each programme format. The format with the highest point was then ranked as first while the one with the least point ranked last. They were equally asked to design a mix of programme format that they prefer most. For instance, individual ranking by the respondents was assigned a weight, each rank of 1st was awarded 4 points, 2nd was awarded 3 points, 3rd awarded 2 points and 4th awarded 1 point. The points were then computed for all the respondents to arrive at the total points calculated while the highest point was ranked 1st, the second highest; 2nd and so on. In addition, information on personal characteristics was elicited by asking the respondents to provide information on their sex, age, highest educational attainment and academic background etc.

RESULTS AND DISCUSSION

Personal characteristics of rural development broadcasters and listeners

Table 1a shows that majority of the rural development broadcasters were male (70.0%) while 30.0% were female. This showed that the field of rural development broadcasting is male dominated; a situation which may create an imbalance in the reporting of gender related issues if not properly managed. However, it may also suggest that there is a gap to be filled by the females. This is not far from the findings of Lawanson (2008) which reported that men dominate all forms of profession in Nigeria except petty trading. The mean age of the broadcasters was 46.3 ± 7.3 years while the modal ages were 46 and 55 (43.3%). A considerable proportion of the broadcasters (40.0%) fell within the age range

36 and 45 while 10.0% of the respondents fell within the range 56 and 65 and only 6.7% were in the 26 and 35 age bracket. This finding suggests the presence of a mature and vibrant group of personnel who have a lot to impact on the system in terms of experience. The breakdown also shows a gradual succession trend and corroborates the findings of Oladeji and Badiru (2007) that 98.9% of broadcasters fell within the age range of 26-45 years. The modal educational attainment was HND/BSc (40.0%) followed by masters degree (36.7%) and PGD (20.0%). Only 3.3% had SSCE as the highest educational attainment. This means that most (96.7%) of the respondents had a minimum of Higher National Diploma as their qualification. This finding is in contrast with that of Talabi and Ogundeji (2012) who found that 80% of the practising journalists of *The Hope* newspapers, Nigeria had less than Higher National Diploma. The disparity may be due to the fact that this study is specific to rural development broadcasters while Talabi and Ogundeji focused on a newspaper. High educational attainment is however expected due to the presence of a high number of institutions of higher learning in the southwestern zone. This high educational attainment if properly channeled could be a great potential for turning the sector around. The modal academic background was mass communication (70%) while a handful (23.3%) had a background in agriculture. This dominance of the sector by others than agriculturists may imply that there is still a gap to be filled by trained agricultural communicators in the field. This is not surprising since Oladeji and Badiru (2007) had earlier found out that there is an under-representation of agriculturists in the broadcasting industry of Southwestern Nigeria.

Meanwhile, Table 1b shows that many of the listeners (69.6%) were male which may suggest that the rural areas are male dominated. This agrees with the official population figure which revealed that there are more male than female in the country (Federal Republic of Nigeria Gazette, 2007).The mean age of the listeners was 43.9 ± 11.6 years. Majority of them was in the productive age of 31 and 60 years (81.5%), 10.5% fell within 1 and 30 years, while 8.0% were above the age of 60 years. This finding is in line with that of Salimonu(2007) and Yekinni(2010) who reported 43.2 and 48.1 as mean ages of farmers respectively in earlier studies conducted in the country. This implies that the study area has a potential agricultural workforce that can contribute meaningfully to the agricultural and rural development of the country.

Majority of the listeners (92.2%) had formal education, while only a few (7.8%) had no formal education. This suggests a high literacy rate and is in agreement with the report of the Nigerian Educational Data Survey (2010), which puts the literacy rate in the southwest and southeast geopolitical zones at 74%. This implies that majority of the listeners would be able to read and write and as a result, might be well disposed to read information to reinforce their adoption of new agricultural technologies that may be disseminated through rural development broadcasts.

Similarly, many of the listeners (65.8%) were primarily engaged in farming. This corroborates the assertion of Windapo and Afolayan (2005)and confirms the general belief that agriculture provides employment for majority of the rural populace. This implies a high potential for the listenership of rural development broadcasts in the study area. This is expected to translate to a high potential customer base for the sponsors of rural development broadcasts.

Table 1a
Distribution of rural development broadcasters by their personal characteristics

Variable	Category	Frequency	Percent	
Sex	Male	21	70	
	Female	9	30	
Age	26 – 35	2	6.7	Mean 46.3
	36 – 45	12	40	Mode 46 - 55
	46 – 55	13	43.3	S.D 7.3
	56 – 65	3	10	
Highest educational attainment	Secondary school	1	3.3	
	Higher National Diploma/ First degree	12	40	
	Postgraduate diploma	6	20	
	Masters' degree	11	36.7	
Academic discipline	Agriculture	7	23.3	
	Mass communication	21	70	
	Social sciences	2	6.7	

Table 1b
Distribution of rural listeners by their personal characteristics

Variable	Category	Frequency	Percentage	
Sex	Male	305	69.6	
	Female	133	30.4	
Age	1-30	46	10.5	Mean = 43.9
	31-60	356	81.5	Mode = 79
	61-79	36	8.0	SD = 11.6
Highest educational attainment	No formal education	34	7.8	
	Primary	125	28.5	
	Secondary	167	38.1	
	ND	40	9.1	
	NCE	38	8.7	
	HND	15	3.4	
	BSc	15	3.4	
	MSc	4	9	
Major occupation	Farming	288	65.8	
	Trading	94	21.5	
	Craftsmanship	14	3.2	
	Civil Servant	31	7.1	
	Others (clergy, transporters etc.)	11	2.5	
	Total	**438**	**100**	

Broadcast orientation

Table 2 shows that many (66.7%) of the available broadcasts had core agricultural orientation, while 26.6% had rural development orientation and few (6.7%) had agricultural marketing orientation. This does not come as a surprise since agriculture remains the main source of employment for the rural people (De Gennaro and Fantini, 2013). This therefore portends a high potential for the development of the sector as their occupational information needs are more likely to be met, thus enhancing the contribution of the rural sector to the overall economy.

Table 2
Distribution of agricultural broadcasts' orientation

Broadcasts' orientation	Frequency	Percent
Agriculture	20	66.7
Rural development	8	26.6
Agricultural marketing	2	6.7
Total	30	100

Commonly used programme formats

Table 3 shows that the rural development broadcast formats employed by the broadcasters were in seven categories; Lecture, News, Interviews, combination of lecture and interview, combination of news and interview, combination of lecture, news and interview and combination of interview and group discussion. A considerable number of the respondents (broadcasters) (30.0%) used the lecture format, interview format (20%) and news format (16.7%) while few (16.7%) also combined the interview and lecture formats. The breakdown of other categories was; News and interview (6.7%), Lecture, news and interview (3.3%) while interview and group discussion (3.3%). The result revealed the limited use of available programme formats among the rural development broadcasters considering the available programme formats listed by Ojebode, (2003) and Information and Communication for Development ICD (2004). This limited use of programme formats may have an implication on the listenership of rural development broadcasts in the study area as potential listeners are somehow restricted in their choice.

Table 3
Distribution of programme formats used by agricultural broadcasters

Category	Frequency	Percent
Lecture	9	30
News	5	16.7
Interviews	6	20
Lecture and interview	5	16.7
News and interview	3	10
Lecture, news and interview	1	3.3
Interview and group discussion	1	3.3
Total	30	100

Programme formats preference

Table 4 reveals that the lecture format was the most preferred format (95 points) among the agricultural broadcasters followed by the interview format (77 points) and news format (75 points) while group discussion format was the least preferred (43 points). The result was somehow different from the findings of National Association of Farm Broadcasting (2011) which found the news talk format to be the most common format for an AM farm broadcast station in the United States of America. The difference may be due to different prevailing environments in the two countries. Meanwhile, the preference of the rural listeners was slightly different from that of the

rural development broadcasters. The interview format was ranked as the most preferred format (1073 points) followed by the lecture format (927 points) and news format (911 points) in that order while group discussion format was the least preferred format (827 points). This implies that the use of the interview format by rural development broadcasters is more likely to attract more listeners than the other formats. Meanwhile, a mix of the trio of interview, lecture and news format may provide a good result in terms of stimulating wider listenership.

Table 4
Distribution of most preferred rural development programme formats by broadcasters and rural listeners

Programme format	Broadcasters		Listeners	
	Score	Rank	Score	Rank
Lecture	95	1st	927	2nd
Interviews	77	2nd	1073	1st
News	75	3rd	911	3rd
Group discussion	43	4th	872	4th

Test of difference between the most preferred programme formats of rural listeners and broadcasters.

Table 5a shows that there was a significant difference between rural listeners and broadcasters in their preferences of lecture ($t = -3.007$, $p < 0.05$) and group discussion ($t = 5.006$, $p < 0.05$) in the packaging of the broadcasts whereas there was no significant difference between rural listeners and broadcasters in their preferences of the use of interview ($t = -0.889$, $p > 0.05$) and news ($t = 0.527$, $p > 0.05$) formats in the packaging of rural development broadcasts.Table 5b however, shows that the difference was more skewed to the broadcasters than the listeners in the case of the lecture format as against group discussion format which was more skewed to the listeners.The fact the there was no significant difference in rural development broadcasters and listeners' preferences of the interview format in the light of Table 4 implies that there is agreement in preference forinterview format among both the rural development broadcasters and listeners, thus making the format more suitable and appropriate for rural development information dissemination. This is further reinforced by the fact thatinterview format was the most preferred format among the listeners who are the main focus of the message and their preference should therefore be given priority.

Table 5a
Distribution of the of test of difference between rural listeners' and rural broadcasters' most preferred programme formats

Choices	T	Df	p-value
Lecture	-3.007	31.351	0.005
Interview	-0.889	31.825	0.381
News	0.527	33.449	0.601
Group discussion	5.006	43.977	0.000

Level of significance = 0.05

Table 5b
Group statistics

Choices	Categories	Mean
Lecture	Listeners	0.1826
	Broadcasters	0.4667
Interview	Listeners	0.1324
	Broadcasters	0.2000
News	Listeners	0.2763
	Broadcasters	0.2333
Group discussion	Listeners	0.3242
	Broadcasters	0.0667

CONCLUSION AND RECOMMENDATIONS

The study revealed that rural development broadcasters in the study area make use of few types of programme formats out of the many formats available for rural development broadcasting. Among the used formats,interview format was found to be the most preferred format among the listeners. Its preference was also found to be high among the rural development broadcasters. It is therefore recommended that the interview format should continue to be used in order tosustain listenership of rural development broadcasts.

REFERENCES

De Gennaro, B and Fantini, A (2013)The concept of rurality and the rural-urban relationship as perceived by young people retrieved on 21st January, 2013 from http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2002/2002_WS03_01_Degennaro.pdf

Federal Republic of Nigeria Gazette (2007) *Federal Republic of Nigeria Gazette*, Federal government printers, Lagos. 94.4

Information and Communication for Development ICD (2004)Radio broadcasting for health: a decision maker's guide. Issues paper published by department for international development (DFID), July 2004, 50 pages.

Kumar, S (2012)Gandhian concept of development journalism and its relevance in post independence India.*Asian journal of multidimensional research*.1.7. Retrieved on 22nd January, 2013 from http://www.tarj.in/images/download/ajmr/AJMR%20DEC.%202012%20PAPERS%20PDF/12.11,%20Subhash%20Kumar.pdf

Lawanson, O.I (2008) Female labour force participation in Nigeria: determinants and trends. A paper presented at Oxford business and economic programme. Retrieved on 24th January, 2013 from *www.gcbe.us/2008_OBEC/data/Olukemi%20I.%20Lawanson.doc*

National Association of Farm Broadcasting (2011)*Harvesting the power of farm broadcasting*. Retrieved from http://www.depts.ttu.edu/aged/nafb_website/links/book.pdf

Nigerian Educational Data Survey (2010) Nigerian DHS edData survey; education data for decision making retrieved from http://nigeria.usaid.gov/sites/default/files/NEDS%20FINAL_Report_5-23-2011.pdf

Ojebode, A. (2002) Radio utilisation of indigenous programmes for development in Oyo state. Thesis. Communication and language arts. Arts, University of Ibadan, Nigeria

Ojebode, A. (2003)Radio as a development communication medium; types, formats, roles and limitation in E. O. Soola (ed) *Communicating for development purposes*, Ibadan Kraft's Books Ltd pp 87 – 97.

Oladeji, J.O. and Badiru, I. O. (2007) Employment prospects of agricultural extension and rural development graduates in the broadcasting industry of Southwestern, Nigeria. *Research Journal of Applied Sciences* 2. 3: 319 – 322 retrieved on 11th June 2007 from www.medwelljournals.com/new/5detail.php

Salimonu, K. K. (2007) Attitude to risk in resource allocation among food crop farmers in Osun State, Nigeria. Diss. Agricultural Economics. Agriculture, University of Ibadan.

Sitawa Ogutu, J. K, Ngunjiri, L. and Chege, S. W. (2012) The potential of radio broadcasting as a medium for disseminating agricultural information and technologies retrieved on 18thOctober, 2012 from www.kari.org.

Talabi, F.O and Ogundeji, B.K. (2012)Effects of non-professionalism in Nigeria journalism. Journal of Mass Communication and Journalism 2:117. doi:10.4172/2165-7912.1000117

Windapo, O. and Afolayan, S. O. (2005) Group dynamics and leadership in agricultural extension. *Agricultural Extension in Nigeria*. S. F. Adedoyin (ed) Agricultural Extension Society of Nigeria, Ilorin, Nigeria pp 134 – 138.

Yahaya, M.K. (2003) D*evelopment communication; lessons from change and social engineering projects.* Ibadan. Corporate graphics Ltd, 240 pages.

Yekinni, O.T. (2010) Determinants of utilisation of information and communication technologies for agricultural extension delivery in Nigeria. Diss. Agricultural Extension \and Rural Development, Agriculture and Forestry. University of Ibadan.

Vegetable Farmers' Perception of Adoption of Organic Farming in Oyo State, Nigeria

Oladeji J. O., Ajadi, S.O., Oyesola, O. B. and Sangotegbe N.S.
Department of Agricultural Extension and Rural Development
University of Ibadan, Ibadan
loisdaddy@yahoo.com [2]siji004u@yahoo.com

ABSTRACT

The study was designed to investigate vegetable farmers' perception of organic farming in Oyo state, Nigeria. Multistage sampling procedure was used to select 134 vegetable farmers in the state. Quantitative data were collected using structured interview schedule, and analysed using descriptive and inferential statistical tools. Result shows that vegetable farmers in the area are mostly male (63.4%), married (84.4%), with mean age of 41.2 ± 9 years. All (100.0%) of the respondents were aware of organic farming practices. However, majority had unfavourable perception of organic agricultural practices. This is in spite of the high level of benefits derived from organic farming practices among majority (66.4%). Major constraints to the practice of organic farming included health hazards associated with handling organic manure ($\bar{x}$ = 2.27), lack of institutional supports ($\bar{x}$ = 2.27) and inadequacy of land availability ($\bar{x}$ =2.27). There were significant relationships between respondents' sex (χ^2=7.490, p = 0.006); educational level (χ^2=36.498, p = 0.000), age (r = 0.260, P=0.002); farm size (r = 176, P=0.042), constraints to organic farming (r = -0.208, P=0.016) and their perception of organic farming. There is therefore the need to give incentives as well as provide adequate institutional supports to farmers so as to encourage organic vegetable production among farmers in Oyo State.

Keywords: Organic farming, Vegetable farmers' perception, Awareness, Constraints.

INTRODUCTION

Organic farming is gaining popularity today, as it can diversify agricultural production system toward attaining improved productivity and farm income. Food safety is seen as a sustainable alternative to chemical-based agricultural systems (Biao, Wang, Ding and Yang,2003). International Federation of Organic Agricultural Movements (2000) defined 'organic agriculture as a process that develops a viable and sustainable agro ecosystem". Organic farming produces safe and nutritious food as it helps prevent soil pollution by stopping risky chemical reactions in the soil and avoiding produce contamination, as well as soil erosion. Biological research on soil and soil organisms has proven beneficial to organic farming. Varieties of bacteria and fungi break down chemicals, plant matter and animal waste into productive soil nutrients. In turn, they produce benefits of healthier yields and more productive soil for future crops (Gillman, 2008). Long term benefits of organic farming include the preservation and enhancement of soil, increasing the likelihood that it will continue to produce quality food for future generations. Organic farming encourages healthy populations of beneficial insects that keep destructive insects under control. It also helps preserve aquatic life and clean water by minimizing the flow of toxic pesticides into streams, rivers, and lakes especially in vegetable farms under irrigation system. Organic farming offers a unique combination of environmentally-sound practices with low external inputs while contributing to food availability (Zundel and Kilcher, 2007).

Vegetable constitute an important component in a man's diet, especially in developing country like Nigeria. It is an edible crop and usually a succulent crop plant part which could be eaten with staples as main course or as supplement food in cooked or raw form(Okobia, 2010). However, vegetable production is now a very profitable business, Examples of such vegetables commonly cultivated include, *Amaranthuks cruetus, Celosia argentea, Telfera occidendatalis* . Organic farming produces vegetables safe from pesticides, fertilizer residues and perforated leaves caused by infestation from pest. Suitable areas like river banks and swampy urban areas are now used for cultivating vegetables and this had gone a long way complimenting rural farming in supplies of fresh vegetables in most cities. However, pest infestation has been a problem of vegetable planting which reduces availability, market and nutritional values of vegetable produced. Attempt to increase vegetable production has increased the use of fertilizer and pesticide which leads to biodegradation of the

environment, with increasing potential harms to human health. Perhaps, this has led to a growing demand for organic vegetables among other products, and farmers all over the world are shifting their production practices to meet this challenge. Corroborating this, Hadriman (2004) found out that the nutritional value was an important factor that influences consumers' preferences in purchasing chemical free vegetable, followed by desire, freshness, health effect and taste. The importance of organic farming is thus being realised by farmers as well as the policy makers, intellectuals and sensitive citizens after observing the deteriorating situation in the agriculture sector.

In Oyo State, Nigeria however, organic agriculture appears to have existed by default among majority of vegetable farmers perhaps due to scarcity and high cost of chemical fertilizer which makes it an inaccessible input for farmers. This therefore suggests that farmers can still make use of these chemicals if available in the market. On the other side, the fact that there is near organic practice in vegetable farming by farmers suggests favourable perception or otherwise towards organic vegetable production. Neupane, Sharma and Thapa (2002) and Rogers (2003) posited that farmers' perception determines adoption of improved technology. Farmers' views therefore go a long way in influencing their decision to either accept or reject any innovation. It is in the light of the foregoing that the study provided answers to the following research questions:

1. Are the farmers aware of organic vegetable farming?
2. What are the benefits of practicing organic farming?
3. What are the constraints to organic farming faced by vegetable farmers in the study area?
4. Are vegetable farmers' perceptions of organic farming in Oyo state favourable?

METHODOLOGY

The study was carried out in Oyo State, Nigeria. Oyo State was created in February 1976 and covers a total of 27249 square kilometres of land mass. Agriculture is the main occupation of the people of Oyo State, as the climate favours the cultivation of vegetable and other important arable crops.

Multistage sampling procedure was used to select the vegetable farmers. The state was stratified into the three senatorial districts of Oyo North, Oyo Central and Oyo South. One Local Government Area (LGA) each from the three senatorial districts of the state was randomly selected. These are Saki West, Oyo West and Ido LGAs respectively. A list of vegetable farmer was generated by snowball technique and 65% of the generated list was randomly selected in each of the selected LGAs to give a total of 134 respondents.

Measurement of variables

Benefit of organic farming

Respondents were asked to respond to a list of benefit items, using a 2-scale of yes and no. Responses in favour of a statement (yes) was scored 1, while 'no'was scored 0. Respondents' level of benefits was categorised into high and low, using the mean benefit score as the benchmark.

Constraints to organic vegetable farming practices

Respondents were asked to indicate whether the possible constraints to organic farming were very severe, severe, less severe, and not severe, with scores of 4, 3, 2, and 1 assigned respectively.. The weighted mean score for each of the constraints was computed and used to rank them on the basis of importance.

Perception of organic farming

Respondents were asked to respond to a set of 26 perception statements using a 5-point Likert-type scale to provide answers to a list of statements measuring perception of organic agriculture. Respondents' perception was either favourable (scores ≥ mean) or unfavourable (scores < mean), as the overall mean perception score was used as the benchmark.

RESULTS AND DISCUSSION

Personal characteristics of vegetable farmers

The result in table 1 indicates that the mean age was 41.2 ± 9, as majority (83.5%) belonged to age range of 21-50 years. This implies that majority of the respondents are within the middle age group and they are expected to be very active and productive in vegetable production. This contradicts Fasoranti (2010) who stated that excessive drain of youth from rural populace had left only the older and aged members to constitute the labour forces of the rural area.The result in Table 1 also shows that 63.4% of the farmers were male, implying that men are more involved in vegetable farming in Oyo State.. This could be due to tedious nature of the activities involved in vegetable production.Table 1 further shows that 50.8% of the farmers had formal education ranging from primary education to higher institution, while 35.1% had no formal education and the remaining 14.2% had adult education. Table 1 further reveals that strong family ties exist across the state as majority (84.3%) were married. A study carried out by Ofuoku, Egho and Enujeke (2009) also showed that married individuals are more involved in Agriculture. Results further show the year of experience in vegetable cropping in the study area as 7.7 ± 3 years. This result shows that farmers in the study area have appreciable level of experience which is a good position to exhibit independent

disposition towards perception of any new concept in vegetable cropping. Also, 60.4% and 28.4% of respondents had household size of 4-6 and more than 6 members respectively. This suggests that majority of the households in the study area make use of family members to prosecute their agricultural practices in the study area.. The result further reveals that all the respondents grew the following vegetables; *Amaranthushybridus* (Tete) (67.2%), *Corchorusolitorious* (Ewedu) (60.4%), *Telferaoccidentalis* (Ugwu) (20.9%), *Celociaargetea* (Shoko) (47.8%), *Solanummacrocarpon* (Gbagba) (37.3%). The result implies that cross-cultural vegetable varieties were hardly grown, perhaps due to lack of market.

Table 1
Frequency Distribution of respondents' personal characteristics

Variables	Frequency	Percent
Age range (Mean = 41.2 ± 9) yrs	1	0 .7
20 and below	18	13.4
21-30	44	32.8
31-40	50	37.3
41-50	17	12.7
51-60	4	3.0
Above 60		
Sex		
Male	85	63.4
Female	49	36.6
Educational level		
No formal education	47	35.1
Adult literacy	19	14.2
Primary education	19	14.2
Secondary Education	8	6.0
Technical or grade II	18	13.4
College and Higher Institution	23	17.2
Marital status		
Single	11	8.2
Married	113	84.4
Widowed	8	6.0
Divorced or Separated	2	1.5
Household size		
1-3 Members	15	11.2
4-6 Members	81	60.4
Above 6 Members	38	28.4
Types of vegetable grown		
Tete (*Amaranthus hybridus*)	90	67.2
Ewedu *(Corchorus olitorious)*	81	60.4
Ugwu *(Telfera occidentalis)*	28	20.9
Shoko *(Celocia argetea)*	64	47.8
Gbagba *(Solanum macrocarpon)*	50	37.3
Farming experience (mean=7.2±3)		
1-5 years	43	32
6-10 years	62	46.4
11-15 years	26	19.4
Above 15	3	2.2

Perceived benefit of organic farming

The result of the analysis on Table 2shows distribution of the benefits of organic vegetable farming as perceived by farmers in Oyo State. The results reveal that majority of the respondents agreed that organic farming maintains soil moisture content (73.1%). These benefits of which farmers are aware have been attributed to organic agricultural practice.. IFOAM (2000) posited that the environmental benefits of organic farming methods are far clearer as it enhances soil structures, conserves water, mitigates climate change, and ensures sustained biodiversity. The farmers were also aware of the fact that Organic farming control pests and diseases without harming the environment (71.6%) and that organic method produces crops free from chemical residues (68.7%). This also reveals that respondents were aware of the environmental effects of inorganic chemicals in the process of getting rid of pests and diseases for improved productivity. While emphasizing the environmental friendly nature of organic agricultural practices, Gosling, Hodge, Goodlass, and Bending, (2006) highlighted that by not using soluble chemical fertilizers and limiting the use of natural biocides in organic farming, organic farming is largely dependent on biological processes for the supply of nutrients and for protection of crops from pests and disease.

Respondents also were aware that organic farming does not inject toxic waste into water bodies (67.9%), organic farming encourages healthy population of beneficial insect and micro-organism (66.4%) and that organic farming use resources which the farmers already have (63.4%) and that organic method does not lead to development of resistant varieties (53.0%). This implies that farmers were aware of the closeness of their traditional farming practices to the organic farming practices. They also accepted that organic farming is beneficial to them as individuals and to the environment.

The summary of the levels of perceived benefits is shown in Table 3: The result shows that 33.6% of the respondents had scores below the mean benefit score of 6.02, and were hence categorised as low level of benefits, while 66.4% of the respondents had score above the mean 6.02 and they are classified as high benefit. An understanding of the benefit associated with organic farming could influence a favourable perception of organic farming practices.

Table 2
Frequency distribution of respondents' perceived benefit of organic farming

Statements	F	%
Control of pests and diseases without harming the environment	96	71.6
Increasing long-term soil fertility	55	41.0
Nutritious food, feed for animals and high quality crops to sell at a good price.	65	48.5
Use resources which the farmers already have	85	63.4
Maintains soil moisture content	98	73.1
Encourages healthy population of beneficial insect and micro organism	89	66.4
Produces crops free from chemical residues	92	68.7
No injection of toxic waste into water bodies	91	67.9
Does not lead to development of resistant varieties.	71	53.0
Reduces leaching and erosion	66	49.3

Table 3
Frequency distribution of respondents' level of benefits

Level of Benefit	Score range	F	%	SD	Mean Score
Low	1-5	45	33.6	2.12	6.02
High	6-10	89	66.4		

Constraints faced by respondents in practicing organic farming

Result of the analysis on Table 4 reveals respondents' frequency distribution and ranks of constraint based on the level of severity. The result shows the following constraints as most severe, Nigerian institutes of agriculture have not effectively champion organic practices (2.27); organic Health hazard is associated with handling manure (2.27) and inadequate support from governmental and non-governmental agencies (2.26). They also indicated that large land requirement for organic farming is a constraint (2.23) These results implies that constraints to practicing organic agriculture are of different dimensions, covering institutional, economic, behavioural and health concerns.

Table 4
Frequency distribution of respondents' perceived constraints to organic farming

Constraints	Mean	Rank
High cost incurred in organic farming practices	1.79	13
Organic manure is too bulky to transport	1.91	14
Poor pricing of organic product.	2.00	9
Insufficient knowledge on organic farming practices	1.88	16
Inadequate information on the nutritional benefits of organic product	1.98	10
Inadequate understanding of organic concepts	1.97	11
Organic farming requires much land for its practices	2.23	4
Need for increased food production necessitate the use of agrochemicals	2.19	6
Inadequate support from governmental and non-governmental agencies	2.26	3
Organic practices require technical services which are not available	1.91	14
Nigerian institutes of agric have not effectively championed organic practices	2.27	1
Vegetable farmers are not aware of residual effect of inorganic fertilizer on vegetable.	1.92	12
Health hazard is associated with handling organic manure	2.27	1
Inadequate trained manpower	2.17	7
Research neglect	2.20	5
Inadequate government support on organic practices	2.17	7

Respondents' perception of organic farming

The summary of the respondents on their perception of organic farming is as shown on Table 5. The grand mean of the total respondent was 2.96, therefore statements with mean score below 2.96 were considered not favourable about the initiative while statements with mean score of 2.96 and above were considered favourable. Respondents have favourable perception of the following statement in respect of organic farming; Organic farming produces better yield in crop production (mean = 3.12), organic fertilizer of plant origin improves crop performance better (mean =3.16), organic vegetables are tastier compared with inorganic ones (mean=3.11), as well as organic vegetables are more expensive (mean = 3.01). Respondents also perceived that most farmers mix organic fertilizer with inorganic fertilizer(mean=4.26), Weeds and remains of harvested crops should be allowed to decay(mean=3.43). However, results further reveals that majority of the respondents do not show favourable perception with respect to other statements (Table 6), as their mean values fall below 2.96, suggesting farmers' lack of information of these components of organic agriculture This could also be as a result of serious constraints faced by the small scale farmers to the practice of organic vegetable farming in the study area.

Respondents' level of perception of organic farming is shown on Table 6. The perception index was categorized based on respondents' score. Respondents with score below mean (74.04) were categorized as having unfavourable perception while respondents with score above mean value (74.04) were categorized as having favourable perception. Hence, 44% of the respondents had favourable perception of organic agricultural practice, while 56% had unfavourable perception. This implies that majority of vegetable farmers do not prefer organic farming to conventional farming despite its benefit. This negates the findings of Dipeolu *et al*. (2006) that farmers, in general, had a positive perception of organic production.

Table 5
Frequency distribution of respondents' perception of organic farming (N = 134)

Statements	Mean	SD
Organic farming produces better yield in crop production.	3.12	1.48
Most farmers are not aware of the use of biological agent.	2.81	1.33
Herbicide and fertilizers reduces labour cost.	2.20	1.35
Organic method encourages the influx of pest and diseases.	2.54	1.42
Most farmers improve the fertility of their soil through only organic fertilizer.	2.86	1.50
lack knowledge on other methods of weed control	2.89	1.47
Organic manure harbours pathogens	2.85	1.40
Organic fertilizer of plant origin improves crop performance better.	3.48	1.39
Organic fertilizer is not readily available	2.95	1.41
Organic products are not expected to be cheaper as compared to inorganic.	2.84	1.51
Crop rotations is commonly used as a strategy for disease and insect pest management	3.16	1.53
Organic vegetables are tastier compared with inorganic ones.	3.11	1.54
Organic vegetables are more expensive	3.01	1.51
Organic farming is common among vegetable farmers.	3.73	1.23
Most farmers mix organic fertilizer with inorganic fertilizer	4.26	1.00
Weeds and remains of harvested crops should be allowed to decay.	3.43	1.36
There is positive effect on the quality of crop produced resulting from the use of organic fertilizer.	2.94	1.56
Organic vegetables are not attractive	2.98	1.52
Organic methods bring about pest and disease incidences due to use of plant and animal remains	2.38	1.36
Organic vegetables have no harmful effect	3.00	1.43
Insufficient training for farmers on preparation of organic manure.	2.65	1.45
Many farmers are not aware of the residual effect of inorganic fertilizer	2.34	1.34
The use of organic fertilizer is labour intensive	2.20	1.26
0rganic vegetable are superior in quality to inorganic ones	2.97	1.49
Organic vegetable are more healthier to consume	3.23	1.5

Table 6
Frequency distribution of respondents' level of perception of organic farming

Level of perception	Score range	F	%	Grand Mean	SD
Favourable	74-96	59	44.0	74.0	12.59
Unfavourable	50-73	75	56.0		

Relationship between selected personal characteristics of respondents, constraints to organic farming practices and perception

Table 7 reveals that there were significant relationships between farmers' sex (χ^2=7.490, p = 0.006), educational level (χ^2=36.498, p = 0.000), primary occupation (χ^2 =36.878, p =0.000) and their perception of organic farmingThe position of FAO (2010) that male are often given greater priorities than female in terms of their access to credit facilities, land tenure system and training of farmers could better position male farmers in terms of disposition to organic agricultural practices. It also partially agrees with Clay, Reardon and Kangasniemi (1998) also reports a significant relationship between education and adoption decisions. It however disagrees with Ayanwuyi *et al*. (2010), which establishes no significant relationship between education and adoption of agricultural technology.

Table 7
Chi square Analysis of Respondents' personal characteristics their perception of organic farming

Variable	χ^2-value	Df
Sex	7.490*	1
Educational level	36.498*	5
Marital status	3.446	3
Primary Occupation	36.878*	13
Cropping pattern	0.446	1

* P ≤ 0.05

Table 8 shows that there were significant relationship between respondents' age (r = 0.260, P = 0.002), farm size (r =176, P = 0.042) and their perception of organic farming. This means that older people have favourable disposition towards organic agricultural practices for vegetable production. This may be due to the fact that the

traditional system of farming to which the older farmers are used requires minimal use of systemic substances. The favourable disposition of the farmers with larger farm size could be as a result of the available land and possibly resources which gives them an edge over others, in terms of practicing organic vegetable farming in the state. The result also reveals that there is a significant relationship between constraints to organic farming faced by the respondents and their perception of organic farming. (r = - 0.208, p = 0.016).This implies that constraints to organic farming go a long way in diffusing the minds of farmers towards organic agricultural practices.. Corroborating this, Helme,(2010) asserted that understanding the barriers to development is an important first step in promoting stronger opportunity for career decision making.

Table 8
PPMC Analysis of age, household size, farm size, farm experience, constraints to organic farming and respondents' perception of organic farming

Variable	N	r- value
Age	134	0.260*
Household size	134	-0.011
Farm size	134	0.176*
Farming experience	134	-0.065
Constraint	134	- 0.208*

- P ≤ 0.05

CONCLUSION

From the findings of this study, it can be concluded that the vegetable farmers in Oyo State were mostly male, who enjoyed the supports of their household members in vegetable production. Vegetable farmers in Oyo State plant varieties of local vegetables. However, cross-cultural vegetable varieties are rarely planted. It can also be concluded that high level of awareness of organic agricultural practices of the respondents did not translate into favourable perception of its practices, in spite of high level of perceived benefits of organic vegetable production practices. It is therefore concluded that respondents were faced with different constraints in their attempts to practicing organic vegetable production, which significantly affected their overall perception. Based on the conclusion of the study, the following recommendations are made:

1. There is need for more commitment of various agencies involved to seriously sensitize farmers and channel the course of organic farming in order not to jeopardize long time sustainability of agriculture in the study area and the country at large.
2. There is need to create more awareness in respondents and organization of training programs on various potentials and prospects of organic farming, especially to sustained healthy living and environmental stability. This is expected to boost their perception, and will therefore make adoption of organic agricultural practices easier.
3. Considering high level of constraints faced by vegetable farmers, there is need for the government and other organic agriculture related organizations to give and/or mobilize incentives and supports to farmers in order to boost their interest in organic farming.

REFERENCES

Ayanwuyi E, Kuponiyi F. A, Ogunlade, Oyetoro J O (2010) Farmers perception of impact of climate changes on food crop production in Ogbomosho Agricultural Zone of Oyo State, Nigeria. *Global Journal of Social Sciences* Vol. 10: 33

Biao, X., X. Wang, Z. Ding and Y. Yang. (2003) Critical impact assessment of organic agriculture. *Journal of Agricultural and Environmental Ethics*

Clay D, Reardon T, Kangasniemi J. (1998) Sustainable intensification in the highland tropics: Rwandan farmers' investments in land conservation and soil fertility. *Economic Development Cultural Change* Vol. 46(2): 351–378.

Dipeolu, A. O.; K. A. Bello and S. O. Akinbode (2006) Comparative economic analysis of organic and inorganic vegetable production in Ogun State, Nigeria. *Proceedings of the 2nd National Conference on Organic Agriculture, University of Ibadan, Ibadan, Nigeria* 27 – 29 November, 2006. pp. 24.

Food and Agricultural Organisation (FAO) (2010) FAO gender and land rights database. Available at: http://www.fao.org/gender

Fasoranti O. O. (2010) Perception of rural migrant in selected rural communities in Ondo state. Department of Sociology, Adekunle Ajasin University, Akungba Akoko Nigeria.

Gillman J. 2008: 'The truth about organic gardening: *Benefits, Drawbacks, and the Bottom Line'*. Timber Press.

Gosling, P., Hodge, A., Goodlass, G. and Bending, G.D. (2006) Arbuscular mycorrhizal fungi and organic farming. *Agriculture, Ecosystems and Environment* Vol.113: 17-35.

Hadriman, K. (2004) Consumers' perceptions, attitudes and willingness to pay towards chemical free vegetable in North Sumatera. M.Sc thesis, University Putra Malaysia

Helme, S. (2010) Career decision-making: what matters to indigenous Australians? *Australian Journal of Career Development.* Vol. 19: 3.

Igodan,C.O. Ohaji, P.E and Ekpere, J. A. (1997) " Factors associated with the adoption of recommended practice for maize production in the Kanji Lake Basin of Nigeria, "*Agricultural Administration and Extension* Vol. 29: 1-8.

International Federation of Organic Agriculture Movements (IFOAM) (2000) *IFOAM Basic Standards*. International Federation of Organic Movements, Tholey-Theley, Germany

Neupane, R. P., Sharma, K., R. & Thapa, G. B. (2002) Adoption of agroforestry in the hills of Nepal: A logistic regression analysis. *Journal of Agricultural Systems* Vol. 72:177-196.

Ofuoku, A.U,Egho,E.O and Enujeke, E.C. (2009) Integrated Pest Management (IPM) adoption among farmers in Central Agro-Ecological Zone of Delta State, Nigeria. *Nigeria Advances in Biological Research* Vol. 3 1-2

Rogers, E. M. (2003) *Diffusion of Innovations* (Fourth Edition). New York: Free Press.

Zundel, C and Kilcher, L. (2007) Organic agriculture and food availability. *Proceeding of International Conference on Organic Agriculture and Food Security*. 3rd - 5th May 2007, FAO, Italy. Retrieved Jan. 26, 2011 from *ftp://ftp.fao.org/paia/organicag/ofs/ofs-2007-1.pdf*

Effect of Credit from Self Help Groups on Women Farmers' Farm Income in Isuikwuato Local Government Area of Abia State, Nigeria

***Anyiro C.O, Ajuka P.N and Udah S.C.**
Department of Agricultural Economics and Extension, Abia State University, Umuahia Campus, PMB 7010, Umuahia, Abia State, Nigeria.
Correspondence Author: anyirochidozie@gmail.com

ABSTRACT

The study examined the effect of credit from self help groups on women farmers' farm income in Isuikwuato Local Government Area of Abia State, Nigeria. Purposive and Multistage random sampling technique was employed in the sample selection of one hundred and twenty (120) women members of self help groups. The instrument of data collection was via a set of pre-tested structured questionnaire. The data were analyzed using descriptive statistics, paired t-test and OLS regression analysis. Findings revealed that the mean loan size accessed by the women farmers from self help groups was ₦99,325.00. The result of paired t-test for difference in the volume of credit accessed by women from self help groups and outside self help group showed that the mean (₦99,325) volume of farm credit accessed from women self help group was greater than the mean amount (₦60,033.33) obtained outside women self help groups. Also the result of the paired t-test for difference in the net farm incomes of the women farmers before and after accessing micro credit from women self help groups showed that the mean net farm income of women farmers before accessing micro credit from SHGs was ₦90, 741.67 while their mean income after accessing micro credit from SHGs was ₦111, 408.3. The mean difference between the two net farm incomes was ₦20, 666.67 with a standard error of 6570.01. The result of the multiple regression analysis showed that the volume of funds accessed from women self help groups was influenced by education, marital status, years of borrowing experience, farm size and annual contribution of the respondents. The R^2 and F-ratio values were 0.5294 and 15.47 respectively. It was however, recommended that the women should join high performing women self help groups that would give them opportunities of making reasonable savings in a year. This will encourage thriftiness in their individual farm businesses and reduce their dependence on loans from outside.

Keywords: Self help group, Women farmers, Micro financing, Farm credit

INTRODUCTION

Women constitute a formidable and significant live wire of peasant farming in Nigeria, providing between 70% and 80% of food produced and consumed in Nigeria (Food and Agricultural Organization 2004; Nwankwo, 2004; World Bank, 1996). In spite of this, they still face a lot of hardship that have forced them to remain perpetually small-scale producers. Rural women farmers in Nigeria had been described as small scale operators, tenants or landless, characterized by low income and high nutritional deficiency. Although women farmers contribute significantly to agricultural production in Nigeria, they are least likely to benefit from agricultural extension services, agricultural credit schemes and technologies that would improve their productivity. This has been as a result of barriers exerted by cultural, social, biological and religious factors (Nwaru, 2003; Ijere, 1991). In fact, there is a strong case for arguing that without credit, it is difficult to see how women smallholders could generate incomes that can sustain an adequate livelihood (Durno and Stuart 2005; Hoddinott, 1998). However, most women in rural areas take initiatives to improve their own standard of living. They do these by engaging most in self help group micro financing of farms.

A Self Help Group (SHG) is a village-based financial intermediary usually composed of 10-20 local women. Members make small regular saving contributions over a few months until there is enough capital in the group to begin lending to the members or to others in the village. They use the pooled resources to meet the credit needs of the group members. The groups are democratic in nature and collectively make decisions.

Self Help Groups (SHGs) play effective roles in promoting empowerment through giving of loans to members. They have helped in fighting poverty and have assisted in promoting microfinance in Nigeria. Self Help Groups (SHGs) are growing in number and are receiving increasing attention from the financial institutions, Non-Governmental Organizations (NGOs) and the governments as one sure way to transform lives for the poor.

A major constraint of farmers (especially women farmers) in Nigeria is how to obtain credit from formal financial institutions such as banks for farm operations. Unavailability of credit from financial organizations in Nigeria has resulted into the use of financial self – help groups to alleviate their sufferings in meeting financial needs. (Enabulele and Alufohai; 1999). Micro-finance is the supply of loans, savings and other basic financial services to the poor. These poor women farmers require diverse range of financial instruments to meet working capital requirement, build assets, stabilize consumption and shield themselves against risks. In practice, micro finance is more than disbursement, management and collection of small loans. It is a flexible process by which financial services are delivered to owners of micro-enterprises on sustainable basis. The objectives of this study therefore were to specifically;

i. describe socio -economic characteristics of women farmers involved in Self Help groups for farming in the study area.
ii. determine the amount of farm credit accessed by women beneficiaries from Self Help Groups
iii. compare the difference in the volume of credit accessed by women farmers from within and outside women self help groups in the study area.
iv. determine the impact of credit accessed from self help groups on women farm income in the study area.
v. determine the factors influencing the volume of credit accessed from women led self help group in the study area.

METHODOLOGY

The study was conducted in Isuikwuato Local government Area (LGA) of Abia state, Nigeria. The LGA was purposively chosen because it is one of the major food producing Areas in Abia state and majority of its farm labour force are women that participate actively in women self help groups. The LGA lies between longitudes 05^0 $32^/$ North of the equator and 07^0 $29^/$ East of the Greenwich Meridian. The Local Government Area is bounded in the North by Umunneochi Local Government Area in Abia State, in the South by Bende Local Government Area also in Abia State, in the West by Okigwe Local Government Area in Imo State and in the East by Ivo Local Government Area in Ebonyi State. It has a land area of 144.0 square kilometers with a population of 115,749 people. Of these, 56,660 (48.95%) are males while 59,134.621 (51.05%) are female (NPC, 2006).

Multi-stage and purposive random sampling technique was used in the selection of autonomous communities, villages, women self help groups and respondents. In the first stage, five out of sixty autonomous communities that made up the Local Government Area were randomly selected. The second stage involved the random selection of two villages from each of the chosen autonomous communities. This gave a total of 10 villages. From each of the chosen villages, a list of women led self help groups was obtained from the village secretaries who were the key custodian of village information. These formed the sampling frame for the women self help groups from which samples of two women led self help groups were randomly selected in each of the selected villages, thus giving a total of 20 women self help groups. The last stage of sampling involved the purposive selection of 6 women farmers in each of the selected women self help groups who had accessed farm credit from within and outside the women self help groups. This gave a total sample size of 120 women farmers. The instrument of data collection was via a set of pre-tested structured questionnaire. The data were analyzed using descriptive statistics, paired t-test and OLS regression analysis.

Paired treatment test (paired t" test) was used to compare the difference in the volume of credit accessed by women from self help groups and the volume of credit accessed from outside the women self help groups. Similarly, paired treatment test (paired 't' test) was also used to determine the difference in the net farm income of women farmers before and after accessing micro loans from Self Help Groups.

The Ordinary Least Square (OLS) multiple regression model is implicitly stated as:

$Y = f (X_1, X_2, X_3, X_4, X_5, X_6, X_7……..Xn, ei)$ ……(1)

Where:

Y = amount of credit accessed from women self help group (Naira)
X_1 = age (years)
X_2 = marital status (D=1 if Married, 0=Otherwise)
X_3 = educational level (Attainment of formal education; no formal education=0, primary education=1, secondary education=2, tertiary education=3)
X_4 = household size (number)
X_5 = annual contribution (Naira)
X_6 = farm size (hectare)
X_7 = interest rate (%)
X_8 = farm income (Naira)
X_9 = years of borrowing (years)
ei= error term

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

The socio-economic characteristics of women members of self help groups in the study area are shown in Table 1. The table shows that the mean

age of the women farmers was 40.79 years (40.79 ± 25.453). This is an indication that the women farmers in self help group in the study area were mostly middle aged that were within the active productive work force. Majority (91.7%) of the women were literate possessing diverse formal educational levels that ranged from primary school education to tertiary school education. Majority (78.3%) of the women members of self help groups were married with a mean household size of 4.3± 2.17 persons. The result also shows that the mean number of years of membership in women self help groups was 5.5±2.95 years. This indicates a moderate membership experience among the women in self help group micro financing of farms in the study area. The mean annual income and farm size of the women farmers were ₦100,741.7 (±73173.39) and 1.2 (± 0.67) hectares respectively.

Table 1
Socioeconomic characteristics of women farmers in women led self help groups in Isuikwuato L.G.A of Abia State Nigeria

Variables	Mean	Standard deviation
Age (years)	44.24	25.453
Household size (number)	4.25	2.167
Number of Years spent in local institution	5.5	2.95
Annual Income (₦)	100,741.7	73173.39
Farm size (hectare)	1.2	0.667
Marital Status	**Percentage**	
Single	21.67	
Married	78.33	
Education level	**Percentage**	
No formal education	8.33	
Primary education	28.33	
Secondary education	31.67	
Tertiary education	31.67	

Amount of credit accessed by women beneficiaries from self help groups

The distribution of the women farmers according to the amount of credit accessed from Self help groups for farming in Isuikwuato LGA of Abia state, Nigeria is presented in Table 2. The table shows that a good proportion of the women (57.50%) were given loan below ₦50,000. Also, a fairly good proportion of the women (21.67%) received between ₦50,000 and ₦100,000 while 7.5%, 8.33% and 2.5% accessed micro credit between ₦100,001- ₦150,000, ₦150,001- ₦ 200,000 and ₦200,001- ₦250,000 respectively. The mean loan size accessed by the women farmers from self help groups was ₦99,325.0 (±29,865). This indicates an appreciable amount of credit accessed by women from self group for farming. However, due to gross shortage of loanable funds, available funds were rationed among the numerous successful applicants.

Table 2
Distribution of women farmers according to the amount of credit accessed from Self help group for farming in Isuikwuato LGA of Abia State

Amount of credit received (₦)	Frequency	Percentages
≤ 50,000	69	57.50
50,000-100,000	26	21.67
100,001-150,000	9	7.50
150,001-200,000	10	8.33
200,001-250,000	3	2.50
250,001-300,000	3	2.50
Total	60	100.00
Mean	99,325	
Standard deviation	29,865	

Difference between volume of credit from SHGs and non SHGs sources

The result of the paired t-test for difference in the volume of credit accessed by women from self help group and that accessed from outside the women self help groups is shown in Table 3.The result shows that the mean farm credit accessed by the women from their self help groups was ₦99,325.0 while the mean farm credit accessed by the women from outside the women self help group was ₦60,033.33.The mean difference between the two farm credit was ₦39,291.67 ± 6570.01. The paired 't' result showed that this was statistically significant at 1.0% risk level. This implies that the mean volume of farm credit accessed from women self help group was greater than that obtained outside the women self help group. This could be attributed to the regular cash contributions/savings made by the women to their self help groups which are used for general running of the group and loaned as micro credit to members who signify interest in loan. This has implication in raising agricultural productivity and income of the women farmers.

Table 3
Result of paired t-test for difference in the volume of credit accessed by women from self help groups and that accessed from outside the women self help groups in Isuikwuato LGA of Abia State, Nigeria.

Variable	Individual mean	Mean difference	Standard Error	T-value
Credit accessed from women self help group (Naira)	99,325			
Credit accessed from outside women self help group (Naira)s	60,033.33	39,291.67	11264.2	3.4882

The effect of credit from SHGs on women farmers' farm income

The result of the paired t-test for difference in net farm income of women farmers before accessing micro loans from SHGs and their net farm income after accessing micro loans from SHGs is shown in Table 4. The result shows that the mean net farm incomes of women farmers before accessing micro loans from SHGs was ₦90,741.67 while the mean income after accessing micro loans from SHGs was ₦111,408.3.The mean difference between the two net farm income was ₦20,666.67 with a standard error of 6570.01. The paired 't' result showed that this was statistically significant at 1.0% risk level. This implies that the net farm income of women farmers after accessing micro loans from SHGs was greater than their net farm income before accessing micro loans from SHGs. This result compared favourably with Anyiro *et al* (2014) who obtained similar result among members of local institutions in Abia State.

Table 4
Result of paired t-test for difference in net farm income of women farmers before accessing micro loans from SHGs and their net farm income after accessing micro loans from SHGs in Isuikwuato LGA of Abia State, Nigeria.

Variable	Individual mean	Mean difference	Standard Error	T-value
Net Farm Income before accessing micro loans (Naira)	90741.67			
Net Farm Income after accessing micro loans (Naira)	111408.3	20666.67	6570.01	3.1456

Factors influencing the volume of credit accessed from SHGs

The result of multiple regression estimates of the factors influencing the volume of credit accessed from women self help groups in Isuikwuato LGA of Abia state are presented in Table 5. The result shows that the coefficient of multiple determination (R^2) was 0.5294 implying that the independent variables jointly explained 52.9% of variation in the dependent variable. The intensity of the explanatory power of the model was confirmed by the significance of the F-ratio of 15.47 at 1.0% level of probability.

Among the test variables, the coefficient (42021.95) of education was statistically significant at 5.0% risk level and had a positive coefficient. With this positive coefficient, it indicates that increase in education attainment of the women farmers increased the volume of credit accessed from women self help group. . A high literacy level is an advantage in the procurement of micro credit. This may be because women farmers that had formal education have better loan management tendency and also better tendency towards adopting new technology to enhance their productive activities. As expected, higher education would enhance improved technology adoption hence increased farm income and greater ability to repay (Njoku and Odii 1991; Ezeh *et al*, 2012).

The coefficient (14155.6) of years of borrowing had positive relationship with the volume of fund accessed from the women self help group in the study area and was statistically significant. This implies that women's credit history increases the amount of credit accessed in women self help group. This agrees with *a priori* expectations and much in tandem with Nwaru (2004) and Essein (2009) that the number of years an individual has been involved in borrowing may give an indication of the practical knowledge he has gained on how to overcome the problems associated with borrowing at minimal costs. Also the consistency in borrowing and relationship developed over years with lenders would critically sort them for credit worthiness, honesty and genuineness. Nwaru(2011) observed that this would lead to reduction in loan delinquency and default, hence, increase in the amount of loan repayment.

The coefficient (167782.5) of marital status was positive and significant at 5.0% probability level. The positive sign of this coefficient implies that the volume of credit accessed from women self help group increases among the married women. This is in line with *a priori* expectations. Informal credit suppliers will usually disburse credit depending on the marital status of the farmer. It is likely that the married respondents were more relatively stable, making their group to view them as more reliable, credit worthy, hence more likely to receive micro credit compared to the unmarried.

In line with *priori* expectation, the value of annual cash contribution of women to Self help group had a positive coefficient (5.335807) and was statistically significant at 5.0% alpha level. This implies that an increase in total annual cash contribution of the women results to an increases in the volume of fund accessed from women self help group. Women's' annual cash contributions made to self help group is presumably a sign of greater interest in the association and serve as collateral effect for women wanting to borrow money.

The coefficients (-42802.19) of farm size was negative and statistically significant at 10.0% level of significance. This implies that the amount of credit accessed by the women from self help group decrease with increase in farm size.

Although the negative coefficient of farm size is at variance with *a priori* expectation, it suggests efficiency in the use of land rather than expansion of cultivated areas as a necessary requisite that could increase the amount of credit accessed from women self help group led micro financing of farms. Also, this is an indication that women's rights of access to land are still regarded as secondary to those of men and many customs suggest that women's access to land is still mediated via patrilineal systems (Aluko and Amidu, 2006).

Table 5
Multiple regression analysis result of the factors influencing the volume of fund accessed from women self help group led micro financing of farms in Isuikwuato LGA of Abia State

Variable	Coefficient	Standard error	t-value
Constant	339274.7**	134996.9	2.51
Age	168.7753	2053.521	0.08
Education	42021.95**	18932.27	2.22
Marital status	167782.5**	83685.38	2.0
Household size	2058.241	17598.06	0.12
Farm size	-42802.19*	26120.97	-1.64
Farm income	0.0012684	0.5499539	0.00
Amount contributed	5.335807**	2.336078	2.28
Years of borrowing	14155.6*	7198.172	1.97
Interest rate	37990.23	25948.79	1.46
R^2	0.5294		
Adjusted R^2	0.4952		
F-ratio	15.47***		

***, **,* denote significant at 1.0%, 5.0% and 10.0% alpha level respectively

CONCLUSION AND RECOMMENDATION

The research established that the mean loan size accessed by the women from self help group was appreciably high. The research revealed also that the mean volume of farm credit accessed by the women from women self help group was greater than that obtained outside the women self help groups in the area. Meanwhile, the critical determinants of the volume of funds accessed from the women self help groups by the women were education, farm size, marital status, years of borrowing and annual cash contribution of the respondents. Since increased savings is a necessity among women and a veritable instrument which enables them make meaningful investments in agriculture, it is only rational that such women should join high performing women self help group that would give them opportunities of making reasonable savings in a year. This will encourage thriftiness in their individual farm businesses and reduce their dependence on loans from outside.

REFERENCES

Aluko, B.T., and Amidu, A. (2006) Women and land rights reforms in Nigeria. Paper presented at 5th FIG regional conference, on promoting land administration and good governance. Accra, Ghana, March 8-11, 2006.

Anyiro C.O., Ezeh C. I., Ijioma J C., Udensi A. I. (2014) Local institutions' micro credit delivery and effects on rural farm households' poverty in Abia State, Nigeria. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development.* Vol. 14 (1): 21-28.

Durno, J., and Stuart R. (2005) Gender issues in sustainable agriculture. In Gender roles in development projects Overholt C. (ed.) New Delhi Fox Publisher, New Delhi, India. 24-37

Enabulele, H. N. and G.O Alufohai, (1991) Linking financial Self-Help Groups with the Banks: Some implications for poverty alleviation in Edo State, Nigeria" in Poverty Alleviation and Food Security in Nigeria. Nigeria Association of Agricultural Economists (NASE), Kayod Nigeria Limited, Ibadan.

Essein, U. A. (2009) Gender, informal credit markets and determinants of credit use by food crop farmers in Akwa Ibom State of Nigeria. M.Sc. Thesis. Michael Okpara University of Agriculture, Umudike, Nigeria.

Ezeh C.I, Anyiro C.O., Ehiemere I.O and Obioma N.Q (2012) Gender issues in poverty alleviation programmes in Nigeria: The case of the National Fadama 1 Development Project in Abia State, Nigeria. *Agris on-line Papers in Economics and Informatics.* 4(3): 15-20.

Ezeh, C.I and C.O. Anyiro (2013) The impact of micro financing on poverty levels of rural Women Farm Households in Abia State, Nigeria; Implication for Policy Intervention. *Journal of Central European Agriculture.* 14(2):168-180.

Food and Agricultural Organisation (FAO) (2004) Sustainable development and management wetlands; Wetland contribution to livelihoods

in Zambia. Food and Agricultural Organization (FAO), Rome, Italy.

Hoddinott, S.A. (1998) Implementation of the poverty alleviation programme: Lilongwe, Malawi MIT press p.12.

Ijere, M.O. (1991) "Agricultural credit policies in Nigeria: A review of achievements, problems and prospect". *Economic and Financial Review* Central Bank of Nigeria (CBN) 23 (4): 40-47.

Njoku, J.E and Odii MACA (1991) Determinants of loan repayment under the Special Emergency Loan Scheme (SEALS) In Nigeria. A Case Study of Imo State. *African Review of money, Finance and Banking*. FIN Africa Italy Vol. 2 (6): 35

Nwankwo, I.I.M. (2004) "Impact of community banks on women farmers' poverty levels in rural Abia State, Nigeria". MSc. Thesis Department of Agriculture, Abia State University Uturu, Nigeria.

Nwaru, J.C. (2003) Gender and relative production efficiency in food crop farming in Abia State, Nigeria. *Nigerian Agricultural Journal*. 34:1-10.

Nwaru, J. C. (2004) Rural credit markets and resource use in arable crop production in Imo State, Nigeria. Ph.D. Dissertation, Michael Okpara University of Agriculture, Umudike, Nigeria.

Nwaru, J.C. (2011) Determinants of informal credit demand and supply among food crop farmers in Akwa Ibom State, Nigeria**.** *Journal of Rural and Community Development* Vol.6 (1) 129–139.

National Population Commission (NPC) (2007) Census Report. National Population Commission (NPC), Umuahia, Abia State, Nigeria.

World Bank (1996) Nigeria: Poverty in the Midst of Plenty. The Challenge of Growth with inclusion. Report No. 14733 – UMI.

Constraints to Adoption of Recommended Fish Technologies among Homstead Catfish Farmers in Ebonyi State, Nigeria

Nwaobiala, C. U. and Nzeakor, F. C.
Department of Rural Sociology and Extension
Michael Okpara University of Agriculture Umudike, Abia State, Nigeria
Correspondence E mail: cunwaobiala@gmail.com

ABSTRACT

Constraints to *adoption of recommended fish technologies among homestead catfish farmers in Ebonyi State, Nigeria were investigated in this study. Multistage random sampling procedure was used in selecting agricultural blocks, circles and homestead catfish farmers. The sample size was 120 homestead catfish farmers. Data was collected on farmers' socioeconomic characteristics, level of adoption of fisheries technology and constraints to adoption. Data was analyzed using descriptive statistics such as frequency counts, percentages and mean. Results indicate that fertilization of pond/water management and fingerlings production ($\bar{X}$ = 4.1), pond construction ($\bar{X}$ = 3.9), feeding rate ($\bar{X}$ = 3.7), stocking rate ($\bar{X}$ = 3.8) and harvesting and processing ($\bar{X}$ = 3.8) were the catfish technology packages adopted by farmers. Constraints to adoption of catfish technology packages amongst homestead catfish farmers were unavailability of hybrid fingerlings ($\bar{X}$ = 2.6), fish diseases ($\bar{X}$ = 2.3), water pollution (M=2.2), high cost of fish feed ($\bar{X}$ =2.1) and infrequent visit by extension workers ($\bar{X}$ = 2.3). Policies aimed at encouraging farmers' access to extension education, subsidy of farm inputs, availability and effective distribution of improved fish seeds were advocated for increased catfish production.*

Keywords*:* Catfish technologies, Homestead catfish farmers, Fingerlings production

INTRODUCTION

Nigeria has natural endowment for aquaculture production through virtually uninterrupted year round environmental condition. Ebonyi State is surrounded by numerous rivers, swamps, with abundant rainfall, effective harvesting and storage surface water and run off which undoubtedly favour fish farming (Egwu, 2001). Catfish, particularly *Heterobranchus spp* is the specie of choice generally accepted and grown in monoculture by fish farmers in the State (Nwosu *et al*., 2001). Notwithstanding, the natural endowment of the state, low production and productivity have characterized this sub sector, thereby limiting its ability to form the traditional role of economic development. It is assumed that farmers make adoption decision based upon utility consideration and comparing various technologies that are available. Farmers will adopt a technology if its utility exceeds the utility of others (Louis, 1999).

Fish production in Nigeria is either capture fisheries (Artisanal fishing and small-scale fish farming) or by importation. Subsistence fish farming involves dig dung seasonal ponds in the well developed fish water flood plains and enclosure tank, or swamps to retain fish at the recession of the flood water with little or no management, resulting to subsequent low yield. (Sikoki and Otobotekere, 1999).The contributions of fish to the existence of man cannot be over emphasized being a good source of animal protein. It plays a vital role in the nutritional diet of man serving as source of employment and income (FAO, 2001). However, fish consumption is gaining wide prominence particul0arly in developing countries where 40% or more of their protein comes from fish (Amaefula *et al*., 2010). This is because fish is more affordable, palatable and readily available than other sources of animal protein, less tough, more digestible and its acceptability cut across religion, ethnics and cultural boundaries (Ekeocha *et al*., 2010). The FAO (2006) estimated the total demand for fish in Nigeria at 2.1 million tonnes at 11.5kg per capita consumption whereas the domestic production is 452,460 metric tonnes. Fish contain high level of essential sulphur containing amino acids with low; cholesterol and fat content, thus often recommended in the diets of high blood pressure, diabetic and obesity patients, (Nwosu, *et al*., 2001). Apart from nutrition, fish contribute to Millennium Development Goal (MDG) through providing employment opportunities and generation of revenue for local and national government from licences and taxation. More so, fish is a source of livestock feeds and fish oil is

used in pharmaceutics/ companies (Isiebor *et al*., 2006).

Fish farming as a branch of aquaculture is defined as the raising of fish for immediate family consumption or as commercial ventures (FAO 2006). Voluntary service overseas (2002) described fishing as the rearing of fish in a controlled volume of water, but when it is raised in an enclosure, it is known as a pond. There are about 7,823 fish ponds and 8 lakes, covering about 2089.01 million cubic meters of water within the middle belt and coastal fishing zones having the highest number. This indicates that Nigeria has a high potential for fish production (Adikwu, 1999). Fish farming is relatively a new study in Agriculture. It is about 50 years old in Nigeria (Olukunle 2004; Olagunju *et al.,* 2007). Halfrick (2003) opined that fish can be grown in tanks of nearly every shape and size. Fish tanks typically are rectangular, circular or oval in shape, and in earthen and concrete ponds. The size of the tank or pond depends on a variety of factors including: stocking rate, species selected, water supply, water quality and economic considerations.

However, it's obvious that fish supply from marine and freshwater capture fisheries cannot meet the growing global demand for aquatic production. The quantity supplied is consistently lower than the increasing demand, thus an importation of about 800,000 tons (valued at $900 million) in 2009,that later increased to about one million tons before early 2011 was made to augment the shortage (Marcela and Uche, 2010). Ogundale (2007) in a study on backyard fish farming found that fish farmers need training on management practices in order to adopt recommended fish technologies. Adoption is an evidence of technology acceptability and use achievement of Millennium Development Goals (MDG's) of eradicating extreme hunger and poverty by 2015 as well as achieving food security by 2020. This depends to a large extent on the innovation adopted by farmers, factors that influence adoption of technologies by farmers which ranges from level of education, farm level constraints to technologies, gender and social barriers to inappropriate technology in an environment (Chambers 1993, Ezebuiro 2009). Innovation worth of adoption by farmers must be compatible with existing farming systems, norms, values and belief of farmers. The information on improved technology or change programme through agencies has in recent time's generated conflictions in rural and traditional societies. These usually move dramatic when the idea for scale is at variance with the prevailing norms, belief systems are values of the rural communities. Adequate market inventories would encourage farmers to be market oriented and adopt more improved technologies than at present (Kughur, 2011). For fish farming to excel technologically there is need for the adoption on recommended technologies of fish farming using homestead which is convenient to use low level of adoption of improved technologies. Improper packaging of research results thus leading to misinterpretations, release of vague technologically not feasible, economically unviable and culturally incompatible technologies, lack of adequate manpower in the extension delivery outfits, inadequate logistic support and extension massages skewed in favour of crops (Ugboh 1999, Nwachukwu 2003).

Many improved fish technology packages has been developed and disseminated to farmers in the study area without considering the constraints to their adoption. There is a dearth of information hence; the broad objective of this study is to assess the adoption of fish production technologies by homestead catfish farmers in Ebonyi State, Nigeria. Specifically the study, estimated average socio-economic statistics of homestead catfish farmers in the study area, ascertained the levels of adoption of fish technology packages by homestead catfish farmers in the study area and identified constraints to catfish production in the study area

METHODOLOGY

The study was conducted in Ebonyi State, Nigeria. Ebonyi is primarily an agricultural producing region. The three agricultural zones in Ebonyi State namely; Ebonyi North, Ebonyi central and Ebonyi south were used for this study. A multistage random sampling procedure was adopted in the selection of blocks, circles and catfish farmers. First two blocks were randomly selected from each of the three zones namely Abakiliki and Ebonyi from Ebonyi North Agricultural zone; Ezza South and Ikwo from Ebonyi Central Agricultural zone and Afikpo South and Afikpo North from Ebonyi South Agricultural zone. This gave a total of six (6) blocks. From the selected blocks, two (2) circles each were randomly selected to give a total of twelve (12) circles. Finally five (5) contact catfish farmers were randomly selected from the selected circles and this gave a total of sixty (60) catfish farmers. A structured questionnaire was used in soliciting information on farmers' socioeconomic characteristics, level of adoption of fish technologies and constraints to adoption of the technologies. Data were analyzed with descriptive statistics such as frequency counts, percentages and mean scores. Problems associated with adopting fish technology packages among catfish farmers was measured using a 7–item rated on a 3-point likert type scale of very serious, moderately serious and less serious and scored as 3, 2 and 1 respectively. A midpoint was obtained and based on the mid score decision rule, any mean score greater than or equal to

2.00 implied a serious problem and mean score less than 2.00 denotes no serious problem.

Model specifications

The adoption of recommend fish technology packages by catfish farmers were determined using adoption score analysis. This is in accordance with Okoye *et al*., (2009). It will be achieved using 7 point likert Scale

1	Unaware	O
2	Aware	1
3	Interest	2
4	Evaluation	3
5	Trial	4
6	Accept	5
7	Reject	6

Farmers with adoption score of 3.0 and above were regarded as having reached average score of technology, that is, they are at evaluation stage, while farmers with adoption score of less than 3.0 where either at unaware, aware and interest stages.

The mean adoption score is determined thus

$$Xs = \frac{\Sigma X}{n}$$

Xs of each was computed by multiplying the frequency of each response pattern with its appropriate nominal value and dividing the sum with the number of respondents to the items.

This can be summarized with the equation below

$$Xs = \frac{\Sigma fn}{nr}$$

Where Xs = mean score

Σ = Summation

f = Frequency

n = Likert nominal value

nr = Number of respondents

$$Xs = \frac{0+1+2+3+4+5+6}{7} = \frac{21}{7} = 3$$

RESULT AND DISCUSSIONS

Socioeconomic characteristics of homestead catfish farmers in Ebonyi state Nigeria

The data on Table 1 shows the average statistics of catfish farmers in Ebonyi State, Nigeria. On the average, a typical homestead catfish farmer was 45.12 years. This shows that the framers were in the age range of making decision on adopting catfish production recommended strategies. This will help in risk aversion and efficient use of available resources disposed to the farmer. The catfish farmers had 9.22 years of education and 14.2 years of farming experience. The mean value for education among farmers reveal that the they did not complete secondary education, hence education is thought to enhance adoption of technologies Unamma, (2004).The average pond size of the farmers was 7m^2 with an average extension contact of 4.5 times in a month. The mean size of the ponds is encouraging since fish farming is practiced on homestead. The size of pond is dependent on the stocking rate which in turn translates to profit. The result of extension contact is not surprising because most ADP's in the country are faced with the challenges of funding and inadequate extension staff Naswem, (2007)

Table 1
Average statistics of homestead catfish farmer in Ebonyi state, Nigeria

Variables	Mean	Standard deviation	Minimum	Maximum
Age of the farmer (years)	45.12	12.01	22	31
Educational level (years)	9.22	4.07	4	14
Farming experience (years)	14.2	14.10	6	12
Pond size (m^2)	7	2.10	4	32
Extension visits (number of times)	4.5	0.34	0	6

Levels of adoption of fish technology packages among homestead catfish farmers in ebonyi state, Nigeria

Results in Table 2 shows that a fairly good proportion of catfish farmers (41.7%) with a mean adoption score of 3.3 and 36.7% with mean adoption score of 3.8 indicated that pond construction and stocking rate were accepted and adopted respectively. Also 56.7 percent and 35 percent of the farmers adopted fertilization of pond/water management ($\overline{X}$= 4.1) and feeding/feeding rate ($\overline{X}$= 3.7) respectively. Furthermore, 25 percent and 48.3 percent of the respondents adopted test cropping and fingerlings production with means of 3.3 and 4.1 respectively. Finally, a fairly good proportion of the farmers (45%) with a mean of 3.8 adopted harvesting and processing technology packages. Since the mean adoption scores of these packages were above 3.0, it shows that the technologies were fully adopted by the homestead catfish farmers.

Table 2
Levels of Adoption of Fisheries Technology Packages among Catfish Farmers inEbonyi State, Nigeria.

TEP	Unaware	Aware	Interest	Evaluation	Trial	Accept	Reject	Total	Mean adoption
Pond Construction	5 (8.33)	2 (3.3)	4 (35)	57 (28.3)	20 (8.3)	125 (41.7)	24 (6.7)	237	**3.91**
Stocking Rate	4 (6.7)	3 (5)	6 (5)	21 (11,7)	70 (23.3)	88 (36.7)	42 (11.7)	230	**3.8**
Fertilization of pond/Water Mgt	2 (3.3)	4 (6.7)	8 (6.7)	15 (3.3)	32 (13.3)	170 (56.7)	18 (10)	247	**4.1**
Feeding/Feeding Rate	2 (3.3)	10 (16.7)	4 (6.7)	21 (.11.7)	52 (21.7)	105 (35)	30 (8.3)	222	**3.7**
Test Cropping	4 (6.7)	3 (5)	20 (16.7)	42 (23.3)	48 (20)	75 (25)	12 (3.3)	200	**3.3**
Fingerlings Production	3 (5)	5 (8.3)	2 (1.7)	9 (5)	64 (26.7)	145 (48.3)	18 (5)	243	**4.1**
Harvesting and Processing	3 (5)	6 (10)	10 (8.3)	9 (5)	56 (23.3)	135 (45)	12 (3.3)	228	**3.8**
Total Mean Adoption Score									**261**
Mean ($\overline{X}$)									**3.7**

Decision Rule = 3.0 and Above = Adoption
Values in Parentheses are Percentages
Where, TEP = Technology Packages

Farmers' constraints to catfish adoption in Ebonyi state, Nigeria

The constraints encountered by homestead catfish farmers in adopting fish technology packages in the study area are presented in Table 3. The result indicates that unavailability of hybrid fingerlings ($\overline{X}$= 2.58), Fish diseases ($\overline{X}$= 2.37) and water pollution ($\overline{X}$= 2.27) were problems encountered by homestead catfish farmers in the study area. Improved fingerlings have proved to produce early maturing and healthy table fishes, thus attracting higher price. One of the most important problems that have limited fish production and led to folding of some fish farms in Ebonyi State is diseases which consume a lot of capital (Danveura and Fuller, 1999). High cost of fish feed ($\overline{X}$= 2.10) and infrequent visits by extension workers ($\overline{X}$= 2.03) were also ascribed problems of the catfish farmers. High cost of feed as a problem has an implication on the total cost of production of catfish, thereby affecting farm gate price of the commodity. Extension contacts have shown to enhance the adoption of farming technologies there by giving confidence to the agent on the innovation he/she is disseminating (Imoh and Essien, 2006).

Table 3
Constraints associated with catfish adoption in ebonyi state, Nigeria

Constraints	Very Serious	Moderately Serious	Less Serious	Total	Mean
Unavailability of Hybrid Fingerlings	40(120)	15(30)	5(5)	155	**2.58***
High Cost of Fish Feed	33(99)	18(36)	9(9)	126	**2.10***
Fish Diseases	28(84)	20(40)	12(12)	138	**2.37***
Water Pollution	132(73.33)	20(16.67)	6(10)	158	**2.27***
Lack of Storage FacilitiesMarketability	23(66)	10(20)	27(27)	113	**1.88**
Infrequent Visits By Extension Agents	23(66) 24(72)	9(18) 14(28)	28(28) 22(22)	112 122	**1.86** **2.03***

Decision Rule 2.0 and above is Serious
Less than 2.0 is Less Serious, Very Serious 3, Moderately Serious 2, Less Serious 1
Values in parentheses are nominal Likert values multiplied by frequencies

CONCLUSION AND RECOMMENDATIONS

The study has revealed that homestead catfish farmers adopted all the technology packages (pond construction, adequate stocking rate, fertilization of pond/water management, feeding rate, test cropping, fingerlings production and harvesting and processing) disseminated by extension to their contact farmers in the study area. Unavailability of hybrid fingerlings, fish diseases, water pollution, high cost of fish feed and infrequent visit by extension workers were the major adoption problems encountered by homestead catfish farmers in the study area, it is recommended that;

1. Farmers access to information about fish farming technologies packages need to be sustained. This underscores the importance of disseminating information to the potential farmers about the technology, considering the fact that there are barriers hindering such.
2. Access to education for the catfish farmers is advocated to enhance the acceptance of any technology package transferred.
3. Formation of cooperative societies is advocated. This will encourage access to credit and farm inputs such as fingerlings and fish feed at reduced costs.
4. Stakeholders in the fishery sector and research institutes are encouraged to develop hybrid fingerlings that will give higher returns to the farmers. This will encourage the unemployed youths to engage in catfish production as a poverty alleviation strategy.

REFERENCES

Adikwu, I. A. (1999) Aquaculture in Nigeria Prospects and Constraints. *Journal of Fisheries Technology* 1016 – 27.

Amaefula, A.A, Onyenweaku, C. E and Asumugha, G.N. (2010) Economic efficiency of fish production in Delta State Nigeria. *The Nigeria Agricultural Journal* Vol. 41 (2): 39-44.

Chambers R. (1993) *Challenging the Professions Frontiers for Rural Development,* Intermediate Technology Publications, London United Kingdom

Danvenra, C. and Fuller M.E (1999) *Fish Production in the Tropics* Published by Oxford University Press.

Egwu P.C. (2001) Yields of the African catfish,(*Clarias gariepinus*) from a low input homestead fish concrete pond in Umudike, Abia State. *Nigeria Agricultural Journal* Vol. 38 (1): 170-175.

Ezebuiro N. C, Chinaka, C.C. and Chukwu G.O. (2009) gender issues in adoption of improved cassava varieties in Umuahia Agricultural Zone of Abia State. Nigeria *International Journal of Agriculture, Food and Ecosystem Research* Vol. 1 (1):191 -197.

Food Agriculture and Organization (FAO) (2001) Fresh water fish farming: Better Farming Series No. 27 Food and Agriculture Organizations of the United Nations Pp 2.

Food and Agricultural Organization (FAO) 2006: Fisheries Technical Paper No. 407. Rome FAO, Pp. 149.

Helfrick C. (2003) Fish farming in Recirculation Aquaculture Systems (RAS).*www.ri-sa. gov.av/aquaculture/http/aquatic.org* accessed July 2003.

Imoh, A.N. and Essien, M.U. (2006) Adoption of improved cassava varieties among small scale farmers in Ikot Ekpene Agricultural Zone of Akwa Ibom State, Nigeria. *Global Approaches to Extension Practices* Vol. 2(2): 41-50.

Isiebor, E.A, Wosika. L. and Smith, S.V (2006) Preliminary water salt and nutrient budget for Lagos Lagoon, Nigeria http/data Ecology Selumode/Africa/Lagos/htm Retrieved April, 2007.

Kughur P.G. Dauda S. and Onu O.E. (2011) Factors affecting adoption of poultry innovations by rural farmers in Otukpo Local Government Area of Benue State *Proceedings of the 49th Annual Conference at the Agricultural Society of Nigeria*. Halvat Usman Danfodiyo University Sokoto Nigeria. 24thOctober 19 – 22.

Louis, A. (1997) Consideration for perspective fish growers: Seminar Paper Presented at the Aquaculture Department of Fisheries and Wildlife Science Virginia Technology Pp. 1- 3.

Marcela, R. and Uche, N. (2010) Strong Demand Continues Expanding Fish Exports to Nigeria. *Gain Report*. Global Agricultural Information Network. USDA. Foreign Agricultural Services.

National Population Commission (NPC) (2006) Population Census of Federal Republic of Nigeria. Analytical Report at National Level.

Naswem, A. A 2007: Agricultural Extension in Nigeria Policy Imperatives For the 21st Century . *Proceedingsof the 10th Annual Conference of Agricultural Society of Nigeria(AESON)* April 8-11 2007 Pp 27-33.

Nwachukwu A.N. (2003) *Fish farming Aspect of Agriculture*. Will Rose and Applessed Publishing Copy, Ebonyi State Nigeria.

Nwosu, M.C, Nwadukwe, P and Udealor, A. (2001) On farm evaluation of fish productivity

and acceptability of two poly culture system in Anambra State. *Proceedings REFILS Workshop* Held at Umudike, Abia State, Nigeria.

Ogundale I. (2007) Backyard fish farmers' information needs in Osun State Nigeria *A. E. Conference Proceeding* Pp. 165 – 169.

Olagunju, F. I. (2007) Economic liability of catfish production in Oyo State, Nigeria. *Human Ecology Journal* Vol. 21: 121 – 124.

Olukunle, O. (2004) *Homestead and Fish Management*. John Archers Ltd Ibadan Nigeria.

Sikoki F.D., Otobotekere C. (1999) Fisheries in aqua land and people of Bayelsa State, Nigeria. Onyema Research Publication Port Harcourt River State Pp 201 – 317.

Ugboh C. (1999) *Introduction of Rural Sociology of Agricultural Extension Education*. Publishers Development Cambridge University Press.

Unamma, R.P.A. (2004) Agricultural Technology Generation and Transfer Strategies for Food Security. *Proceedings of the 6th Annual Zonal Research and Extension Farmers Input Linkage Systems (REFILS) Workshop* South and South/South Zone of Nigeria 12 – 13 November, 2004

Voluntary Services Overseas (VSO) (2002) Fish farming in tropical fish water ponds. *Human Resources Development* World Wide Waging Northern Land 116p.

Influence of Varying Energy and Protein Levels on the Performance and Feed Cost of Broiler Chickens

G. O. Adeyemo, M. T. Madamidola and [1]T.I. Ademulegun
Department of Animal Science, Faculty of Agriculture, University of Ibadan, Nigeria
[1]Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria
Email: gbemiadeyemo7@gmail.com

ABSTRACT

The influence of varying energy and protein levels on performance, carcass evaluation and gut morphology of broiler chickens were investigated in a 56-day feeding trial. A total of 192 one-day old Arbor acre broiler chickens were fed 6 diets at the starter and finisher phases. The diets were Recommended Energy-Recommended Protein (RERP, control), Recommended Energy-Lower Protein (RELP), Lower Energy-Recommended Protein (LERP), Lower Energy-Lower Protein (LELP),Higher Energy-Recommended Protein (HERP) and Higher Energy-Lower Protein (HELP). Birds were fed ad-libitum for 8 weeks and weighed weekly to determine their performance. Final body weight, average body weight gain and feed intake were recorded while the feed conversion ratios were determined. Feed cost in Naira (₦) per kilogramme/diet for the six diets were determined. No significant (P>0.05) differences were recorded in the final body weight, average body weight gain and feed intake. Although, HERP and HELP diets enhanced these parameters. Feed conversion ratio were significantly (P<0.05) lowest in birds fed HERP and HELP diets. Birds on these treatments utilized their feed efficiently. Feed cost were significantly (P<0.05) influenced by varying energy and protein in diets. Feed cost increased with increased energy level. Diets with LELP had the least feed cost. In conclusion, feeding broilers with HERP and/or HELPgave better performance with an increased feed cost. However, lowering energy and protein in broiler diets will reduce feed cost at the expense of the bird's performance.

Keywords: Metabolisable energy, Crude protein, Broiler performance and Cost benefit

INTRODUCTION

Longe in 2006 reported that the cost of feed ingredients could be as high as 80% of the total cost of production of finished feed while 60-80% estimation was reported by Durunna *et al*. (2005). In poultry production, the regimes of dietary protein and energy ratios both in the tropics and temperate climates are important though dynamism have been found due to improvement in breeds of chickens as the years go by. Energy is required for body functioning and protein is an essential constituent of all animal tissues. Hunton (1995) found that nutrient intake can be influenced by different levels of energy in diet. It is generally assumed that when birds eat more, they have higher body weights at market age. Improvement in body weight has been attained due to an increase in feed consumption, which is related to genetics (Havenstein *et al.*, 1993) and supported by nutrition.Feed cost can be reduced by decreasing the energy and/or amino acid content in the diet, but this must be counterbalanced by potential losses in broiler performance such as Body Weight (BW) gain, Feed Efficiency (FE) and meat yield (Corzo *et al.,* 2005; Kidd *et al.,* 2005). Protein, having major effect on growth performance of the bird, is the most expensive nutrient in broiler diets (Kamran *et al*., 2004).

While formulating a broiler diet, the main emphasis is placed on the Crude Protein (CP), because the protein level in broiler diet strongly affects performance and feed cost, and thereby, profitability of a broiler production enterprise (Eits *et al.,* 2004).On the other hand, if high dietary energy and amino acid are provided to the birds, it may not affect broiler performance but will increase the feed cost. Hence, it is important to consider feed cost and broiler's performance to amino acid and energy in the diet to maximize margin. To maximize profit and margin, it is also important to understand feed cost and broiler performance when various energy and amino acid contents are provided to the birds. This study was carried out to further provide information on the impart of various levels of energy and protein on broiler performance and feed cost

MATERIALS AND METHODS

A total of 192 one-day old Abor acre broiler chickens were randomly alloted to six dietary treatments with each group having 32 broilers. The experiment lasted for 8 weeks. Combination of various levels of energy and protein were used. Recommended Energy-Recommended Protein (control), Recommended Energy-Lower Protein, Lower Energy-Recommended Protein, Lower Energy-Lower Protein, Higher Energy-

Recommended Protein, Higher Energy-Lower Protein as presented in Tables 1 and 2.

The total feed given to birds and feed consumed were recorded weekly to estimate the total feed intake per week. The average daily feed intake were also estimated by dividing the feed intake by number of birds.

Birds were weighed weekly to record their body weight while the body weight gain was calculated as the difference in the final weight and initial weight of birds. The average weight gain was calculated by dividing the body weight gain by the number of days.

Feed Conversion Ratio = $\frac{\text{Average feed intake (g)}}{\text{Average weight gain (g)}}$

The total feed cost incured per bird were estimated by dividing the sum of the cost feed ingredient, bagging, milling, and transport by kilogramme of feed produced.

All data collected from each treatment for all the parameters considered were subjected to Analyses of Variance (ANOVA) The means were separated using Duncan's multiple range test.

Table 1
Percentage composition of experimental starter diets

Ingredients	Diets					
(g/100g)	1	2	3	4	5	6
Maize	49.00	52.00	55.00	56.00	52.15	54.35
Wheat offal	5.00	5.00	4.65	5.00	0.00	0.00
Groundnut Cake	25.00	23.00	25.00	22.00	23.50	22.00
Fullfat Soya	8.65	8.00	5.00	7.12	9.50	9.50
Fishmeal	4.00	3.55	5.00	4.50	5.00	4.50
Palm Oil	3.00	3.00	0.00	0.00	4.50	4.50
Bone Meal	3.00	3.00	3.00	3.00	3.00	3.00
Oyster Shell	1.50	1.50	1.50	1.50	1.50	1.50
Broiler Premix	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.10	0.11	0.10	0.10	0.10	0.10
Lysine	0.25	0.34	0.25	0.28	0.20	0.25
Salt	0.25	0.25	0.25	0.25	0.25	0.25
Calculated values						
ME	3083	3087	2939	2938	3241	3244
CP (%)	23.06	21.52	23.73	21.81	23.46	21.80
CF (%)	3.17	3.09	3.07	3.08	2.79	2.75
Met (%)	0.45	0.45	0.46	0.45	0.46	0.45
Lys (%)	1.20	1.21	1.20	1.20	1.20	1.20

ME- Metabolizable Energy, CP- Crude Protein, CF- Crude Fibre, Met- Methionine, Lys- Lysine, W/O – Wheat Offal, FM- Fish meal, P/O – Palm oil, GNC- Groundnut Cake, BP- Broiler Premix, FFSB- Full fat Soybean, O/S- Oyster shell, Imgr. – Ingredients

1- Recommended Energy and Recommended Protein
2- Recommended Energy and Low Protein
3- Low Energy and Recommended Protein, 4- Low Energy and Low Protein
5- High Energy and Recommended Protein, 6- High Energy and Low Protein

Table 2
Percentage Composition of Experimental Finisher Diets

Ingredients	Diets					
(g/100g)	1	2	3	4	5	6
Maize	58.00	59.00	58.00	59.00	59.74	60.69
Wheat Offal	2.00	3.30	5.04	6.00	0.00	0.00
Groundnut Cake	15.00	12.51	17.50	16.02	12.00	11.00
Fullfat Soya	15.40	16.07	12.00	12.00	18.00	18.00
Palm Oil	3.81	3.80	1.60	1.60	5.00	5.00
Bone Meal	3.00	3.00	3.00	3.00	3.00	3.00
Oyster Shell	1.50	1.50	1.50	1.50	1.50	1.50
Broiler Premix	0.25	0.25	0.25	0.25	0.25	0.25
Methionine	0.11	0.13	0.11	0.13	0.11	0.12
Lysine	0.18	0.20	0.25	0.25	0.15	0.20
Salt	0.25	0.25	0.25	0.25	0.25	0.25
Calculated values						
ME	3217	3212	3052	3048	3342	3348
CP (%)	19.92	18.77	19.78	19.48	20.44	19.12
CF (%)	2.94	3.00	3.13	3.15	2.78	2.75
Met (%)	0.40	0.41	0.40	0.41	0.40	0.41
Lys (%)	1.04	1.01	1.03	1.02	1.00	1.02

ME- Metabolizable Energy, CP- Crude Protein, CF- Crude Fibre, Met- Methionine, Lys- Lysine, W/O – Wheat Offal, FM- Fish meal, P/O – Palm oil, GNC- Groundnut Cake, BP- Broiler Premix, FFSB- Full fat Soybean, O/S- Oyster shell,

1- Recommended Energy and Recommended Protein
2- Recommended Energy and Low Protein
3- Low Energy and Recommended Protein, 4- Low Energy and Low Protein
5- High Energy and Recommended Protein, 6- High Energy and Low Protein

RESULTS AND DISCUSIION

Dietary treatments had no significant ($p>0.05$) influence on the average daily feed intake. Treatment 3 recorded the highest feed intake (82.74g/bird) while birds on treatment 4 had the lowest feed intake of (76.66 g/bird) as compared to treatments 1, 2, 5 and 6 which had mean values of 83.04, 80.37, 82.34 and 80.73 g/bird respectively. Thelevel of crude protein and metabolizable energy in diets did not influence the birds feed intake. This agrees with the report of Ferguson *et al*. (1998) who noted no effect on feed intake by decreasing crude protein from 20.4 to 18.8% during the starter phase. Han *et al.*(1992) also found no difference in feed intake of broilers when the crude protein contentof their diet was decreased from 23 to 20%. Kamran *et al.*(2004) also reported a non-significant effect of energy and protein dilution on feed intake. Birds fed low energy and crude protein diets had the lowest feed intake in this study. This is in agreement with the report of Dairo *et al.*(2010) who found a lowered feed intake for birds fed diets with low energy and low protein. Our observation however was contrary to some other studies.Kamran *et al.*(2008) found feed intake to linearly increase with decreasing crude protein and metabolizable energy. Bregendahl *et al.* (2002) and Nawaz *et al.*(2006) also reported increased feed intake inbroilers fed diets having decreased metabolizable energy and crude protein contents. Birds fed recommended energy and low protein had a lower feed intake as compared to the control diet with recommended energy and protein. This is contrary to what Fatufe and Rodehutscord (2005) reported that there were no effect or even increased feed intake when birds were fed low protein and normal energy diets.

The average body weight gain (g/bird) had no significant ($p>0.05$) variation across treatments. However, the highest mean value was recorded in treatment 5 (41.41g/bird) as compared to treatments 1, 2, 3, 4 and 6 with average body weight gain 39.94, 37.31, 38.96, 37.96 and 40.64 g/bird respectively.This study showed that birds fed high energy-recommended protein and high energy-low protein diets had the highest final body weight and body weight gain when compared to the control diet having recommended energy and protein levels. This could be attributed to the high energy level in the diet which was sufficient to meet the bird's energy requirement and convert the excess to carcass and also allowing the available protein to be used up in gaining body weight. This result agree with the work ofReginatto *et al*.(2010) who reported an improved performance with higher levels of dietary energy. Growth rate was improved by increasing dietary energy concentration (Sizemore and Siegal, 1993). These reports are contrary to that of Leeson *et al.*(1996) who found that dietary metabolizable energy had less effect on growth performance. Similar responses in final body weights and body weight gains were observed in birds fed recommended energy-low protein and low energy-low protein. This showed that lowering the protein level of broiler diets influenced the bird's overall body weight gain. Aletor *et al.*(2000) also reported that the performance in terms of growth is adversely affected by low protein diets. Ferguson *et al.*(1998) and Jacob *et al.*(1994) also reported that feeding low crude protein diets to broiler reduced growth performance. Dean *et al.*(2006); Fatufe and Rodehutscord (2005) also said broiler performance was not compromised even when low crude protein diets were formulated to contain 22.2 and 22.9%. Reduction in the final body weight of birds fed low energy-low protein in this study is in agreement with the research of Leeson *et al*.(1996) who reported that dilution of dietary energy and protein significantly reduced growth rate. Kamran *et al.*(2008) also reported that weight gain was linearly decreased as dietary crude protein and energy decreased.

There were significant ($p<0.05$) difference in the Feed Conversion Ratio (FCR) among treatments. Birds on treatments 5 and 6 responded similarly to the diets and had the lowest feed conversion ratio of 1.99. There were no significant ($p>0.05$) difference among treatments 1, 3 and 4 with mean values 2.08, 2.12 and 2.03 respectively while birds on treatment 2 had the highest feed conversion ratio.There were no significant variations ($p>0.05$) among the final body weight (g/bird) of birds fed the different diets, although birds on treatment 5 recorded the weight of 2358.20 g/bird compared to the other treatments 1, 3 and 6 with mean value 2275.50, 2220.50 and 2314.90 g/bird respectively. However, birds on treatment 2 and 4 had the lowest values (2127.60 and 2164.90 g/bird respectively) when compared to other treatments.This study showed that birds fed high energy-recommended protein and high energy-

low protein diet had the best feed to gain ratio with low feed conversion ratio of 1.99 irrespective of the low protein or recommended protein levels fed to the birds. This could indicate that birds were able to adequately utilize the excess energy for growth even when protein levels were loweror equal to the recommended levels. It could also be attributed to better dietary digestibility since energy plays a major role in the digestion and absorption of nutrients. Sizemore and Siegel (1993) reported an improved feed conversion ratio by increasing the dietary energy concentration. Sadeghi and Tabiedian (2005) also found a decreased feed conversion ratio in birds fed high energy diets in a period of 7 – 21 days. This is contrary to the report of Jafarnejad and Sadeghi (2011) who reported that there were no differences in the feed conversion ratio of birds fed high energy-normal protein diets. This study also showed that birds fed low energy-recommended protein diet and recommended energy-low protein diet had an increased feed conversion ratio while those on low energy-low protein diets had a relatively reduced feed conversion ratio when compared to the control. This is contrary to the report of Kamran *et al.* (2008) who reported an increased feed conversion ratio as dietary protein and enrgy decreased. There were also an increased feed conversion ratios when birds were fed diets with recommended energy-low protein. This could mean that birds were consuming more feed and growing more slowly.

There were significant (P<0.05) difference in the feed cost among dietary treatments. There were no significant (P>0.05) difference in the feed cost of treatments 5 and 6. However, treatment 5 had the highest feed cost of ₦521.42/kg. There were significant (P<0.05) difference in the feed cost of the control diet (₦490.45/kg) as compared to other treatments while treatments 2 and 3 had no significant (P>0.05) difference with mean values ₦471.42/kg and ₦470.00/kg respectively. The feed cost of diet 4 had the least value (₦444.83/kg) and significantly (P<0.05) varied from other diets.

The calculated cost analysis in naira per kilogramme of feed showed that feeding broiler chickens with high energy-recommended protein or high energy-low protein diets increased the cost of feed while feeding birds with a low energy-low protein diets reduced the cost of feed. This is in agreement with the report of Corzo *et al.*(2005) who said that feed cost can be reduced by decreasing the energy level of diets although this must be counterbalanced by potential losses in broiler performance such as body weight gain, feed efficiency and meat yield (Kidd *et al.,*2005).

Table 3
Performance traits of broilers fed varying energy and protein levels in a 56-days feeding trial

Parameters Measured	Diets 1	2	3	4	5	6
Final Body Weight	2275.50	2127.60	220.50	2164.90	2358.20	2314.90
Body Weight Gain	39.94	37.31	38.96	37.96	41.41	40.64
Average Feed Intake	83.04	80.37	82.74	76.66	82.34	80.73
Feed Conversion Ratio	2.08^{ab}	2.16^{a}	2.12^{ab}	2.03^{ab}	1.99^{b}	1.99^{b}
Feed Cost (N/Kg)	490.45^{ab}	471.42^{bc}	470.00^{bc}	444.83^{c}	521.42^{a}	509.60^{a}

a, b, c, Treatment means with different superscript in the same row are significantly (p<0.05) different.
FCR – Feed Conversion Ratio, BW-Body Weight (g/bird), BWG-Body Weight Gain (g/bird/day), FI-Feed Intake (g/bird/day), DW- Dressed Weight (%).
1- Recommended Energy and Recommended Protein
2- Recommended Energy and Low Protein
3- Low Energy and Recommended Protein
4- Low Energy and Low Protein
5- High Energy and Recommended Protein
6- High Energy and Low Protein

CONCLUSION

Feeding broilers with High Energy Recommended Protein and/or High Energy Low Protein gave better performance with an increased feed cost. However, lowering energy and protein in broiler diets will reduce feed cost at the expense of the bird's performance.

REFERENCES

Aletor, V. A., I. I. Hamid, E. Niess, and E. Pfeffer (2000) Low protein amino acidssupplemented diets in broiler chickens: Effects on performance, carcass characteristics, whole bodycomposition and efficiencies of nutrient utilization. *Journal of Science. Food and Agriculture*. Vol. 80:547-554.

Bregendahl, K., J. L. Sell, and D. R. Zimmerman. (2002) Effect of low protein diets ongrowth performance and body composition of broiler chicks. *Poultry. Science* Vol. 81:1156-1167.

Collins, A., R. D. Malheiros, V. M. B. Moraes, P. Van As, V. M. Darras, M. Taouis, E.Decuypere, and J. Buyse. (2003) Effects of

dietary macronutrient content onenergymetabolism anduncoupling protein mRNA expression in broiler chickens.*British Journal of Nutri*tion Vol. 90:261-269.

Corzo, A., M. T. Kidd, D. J. Burnham, E. R. Miller, S. L. Branton, and R. Gonzalez-Esquerra. (2005) Dietary amino acid density effects on growth and carcass of broilers differingin strain cross and sex. *Journal of Applied Poultry Research* Vol.14:1-9.

Dairo, F.A.S., Adeshinwa, A.K., Oluwasola, T.A. and Oluyemi, J.A. (2010) High and low dietary energy and protein levels for broiler chickens. *African Journal of Agricultural Research* Vol. 15: 2030-2038.

Dean, D. W., T. D. Bidner, and L. L. Southern (2006) Glycine supplementation to lowprotein,amino acid-supplemented diets supports optimal performance of broilerchicks. *Poultry. Science*. Vol. 85:288-296.

Dozier, W. A., III, and E. T. Moran, Jr. (2001) Response of early and late-developingbroilers to nutritionally adequate and restrictive feeding regimens during thesummer. *Journal of Applied Poultry Research* Vol. 10:92-98.

Dozier, W. A., III, and E. T. Moran, Jr. (2002) Dimension and light reflectance of broilerbreastfillets: Influence of strain, sex, and feeding regimen. *Journal of Applied. Poultry. Research*.Vol. 11: 202-208.

Durunna, C. S., Udedibie, A.B.I and Uchegbu, M.C. (2005) Effect of dietary inclusion of Anthonata macrophyla meal on the the performance of broiler starter chicks. *Nigerian Journal of Animal Production*, Vol. 32(2): 268-273

Eits, R. M., R. Meijerhof, and G. Santoma (2004) Economics determine optimal proteinlevels in broiler nutrition. *World poultry*. 20:21-22.

Fatufe, A. A., and M. Rodehutscord (2005) Growth, body composition, and marginalefficiency ofmethionine utilization are affected by nonessential amino acidnitrogen supplementationin male broiler Chicken. *Poultry Science* Vol. 84:1584-1592.

Ferguson, N. S., R. S. Gates, J. L. Taraba, A. H. Cantor, A. J. Pescatore, M. J. Ford, andD. J. Burnham (1998) The effect of dietary crude protein on growth, ammoniaconcentration, and litter composition in broilers. *Poultry Science*Vol. 7: 1481-1487.

Han, Y., Suzuki, H., Parsons, C.M., Baker, D.H. (1992) Amino acid fortification of a low protein corn and soybeanmeal diet for chicks. *Poultry Science*Vol.71 1168–1178.

Havenstein, G. B.; Scheideler, S. E.; Ferket, P. R. and Rives, D. R. (1993) Carcass composition and yield of 1957 vs. 1991-type broilers when fed typical 1957 and 1991-type diets. *Poult.* 72 (Suppl 1): 169. (*Abstr).*

Hunton, H. (1995) *Poultry production* Ontario, Canada, pp 53 – 118.

Jacob, J.P., Blair, D.C., Bennett, T.R., Scott and Newberry, R.C. (1994) The effect of dietary protein and amino acid levels during the grower phase on nitrogen excretion of broiler chickens. Page in: *Proceeding of Canadian Animal Science Meeting* of Saskatchewan, Saskatoon, SK, Canada.

Kamran, Z., M.A. Mirza, A.U. Haq and S. Mahmood, (2004) Effect of decreasing dietary protein levels with optimum amino acids profile on the performance of broilers. *Pakistan Veterinary. Journal* Vol. 24: 165-168.

Kamran, Z., M. Sarwar, M. Nisa, M. A. Nadeem, S. Mahmood, M. E. Babar and S. Ahmed (2008) Effect oflow protein diets having constant energy-to-protein ratio on performance and carcass characteristics of broiler chickens from one to thirty-five days of age. *Poultry Science*Vol. 87:468-474.

Kidd, M. T., W. S. Virden, A. Corzo, W. A. Dozier III, and D. J. Burnham. (2005) Amino acid density and L-threonine responses in Ross broilers. *International Journal of Poultry Science. 4:258-262.*

Leeson, S., L. Caston and J.D. Summers, (1996) Broiler response to energy or energy and protein dilution in the finisher diet. *Poultry Science* Vol. 75: 522-528.

Leeson, S., L. Caston, and J. D. Summers (1996) Broiler response to diet energy. *Poultry Science*75:529-535.

Nawaz, H., Mushtaq, T., Yaqoob, M. (2006) Effect of varying levels of energy and protein onlive performanceand carcass characteristics of broiler chicks. *Journal of Poultry. Science* Vol. 43: 388–393.

Jafarnejad S. and M. Sadegh M. (2011) The effects of different levels of dietary protein, energy and using fat on the performance of broiler chicks at the end of the Third Weeks. *Asian Journal of Poultry Science* Vol.5: 35-40.

Reginatto, M.F., Ribeiro, A.M.L., Penz Jr. A.M., Kessler, A.M. and Krabbe, E.L. (2000) The effects of energy, energy:protein ratio and growing phase on the performance and carcass composition of broilers. *Rev. Bras. Cienc. Avic*., 3: 229-237.

Sadeghi, G.H. and S.A. Tabiedian (2005) Effect of different energy to protein ratio and tallow

supplementation on broiler performance. *International Journal of Poultry Science* Vol. 4: 976-981.

Si, J., Fritts, C.A., Burnham, D.J., Waldroup, P.W. (2004) Extent to which crude protein may be reduced incorn-soybean meal broiler diets through amino acid supplementation. *International Journal of Poultry Science* Vol. 3 46-50.

Sizemore FG, Siegel HS (1993) Growth, feed conversion, and carcasscomposition in females of four broiler crosses fed starter diets withdifferent energy levels and energy to crude protein ratios. *Poultry Science*.,Vol 72: 2216-2228

Livelihood Status of Households within Igbo-Ora Community of Oyo-State, Nigeria

***Ayinde, Yewande A., Oyesola, O. B. and Oladeji J. O.**
Department of Agricultural Extension and Rural Development
University of Ibadan, Ibadan, Nigeria.
*Corresponding author: yewandeayinde@yahoo.com
Tel: 234-7033321439

ABSTRACT

This study examined the livelihood status of households within Igbo-Ora community of Oyo state. Forty households were sampled in each of the five quarters that constitute the study area through systematic random sampling technique to give a total of 200 respondents. Quantitative method was used in gathering data on livelihood abilities, assets and activities for the study. Both descriptive and inferential statistics were used to analyze data at 0.05. Results of analysis revealed that 57.0% of respondents had low level of livelihood abilities while, respondents had had high level of access to natural (57.3%), physical (54.0%) and financial capitals (54.0%). Accesses to social and human capital were low for 61.5% and 52.0% respondents respectively, with 60.0% having high level of livelihood activities. Most (55.0%) of the households had low livelihood status. There was a significant difference between the five quarters in terms of their livelihood status (r=0.043). Result of regression shows that livelihood abilities (0.652) and livelihood assets (0.489) contributed more to low respondents' livelihood status. It is concluded that the livelihood status of households within Igbo-Ora is low because of the low livelihood abilities and assets of the respondents which contributed more to the low livelihood status. It is recommended that capacity building activities should be carried out by governmental and non-governmental organisations using extension models to improve abilities to perform economically viable agricultural activities in order to improve their status.

Keywords: Abilities, Assets, Activities and Livelihood status

INTRODUCTION

In developing countries, where majority of families, in both farm and non-farm sectors, derive their livelihoods from agriculture, sustainability of agriculture cannot be discussed or even defined in isolation of the issue of livelihoods. As defined by Ellis (2000a), livelihood is made up of the capabilities, assets (stores, resources, claims and access) and activities necessary for means of making a living. Abilities do not only include the degree of physical strength or weaknesses, but also knowledge, skills, training and years of experiences in the livelihood activity (Oyesola and Ademola, 2011). Assets are the basic materials or social, tangible or intangible services, resources, skills or attribute. They are the physical, natural, social, financial and human resources that people use for structuring their livelihoods. Activities are said to be strategies in which individuals adopt using the abilities and resources to produce goods and services for the purpose of income earning both monetary and non-monetary. Alternatively, there may be opportunities to diversify into off-farm and non-farm income-earning activities. Basically, income generating activities are activities performed by individual households, using their abilities that is, knowledge, skills, and years of experience in producing goods and services that are marketable for exchange of money as a source of income, while non- income generating activities are understood in the sense that individual households transforms the group in which they belongs not for earning monetary income but as well exploring their resources towards securing their livelihood.

Rural livelihoods are often vulnerable to risks and shocks, due to climate variability, human and livestock diseases, pests, flooding, unfavourable markets, institutional deficiencies. These can present risks and inhibit livelihood endeavours. Vulnerability refers to both exposures to unfavourable developments like rainfall failure, or livestock loss that would cause considerable harm to one's livelihood; as well as the lack of means to cope with the loss without losing the household's livelihood base (Chambers, 2006).

Household is taken as a unit of reference in this study because it is the most important institution through which population, share income

and consumption (FAO, 2006). The reduction in land access, declining crop yields, seasonality do affect rural farmers livelihood activities which makes them to diversify from their primary occupation of farming to other off-farm such as petty trading, okada riding, bricklaying, and non-farm such as labourer in other person's farm, processing of farm produce, marketing of farm produce as other means for securing their livelihood. But the sustainability of livelihoods from these activities that are expected to redeem them from poverty remains doubtful. Poverty reduction strategies generally aim to improve the asset holdings of the poor, either by endowing them with additional financial human, natural, or social assets. In this context, households' revealed preference among livelihood strategies and the feasible set of strategies among which different households can choose. The study of diversification behaviour offers important insights as to what might be effective in reducing poverty and vulnerability.

This can happen through identification of either effective means of targeting transfers to the poor or the food insecure, or impediments to the smooth functioning of factor markets in labour, land and capital that condition households' on-farm and off-farm investments. Although rural livelihood diversification can be relevant as household farmers diversify from their primary occupation to off-farm earning activities in order to generate savings and invest these funds either in farm-related activities or non-agricultural endeavours as a result of improved food security, increased income and improved well-being. The study assessed the livelihood status of households within Igbo-Ora community by providing answers to the following research questions:

- What are the livelihood capabilities/ abilities of hsouseholds in the study area?
- What are the livelihood assets that households have access to in the study area?
- What livelihood activities do households engaged in the study area?

METHODOLOGY

Area of study

The study was carried out in Igbo-Ora in Ibarapa Central Local Government Area of Oyo-state. Igbo-Ora is bounded in the north by Idere, in the east by Eruwa, in the west by Ogun river, and lies in the derived savannah zone of Oyo state. The annual rainfall is between 70-80cm. Igbo- Ora community has five quarters namely; Ibeerekodo, Sagahun, Paako, Igbole and Idofin.

Population of study

The target population of study were all household-heads that are within Igbo-Ora community of Oyo-State.

Sampling procedure and sample size

Systematic random sampling technique was used to sample 40 respondents each from Ibeerekodo, Sagahun, Paako, Igbole and Idofin quarters within Igbo-Ora resulting in a total number of 200 respondents. This was done by sampling every 10th house from a designated starting point in each of the quarters.

Measurement of variables

Livelihood abilities was measured with a scale of willingness to pursue education(Nominal scale); Skilful activities involved (Ordinal scale); amount of work done (hrs/day-Interval scale); number of active labour (Interval scale); training (Nominal scale-Indigenous-1, Informal-1, Formal-1);years of experience (Interval scale); Sources of finance(Ordinal scale-Self-1, Informal-2, Formal-3); ownership of production(Ordinal scale-Own some-1, Own most-2, Own all-3); and infrastructural support(Ordinal scale-Poor-1, Fair-2, Good-3). The score is then, summed up to give the minimum, maximum and mean scores, while the mean score was used to categorise households into low and high livelihood abilities. Thus, mean and above were categorised as high livelihood abilities and respondents with scores below mean score were categorised as low livelihood abilities.

Livelihood assets were measured with a checklist of quantity and quality of physical, social, human, financial and natural assets. Natural assets- Number and size (Interval scale); Access (Nominal scale-Wet season-1, Dry season-1). Physical assets- Availability (Nominal scale-Yes-1, No-0); Access (Ordinal scale-All the time-4, Most times-3, Sometimes-2, Never-1); State of the facilities (Ordinal scale-Poor-1, Fair-2, Good-3). Social assets-Membership (Nominal scale-Yes-1, No-0); Number of years of membership (Interval scale). Financial assets-Availability (Nominal scale- Yes -1, No-0); Access (Ordinal scale-Always-4, Most times-3, Few times-2, Never-1) Volume of fund(large-3, Average-2, Small-1). Human capital –Educational level (Ordinal scale-Non-formal-1, Primary-2, Secondary-3, Tertiary-4); Contribution to livelihood activity (Ordinal scale-High-3, Average-2, Low-1); Medical treatment (Ordinal scale-Often-1, Rarely-2, Never-3). The mean score for each of capital assets was obtained to sum up total livelihood assets score for each household. The overall assets were calculated through addition of standardized scores of each of the components (natural, physical, social, financial and human capital). Mean score calculated was used to categorise respondents with high or low livelihood assets. Hence, respondents with average mean and above were categorised as

high livelihood assets and below mean score were categorised as low livelihood assets.

Livelihood activities were measured with a scale of income generating activities both agricultural and non-agricultural. Involvement (Nominal scale-Yes-1 No-0), Frequency of involvement (Always-3, Sometimes-2, Never-1), Income earning annually and monthly (Interval scale). The total livelihood activities score for each respondent was obtained from the sum of the mean scores of the respondents' livelihood activities score.

Livelihood status was measured by summing up the total score of livelihood abilities, livelihood assets and livelihood activities. The standard scores for each of the three components were computed. The standard scores for the three variables (livelihood abilities, assets and activities) of each respondent were summed to form composite total scores for livelihood. Total livelihood status for each respondent was obtained from the sum of total mean score of each respondent for the three variables (livelihood abilities, assets and activities) to categorise household as those with high and low livelihood status. Mean score and above were used to categorise respondents with high livelihood status and below mean were used to categorize respondents with low livelihood status.

Data analysis

Descriptive statistics such as frequency counts, percentages and means and inferential statistics such as Pearson Product Moment Correlation, Analysis of Variance and regression) were used to analyse data collected.

RESULTS AND DISCUSSION

Livelihood abilities

Livelihood abilities were based on amount of work done, number of active labour, training, years of experience, Sources of finance, ownership of production and infrastructural support with respects to respondents prioritized activities as people have combination of activities in order to face sudden shocks. First prioritized activities said to be combination of activities which as shown in table 1 that majority (43.0%) of the respondents worked 6-10 hours/day, 47.0% of respondents had informal training while 48.0% of respondent had 1-10 years of experience. Farming activities said to be their second prioritized activities which is not consistent with Department of Agricultural Extension and Rural Development Need Assessment Report (2013) findings that farming is regarded as their primary occupation in Igbo-Ora. Majority (34.0%) worked within 1-5 hours/day, 36.0% of respondents worked 4-6 days/weeks, 36.0% with indigenous training. This implies that the farming activities they engaged in, was through inheritance from fore-fathers since almost all of inhabitant of Igbo-ora practice farming as one of their income generating activities but not their main occupation as shown in result of analysis from table 1 to be their second ranked occupation. Majority (41.5%) of the respondents had 1-10 years of farming experience as well as self source finance (73.0%), own all production (41.0%) while 66.0% had good infrastructural support. Also, the third prioritized activities reveals from table 1 said to be trading as majority (8.0%) of respondents worked 1-5 hours/ day and only 1.5% of the respondents worked 6-10 and above 10 hours/day. Only 5.5% worked 1-3days/week. As majority (5.5%) in the third prioritized activities had indigenous form of training in performing this activity. 3.5% of the respondents had 1-10 years of trading experience and above 40 years respectively. 9.0% of respondents sourced fund individually to finance their trading activities, in addition, 4.5% of the respondents owned all production while 7.0% of the respondents had good infrastructural support on the trading activities. This implies that majority of the respondents had more than one activity they engaged in, for them to earn their living. The limited hours' and days' with respect to average labour is because most respondents distribute their time among various income generating activities, which consequently affect the growth and the development of any of those activities. Since majority of respondents have variety of activities, indigenous and informal training is most prevalent in the community but the majority is said to be indigenous form of training because they diversify to farming activities. Majority source fund by themselves in making their production this is partly because there is no registered formal financial or cooperative institution in which government and NGO's can be of support to better their livelihood.

Table 2 shows that 57.0% had low level of livelihood ability, while 43.0% had high level of ability. This further explained that respondents had low capability to increase their socio-economic status as corroborated Oyesola and Ademola (2011) that Ileogbo residents had low capacity to increase their livelihood activities and socio-economic status. This implies that low livelihood ability had unfavourable influence on their activities which falls back on their socio-economic status. Therefore, there is need for more extension support in terms of capacity building complementing with training in order to improve their knowledge and skills for better livelihood within the households context.

Table 1
Distribution of respondents based on their livelihood abilities

	Prioritized livelihood activities		
	Combination of activities	Farming	Trading
Variables	Freq (%)	Freq (%)	Freq (%)
Labour (hours/day)			
1-5	49 (24.5)	68 (34.0)	16 (8.0)
6-10	86 (43.0)	58 (29.0)	3 (1.5)
>10	65 (32.5)	28 (14.0)	3 (1.5)
Labour (days/week			
1-3	53 (26.5)	65 (32.5)	11 (5.5)
4-6	120 (60.0)	72 (36.0)	8 (4.0)
>6	27 (13.5)	16 (8.0)	3 (1.5)
Training			
Informal	94 (47.0)	49 (24.5)	8 (4.0)
Formal	37 (18.5)	32 (16.0)	6 (3.0)
Indigenous	69 (34.5)	72 (36.0)	11 (5.5)
Years of experience			
1-10	96 (48.0)	83 (41.5)	7 (3.5)
11-20	49 (24.5)	32 (16.0)	6 (3.0)
21-30	29 (14.5)	27 (13.5)	1 (0.5)
31-40	17 (8.5)	6 (3.0)	1 (0.5)
>40	9 (4.5)	7 (3.5)	7 (3.5)
Sources of finance			
Self	193 (96.5)	146 (73.0)	18 (9.0)
Informal	6 (3.0)	4 (2.0)	3 (1.5)
Formal	1 (0.5)	5 (2.5)	1(0.5)
Ownership of production			
Own some	17 (8.5)	15 (7.5)	6 (3.0)
Own most	76 (38.0)	58 (29.0)	7 (3.5)
Own all	107 (53.5)	82 (41.0)	9 (4.5)
Infrastructural support			
Fair	13 (6.5)	23 (11.5)	8 (4.0)
Good	187 (93.5)	132 (66.0)	14 (7.0)

Table 2
Distribution of respondents based on level of livelihood abilities

	Frequency	Percentage
Low (< 146)	114	57.0
High (≥ 146)	96	43.0
Total	200	100.0

Level of capital assets

The results of analysis as shown in table 3 revealed that 57.5%, 54.0% and 54.0% of the respondents had high level of natural, physical and financial capital respectively while 61.5% and 52.0% of the respondents had low level of social capital and human capital. This indicates that the respondents had access to available land and water because of the farming activities concentrated in the community. This negotiate a balanced access to their physical asset (such as farm tools and where to market the produce) recognizing the natural resource for the purpose of generating income which as a result of boosting their financial assets by making profit from the enterprise and also accessing informal savings groups as a major source of finance in rural communities. This further infers that social capital and human capital were low because religious group and age-grade only contributed to their social life which is not enough because peoples were born in one religion or the other. Ebitigha (2008) states that access to social capital is low, while human capital uncovers the contribution of household member in determining the human assets declines as those members stay apart. The household unit which made the respondents to have low access to human capital as corroborated Oyesola and Ademola (2011) that states that Ile-Ogbo residents had low access to human capital.

Table 3
Distribution of respondents based on their level of capital assets

Variables	Low F (%)	High F (%)	Total F (%)
Natural capital	85 (42.5)	115 (57.5)	200 (100.0)
Physical capital	92 (46.0)	108 (54.0)	200 (100.0)
Social capital	123 (61.5)	77 (38.5)	200 (100.0)
Financial capital	92 (46.0)	108 (54.0)	200 (100.0)
Human capital	104 (52.0)	96 (48.0)	200 (100.0)

Livelihood activities

Result of analysis from table 4 shows that 46.0% of respondents had low level of on-farm livelihood activities, while majority (54.0%) of respondents had high level of on-farm livelihood activities.0.5% had low level of off-farm livelihood activities while majority (99.5%) of the respondents had high level of off-farm livelihood activities. Also 7.5% of respondents had low level of non-farm livelihood activities while majority (92.0%) of respondents had high level non-farm livelihood activities. This further explained that there was a balance in their livelihood activities in Igbo-ora community because majority had high livelihood activities since they diversify to perform combined activities in order to improve household long run resilience in face of adverse trends or sudden shock. This implies that respondents had access to multiple activities which makes them distribute their time on those activities with no concentration on one activity as a means of securing a living.

Table 4
Distribution of respondents based on level of livelihood activities

Variables	Low F (%)	High F (%)	Total F (%)
On-farm activities	92 (46.0)	108 (54.0)	200 (100.0)
Off-farm activities	1 (0.5)	199 (99.5)	200 (100.0)
Non-farm activitie	15 (7.5)	185 (92.5)	200 (100.0)

DFID (2001) stated that livelihood activities are economic activities that people know, own and undertake to earn income today and into the future. Table 5 reveals that 40.0% of the respondents had low level of livelihood activities while 60.0% of

respondents had high level of access. This can be explained by the inherent capabilities and assets undertaken by households which tend to have positive impact on their livelihood activities as corroborated by Ellis (1997) that the processes by which rural families construct a diverse portfolio of activities in their struggle for survival and in order to improve their standards of living. Although it is ascertained that the livelihood abilities of Igbo-ora is low, yet, it can still be effectively utilize with the abundance of their capital assets especially natural capital resulting to high livelihood activities.

Table 5
Distribution of respondent based on their level of livelihood activities

Level of livelihood activities	Frequency	Percentage
Low (< 31)	80	40.0
High (≥ 31)	120	60.0
Total	200	100.0

Livelihood status

This is the position of household on livelihood components such as livelihood abilities, assets and activities. Result of analysis from Table 6 reveals that majority (55.0%) of the respondents had low livelihood status while 44.5% had high livelihood status. This is because majority of the respondents had low level of abilities and assets as this are components of livelihood. Although, majority of respondents had high level of livelihood activities, as this cannot mainly influence the livelihood status since it only for them to make combinations of activities in order to earn income but yet is not sustainable to their livelihood status.

Table 6
Distribution of respondents based on level of livelihood status

Level of livelihood status	Frequency	%
Low	111	55.5
High	89	44.5
Total	200	100.0

Test of difference in livelihood status of Igbo-Ora quarters

Table 7 indicates that there was a significant difference in the livelihood status of households across the five quarters in Igbo-Ora community. The reason that can be explained for this observation can be due to different cultural backgrounds that each of the five segments of Igbo-Ora came from. Results of analysis shows that the significant difference exists because the five quarters had different cultural background, ethnic group and livelihood activities that vary across the quarters, as farming is more prominent in one quarters than the other. Although, Igbo-Ora community seem to be one community but corroborating the qualitative report that people migrated from different places to settle in Igbo-Ora now becoming indigene of the community. This was further explained according to qualitative report that Paako, Igbole and Sagan-un had similar ethnic background while Idofin and Ibeerekodo are from different ethnic group between the quarters but Idofin quarters is mainly Yorubas. Other quarters had Igbos, Hausas, Fulani and Ghanaians as long-term migrants. These migrants had no access to natural capital especially land, which prompted some of them to go on lease for farming activities contributing to the significant difference in their livelihood. However, similarity exists between Paako, Igbole and Sagan-un on their socio-economic status but yet, majority are better-off than average in Igbole quarter has this may influence their livelihood status. This is because their background differs from one another, as it influences their abilities on their activities towards better livelihood status.

Table 7
Analysis of Variance of the Difference in the livelihood status of households between the five quarters in the study

	Sum of squares	Df	Mean square	F	Sig.	Decision
Between Groups	70949.067	4	17737.267	2.508	0.043	S
Within Groups	1379220.394	195	7072.925			
Total	1450169.461	199				

P> 0.05= not significant (NS) F=F statistics

Regression analysis of abilities, assets and activities on livelihood status

Result of analysis on Table 8 shows that livelihood assets, livelihood abilities contributed more to livelihood status of Igbo-Ora community at the rate of 0.489 and 0.652 respectively. Only livelihood activities had lesser (0.024) contribution to livelihood status. This implies that abilities and assets should be build upon in terms of hours spent on their activities per day in order to have a lesser time spent towards promoting their livelihood status. Also, social capital in terms of social networking within the community should be build upon likewise the number of children in the household unit as they put more weight on the household expenses but also providing a means

of labour force to the household for an improved livelihood status. As capacity building assets and abilities restructures the transforming structure of livelihood activities as a one of the livelihood component that contributes to the development of the community since respondents had a multiple portfolios towards its sustainability for better livelihood.

Table 8
Contribution of livelihood abilities, livelihood assets and livelihood activities to livelihood status

Variables	Beta	T	Sig
Constant		0.000	1.000
Livelihood assets	0.489	3.8E + 008	0.000
Livelihood activities	0.024	20857686	0.000
Livelihood abilities	0.652	5.3E + 008	0.000

R= 1.000[a]; R^2=1.000; Adjusted R^2=1.000;
Std. Error= 0.00000; Sig at 0.05

CONCLUSION

Based on the findings of the study, the followings conclusions are hereby drawn:

- Livelihood abilities of respondents are low in terms of inadequate knowledge and skills on their income generating activities which contributed more to low livelihood status. Also, their labour in terms of hours/day and days/week tends to limit their activities production as majority distribute their time on multiple activities they involved.
- Respondents' level of access to livelihood assets is low because majority had high access to natural, financial and physical capitals while low social and human capitals contributed more to low livelihood status.
- Respondents are involved in agricultural and non-agricultural activities as this influences their high level of livelihood activities within Igbo-Ora community. There are diverse portfolios in Igbo-Ora in which respondents were engaged and they have additional portfolios to their primary occupation which means livelihood diversification in order to cope with insufficiencies and uncertainties.
- Respondents' livelihood status differs across the five quarters within Igbo-Ora..
- Livelihood assets and abilities contributed more to low livelihood status.

The following recommendations are hereby made based on the above conclusions;

- Provision of capacity building training, in terms of workshops and extension services in order to improve their abilities (knowledge and skill) towards better livelihood outcome.
- Mobilization of the community members into social groups to improve their rights, claims or access to capital assets, customers' relation, which also serve as form of social network in promoting livelihood.
- Capacity building of programme should be livelihood activity specific because of diversity and diversification of livelihood.

REFERENCES

Bryceson, D. F. 91999) African rural labour, income diversification and livelihood approaches. A long term Sdevelopment perspective. *Review of African PoliticalEconomy* Vol.80(1): 171–189

Chambers, R., and G. Conway. (1992) Sustainable Rural Livelihoods: Pratical Concepts for The 21st century. Institute of Development Studies (IDS) Discussion Paper 296. Brighton, Sussex, UK. 9p

Department of Agricultural Extension Rural Development (2013) Interim College of Medicine-Igboora Needs Assessment Report. 3-4

Department for International Development (DFID) (2001) Sustainable Livelihoods Guidance Sheets Section2. London. From <http:www.livelihoods. org/info/guidance_sheets_pdfs/section2.pdf> (Retrieved on 27 January, 2010).

Ebitigha O. (2008) *Effects of Livelihood Diversificationon Rural Households Socio-economic Status in Osun State, Nigeria*. M.Sc. Thesis, Unpublished.Ibadan: University of Ibadan.

Ellis, F. (1997) Household Strategies and Rural Livelihood Diversification. Paper submitted to the Journal of Development Studies.

Ellis, F. (2000a) Rural livelihoods and diversity in developing countries. Oxford: Oxford University Press

Ellis F. (2000b). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics* Vol. 51(2): 289-302

Ellis, F., Kutengule, M., and A. Nyasulu (2003) Livelihoods and rural poverty reduction in Malawi. *World Development* Vol.31(9), 1495-1510.

Food and Agriculture Organisation (FAO) (2006) The state of food insecurity in the World. *FAO Policy Brief* June (2) Rome: Food and Agriculture Organisation.

Oyesola,O.B and A.O, Ademola (2011) Livelihood in University of Ibadan Social Laboratory in Ileogbo Community of Osun State, Nigeria. *Journal of Human Ecology* Vol. 34(2): 91-100

Little, Peter D., Kevin Smith, Barbara A. Cellarius, D. Layne Coppock and Christopher B. Barrett (2001) "Avoiding Disaster: Diversification and Risk Management among East African Herders," *Development and Change*

Agricultural Extension Agents' Occupational Stress in Southwest State's Agricultural Development Programme

[1]Bolarinwa, K.K. and [2]Oyeyinka, R.A.
[1&2] Department of Agricultural Administration
Federal University of Agriculture Abeokuta Nigeria

ABSTRACT

The study examined the balance between extension agents work demand and capability of meeting it, since, World Bank withdraw their support. A simple random sampling technique was used to select 120 extension officers to examine the incidence of occupational stress in south Western states' Agricultural Development Programmes. Data were collected with a structured questionnaire and analyzed using frequency counts, percentages and multiple regression analysis. Majority (62.5%) of the extension officers were male and 52.5% with Bachelor Degrees in Agriculture. Majority (91.7%) of the extension agents had more than 10 years working experience. Extension officers out of 5 categories of jobs stress, ranked factors unique to the job and career development first and second respectively as the work stress they were experiencing within the organisation. The most prominent job stressors under each 5 categories of job stressor indicated by extension officers were: work load (85.0%), role conflict (65.0%) , over promotion(80.0%) , supervisor and subordinate (58.0%) and management style (65.0%). Significant correlation existed at p<0.05 between work stressors and manifestation of stress among extension workers within the organisation. The study found that job stressors manifested among extension agents and recommended training on work stress management for them.

Keywords: Work stressor, Workload, Extension agent, Stress, Roles conflict.

INTRODUCTION

In Nigeria, the responsibility of transferring agricultural information and innovation to farmers is usually coordinated by government owned agricultural extension outfits called Agricultural Development Programme. Transformation of Nigerian agriculture from its subsistence nature to large scale farming is anchored on this organisation. The central ideal of the organisation is to employ competent and well informed extension agents who will frequently and regularly visit farmers with relevant technical messages and bring farmers problem to researchers. They play a critical role in any extension service. The success or failure of any extension programmes depends on effective performance by extension agents. In developing countries, extension agents are the main actors in delivering extension services to farmers. Röling (1988) and Berhanu, Kwarteng, Okorley (2013) in listing the essential components of extension services in Africa , puts Extension Agents(EAs) as critically necessary stakeholders because majority of the farm households are unable to read and write and have low opportunities to get support from other sources. Food and Agriculture Organization of the United Nations (FAO), also listed six roles of an extension agent (EA), to include arousing people to recognize and take an interest in their problems; achieving transformation of attitudes, behaviours, and social organizations; linking government and people; setting in motion; helping people to form their own organizations; an activist; and a professional who influences the innovation and decision making processes in a desirable direction (Berhanu et al,2013).

All occupations are accompanied by stress factors that individuals must learn to cope with. Stress is a term commonly used to describe feelings of tensions or exhaustion usually associated with work overload or overtly demanding work. The extension agents all over agricultural development programmes are currently undergoing work overload and overly demanding work because the ratio of extension to farmers is too high 1:3000 instead of 1:800 recommended by the world bank.(Agricultural Development Programmes 2012) In other words, stress is considered to be any pressure which exceeds the individual's capacity to maintain physiological, psychological and/or emotional stability (Furnham, 2005). Stress is anything that changes our physical, emotional, behavioural or mental state while we counter various stimuli in our environment. Occupational stress can be described as the adverse reaction people have to excessive pressure or other types of demand on them (Health and Safety Executive, 2005).

Work stress is a reality of current day life, the issue of stress causes a great deal of stress to the employees. Workplace stress has become

one of the most serious health issues in the modern world as it occurs in any job. The working environment is significantly changing, longer hours, frequent changes in culture and structure, as well as the loss of lifetime career paths all of which lead to greater levels of stress (Fotinatos-Ventouratos and Cooper 2005). Consequences of occupational stress can be organizational symptoms such as displeasure and poor morale among staff performance/productivity losses, poor interpersonal relationships with clients, and other stakeholders, losing customers, bad publicity, damage to the institutional image and reputation, missed opportunities, high rates of accident and mistakes, high staff turnover, increased sick-leave, enduring vacancies, early retirement, diminished cooperation, poor internal communications, increased internal conflicts, and dysfunctional workplace climate. Organizational costs include reduced performance, high replacement costs in connection with staff turnover, increased sick pay, increased health care costs and disability payments, higher grievance and litigation/compensation costs, and costs of equipment damage (Chen, Silverthorne and Hung 2006). Hence ,the effects of occupational stress are devastating to both employees and employers . High levels of chronic stress can result in job dissatisfaction and aggression, as well as lead to the thickening and hardening of the heart muscles, resulting in cardiovascular disease (Rozanski, Blumenthal and Kaplan, 1999). Various physical illnesses and psychological problems have been associated with human stress. Contrary to popular belief, agriculture is no exception. As the complications and pace of agriculture have increased, many of the physical and mental demands on farmers and their families have become greater. Balancing work and family effectively is a continuous struggle for many extension organisations. Extension work often demands long working hours, including nights and weekends. Extension agents often find themselves with conflicting demands on their time and energy by clientele and administrators' expectations, family expectations, and personal priorities. In these times of uncertain funding, extension organisation face increased expectations to do more work with less, remuneration. Many extension organisations face the complications of governmental partnerships between federal and state governments where different superiors sometimes hold incompatible expectations and personnel policies.

The fact that agriculture is undergoing transformation and its pace of development is increasing, making the stakeholders, farmers, and extension agents to experience stress in coping with the agricultural complication. Hence, the quest for empirical data that extension agents experience stress informed the conduct of this research. The specific objectives for the study were to:

1. determine the stress level of the extension agents in the organization;
2. ascertain work stressors that make extension agents prone to stress .

METHODOLOGY

Multistage sampling technique was used in sampling extension agents in south-west states' Agricultural Development Programme (ADPs). The first stage focused on random sampling of 3 ADPs out of 5 ADPs south western states. Second stage focused on random sampling of 40 extension agents from the sampling frame work: that is extension agent's list in each selected state's ADP to get 120 extension agents that participated in this research. Stress was measured by using 3 point stress test rating scale of mild, moderate, and severe. The extension agents work stressor was measured by adapting Murphy (1995) categories of work place stressor. The work stressor categories variables were factors unique to the job, role in the organization, stress career development, relationships at work (interpersonal) organizational structure. Each work stressor variable consist of items that the agents reacted to Structured questionnaire was the instrument used for data collection.

RESULTS AND DISCUSSION

Personal characteristics of the extension agents

The result in Table 1 indicates the personal characteristics of extension agents. Majority (78.4%) of the extension agents were in the age categories of 20-30, 31-40, and 41-50 years. The implication of the result is that the extension agents are still in their productive age and only 21,2% of them were approaching retirement age of 60. Also 62.5% of the extension agents were male while 37,5% were female extension agents. The fact that women are farmers and the need to reach them with improved farm technologies necessitated the employment of female extension agents that are in better position to do the work of reaching rural women (Omoregbe *et al*,2009) . Majority (83.3%) of extension agents were married. Educational status of the extension agents reveals that 52.5% of them had Bachelor of Agriculture. The result contradicts the finding of Ejembi,*et al* (2006) who found that extension agents job is a low status job hence, it is meant only for job applicants possessing low academic qualification. Therefore, understanding the area where they are to work can predispose them to stress, and will increase the productivity of the highly educated extension agents. Fewer (8.3%)

of the extension agents had working experience of 5-10 years while majority (91.7%) had more than 10 years working experiences. The implication of the finding is that 91.7% of the extension agents qualified to receive gratitude and pension when they retired from the organisation hence, their commitment to the organisation will be very high. Ejembi *et al* (2006) opine that the length of service is related to person's commitment to the organisation, and with his chosen career. Hence preventing work stress in the organisation which will strengthen their commitment level on the job.

Table1
Personal characteristics of the extension agents

Variables	Frequency	Percentages
Age		
20-30	30	25.0
31-40	35	29.2
41-50	29	24.2
51-60	26	21.2
>60	-	-
Sex		
Male	75	62.5
Female	45	37.5
Marital Status		
Single	20	16.7
Married	95	79.2
Divorce	5	4.1
Educational Qualification		
O.N.D	14	11.7
H.N.D	30	25.0
B.Sc	63	52.5
M.Sc	13	10.8
Ph.D	-	-
Work experience		
5-10	10	8.3
11-15	65	54.2
16-20	30	25.0
21-25	10	8.3
26-30	5	4.2
30-35	-	-

Expression of work stress by extension agents

Result in Table 2 indicate that 2.5% of the extension agents had mild stress , 19.2% claimed to have moderate stress while about 78.3% of the extension agents experienced severe stress. The implication of this finding is that majority (78.3%) of the extension agents may likely be suffering from one or more of the following physiological stressexpressionsuch asincreased blood pressure,
increased metabolism (e.g., faster heartbeat, fast er respiration),decrease in protein synthesis, intes tinal movement (digestion), immune and allergic r esponsesystems,increased cholesterol and fatty a cids in blood for energy production systems,
localize inflammation (redness, swelling, heat and pain),faster blood clo tting, increased production of blood sugar for energy and increased stomach acids(Canadian Centre for Occupational Health and Safety, 2000). These symptoms of stress can leads to sickness of the extension agents and direct reduction of extension agent's performance of their duty.

Table2
Distribution of extension agents based on work stress experience

Variable	Stress Category scores	Frequency	Percentage
Mild	17-34	3	2.5
Moderate	35-59	23	19.2
Severe	60-85	94	78.3

Work stressors within the organisation

Out of 5 categories of jobs stressors, extension agents ranked factors unique to the job first, and career development second as shown in Table 3, as the work stress they were experiencing within the organisation. The most prominent job stressors under each of the 5 categories of job stressor as indicated by the extension agents were: work load supported by (85.0%) of the extension agents, role conflict (65.0%), under/over promotion(80.0%), relationship of ,supervisor and subordinate at work place, (58.0%) and management style (65%). These are the most prominent work place stressor experienced by extension agents in the organisation. Hence, the organisation need to factor them into staff welfare packages that will be designing to improve living standard and working condition of extension agents.

Table 3
Distribution of extension agents based on expression of work stress categories in the organisation

Categories of Work Stressors	Freq	%	Rank
Factors unique to the Job			
Workload (overload and under load)	102	85.0	
Pace / variety / meaningfulness ofwork	100	83.2	
Autonomy (e.g., the ability to make your own decisions about your ownjob or about specific tasks)	72	60.2	1st
Hours of work	79	65.5	
Physical environment (noise, airquality, etc.)	90	75.2	
Isolation at the workplace (emotionalor working alone)	66	55.4	
Role in the organization			
Role conflict (conflicting job demandsmultiple supervisors / managers)	78	65.0	
Role ambiguity (lack of clarity aboutresponsibilities, expectations, etc.)	77	64.3	3rd
Level of responsibility	67	56.2	
Career development			
Under / over promotion	96	80.0	
Job security (fear of redundancy either from economy, or a lack of tasks or work to do)	76	63.5	2nd
Career development opportunities	63	52.5	
Overall job satisfaction	54	45.2	
Relationships at work (interpersonal)			
Supervisors	70	58.0	
Co-workers	63	52.4	5th
Subordinates	69	57.5	
Threat of violence, harassment, etc.(threats to personal safety)	64	53.0	
Organizational structure			
Participation (or non-participation) in decision making	78	65.0	
Management style	78	65.0	4th
Communication patterns	66	55.0	

Table 4
Correlation index between expression of stress by extension agents and selected work stressors within the Organisation

Categories of Work Stressors	(r)	r^2
Factors unique to the Job		
Workload (overload and under load)	0.862	0.765
Pace / variety / meaningfulness ofwork	0.563	0.452
Autonomy (e.g., the ability to make your own decisions about thejob or about specific tasks)	0.521	0.346
Hours of work	0.634	0.523
Physical environment (noise, officequality, etc.)	0.540	0.515
Isolation at the workplace (emotionalor working alone)	0.080	0.214
Role in the organization		
Role conflict (conflicting job demandsmultiple supervisors / managers)	0.722	0.567
Role ambiguity (lack of clarity aboutresponsibilities, expectations, etc.)	0.611	0.012
Level of responsibility	0.530	0.340
Career development		
Under / over promotion	0.891	0.645
Job security (fear of redundancy either from economy, or a lack of tasks or work to do)	0.007	0.026
Career development opportunities	0.560	0.125
Overall job satisfaction	0.631	0.430
Relationships at work (interpersonal)		
Supervisors	0.51	0.236
Co-workers	0.062	0.127
Subordinates	0.082	0.016
Threat of violence, harassment, etc.(threats to personal safety)	0.074	0.342
Organizational structure		
Participation (or non-participation) in decision making	0.543	0.420
Management style	0.651	0.214
Communication patterns	0.543	0.315

Relationship between expression of stress by extension agents and selected work stressors within the Organisation

The variables investigated were subjected to correlation analysis. The result presented in Table 4 shows that extension agents expressed positive significant correlation at P=0.05 with work load (r=0.86), roles conflict (0.722), under/over promotion(r=0.891) and management style(r= 0.651). It could be inferred from the result that the higher the extension agents work stressors score's per variable, the higher the expression of stress symptoms by the extension agents. Furthermore coefficient of determination as indicated in Table 5 reveals that workload, role conflict, under/over promotion and management style contributed 76.5%, 56.7%, 64.5% 21.4% respectively to stress symptoms experienced by the extension agents. Concerning workload personal interview with the extension agents reveals that some of the extension agents were covering wider areas, that is they were visiting more than 3000 thousand farmers, whereas the ratio of agricultural extension agent to farmers is supposed to be 1:700/800 (Benir, 1984, cited in Ayinde 2013) . More- over the promotion from Assistance Director, Deputy Director and Director ranks were subject to vacancy. Many of the extension agents seeking promotion to these ranks were not able to get these position, some retired without getting to the position of Director. Therefore, staff complained that subject to vacancy management policy on promotion to this cadre often breed frustration which may lead to stress among them.

CONCLUSION

This study analyzed work place stress through an examination of the relationship between extension agents expression of stress and selected work stressors indexes. Extension agents are suffering from various degree of stress. Employers would, therefore, do well to take adequate measure that will ameliorate occupational stress in their organisation.. The study shows that there is close relationship between expression of stress by the extension agents and selected workplace stressors. Therefore, controlling, and properly coordination and improvement on these work place stressors will help to improve job satisfaction thereby improving the quality of extension agents' work. A better understanding of the demographic and work factors that lead to job stress should subsequently help managers understand a greater proportion of the variance of employees' satisfaction, performance and turnover, and help them better deal with it.

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REFERENCE

Ayinde, A.F.O, Awotunde, J.M., Omotayo,M.A. and Fabusoro, E. (2013) Sustainability of Rural Women Groups in Ogun State Nigeria. *Journal of Sustainable Development* .Vol.10 (1): 15-23

Benor, D. and Baxter,N. (1984) *Agricultural Extension The Training and Visit System.* The World Bank Washington DC, USA 1-100.

.Berhanu, N.W, Kwarteng, J.A., and Okorley, E.L. (2013) Professional and technical competencies of extension agents as perceived by male and female farmers and the extension agents themselves: The need for data source triangulation .*Journal of Agriculture and Biodiversity Research.* Volume 2 (1): 11-16

Chen, J.C., Silverthorne, C., Hung, J.Y. (2006) Organization communication, job stress, organizational commitment, and job performance of accounting professionals. *Taiwan and American Leadership & Organisation Development Journal*; Vol. 30 (3): 240-55

Food and Agricultural Organisation(FAO) (1985) Guide to extension training; FAO: Rome. 1985. Pp 1-67

Fotinatos-Ventouratos, R., Cooper, C. (2005) The role of gender and social class in work stress, *Journal of Managerial Psychology*, 20(1) 14-23.

Murphy, L. R. (1995)Occupational stress manage ment: current status and future direction. *Tre nds in Organizational Behavior* Vol. 2 1-14*,*

Röling, N. (1988) *Extension Science: Information Systems in Agricultural Development.* Cambridge University Press, Cambridge, UK. 256p

Content analysis of agricultural news with and without photographs in selected Nigerian Daily Newspapers

Olajide, B. R. and Fawole, O. P.
Department of Agricultural Extension and Rural Development
University of Ibadan, Ibadan, Nigeria
Corresponding Author: r.olajide@gmail.com

ABSTRACT

Photographs have the potency to enhance farmers' understanding of news items in the print media. This, therefore, presupposes that news items on innovations in agriculture should be representative and strategically placed in the newspapers. Past studies have focused on coverage of agricultural news with little attention to whether such stories were accompanied by photographs that tell the story. This study therefore focused on content analysis of agricultural columns with and without photographs in selected Nigerian Daily Newspapers. Two Nigeria's newspapers (New Nigeria and the Guardian) were purposively selected based on geographical location, large circulation, prominence and blend of agricultural news and activities. A total of 144 news items with and without photographs were analysed using frequency and percentages for frequency, space allotment, prominence and representativeness of the photographs. Results show that most of the stories (90.3%) were accompanied with photographs with the Guardian allotting more space to photographs in general (7,902.75sqcm) compared to New Nigeria (4,190.33sqcm). However, while the Guardian had more space for agricultural produce and products (6,094.34sqcm) compared to New Nigeria's 2,143.52sqcm, New Nigeria had more space (1,092.72sqcm) for agricultural equipment than the Guardian's 820.58sqcm. Most of the photographs (62.5%) were not representative of the story lines and none was strategically placed (100.0%) in the Newspapers. It is recommended that editors should ensure that photographs for agricultural news items are representative of the content of the story lines as well as placed in strategic location as space allows in their newspapers.

Keywords: *Photographs, Prominence, Space allotment, Representativeness*

INTRODUCTION

Photograph is one of the very numerous means to achieve effective communication. It is one of the principal media of visual communication used in print media to back up stories at times as a major source of such stories. According to Oxford Dictionary, photograph is a picture that is made by using camera that has an inbuilt film sensitive to light and in the word of Ellis (n.d) and Lasén and Gómez-Cruz (2009) voicing popular adage state that it tells a thousand words. Igene (1990) says it is a mysterious phenomenon; a means that helps man to answer many questions through his five senses most importantly his sense of sight.

Photographs in the media are regarded as a means through which information produced in form of printed visual image(s) on paper is used to communicate to the mass audience. Perhaps this informs Ballenger's (2014) position that photographic methods and tools are available today to serve as a platform for social change. This is why the newspapers ensure proper documentation of events and its preservation for immediate and future consumption by the mass heterogeneous audience.

Newspapers use photography to achieve wide range of purposes. Such purposes include facilitating proper understanding of information, sustaining and stimulating the interest of the readers, ensuring the credibility of news stories, for illustrating and reinforcement of information and to captivate its audience and attract readers' attention with pictures that has a long visual context. Most times, the agricultural column of Nigerian daily newspapers contains photographs purposely to allow better understanding of the message content. Arising from this, the printed word would appear to be the best suited for mass education and mobilization of illiterate and semi-illiterate farmers who are generally slow in learning.

The function of collecting and transferring agricultural information from researchers to the farmers is sometimes done with the use of photographs that enable target audience or readers to form their own opinions concerning issues or events at hand. Better still, such

pictures enhance farmers' understanding as they can put faces to news items that carry stories on innovations in agriculture. However, like most other news items accompanied by photographs, sometimes, content of some agricultural stories were often different from the capture of the photographs in most Nigerian dailies. Media hype is a common place with newspapers implicated in banner headlines that do not match with the story contents. Based on these issues, this study answered the following questions with respect to news papers agricultural columns' use of photographs in coverage of agricultural news in selected dailies in Nigeria. .

(1) What is the frequency of stories with and the without photographs?
(2) What is the space allotted to each of the photograph in agricultural column in the selected Nigerian newspapers?
(3) Do the photographs represent the content of the information in the agricultural column?
(4) Where were the photographs placed?

METHODOLOGY

Time frame of the study and selection of newspapers

The period chosen for this study was January 2000 to December 2005. Two newspapers (New Nigerian and Guardian) were analysed for their manifest contents. The two newspapers were selected because of the geographical location, large circulation, prominence and blend of agricultural news and activities. All the editions of the two newspapers published from January 1st 2000 to December 31st 2005 constituted the study population.

Sampling procedure and sample size

This study adopted the sampling method described by Olowu (1990). It is a multi-stage sampling procedure which involved sampling of months, weeks and days from which editions of the two newspapers were selected to constitute sample size of news items (with and without photographs) used for the study. In the first stage, six months were randomly selected from each of the 6 years of the study for both papers resulting in a total of 12 months. In the second stage, from each of the months, two weeks were randomly selected from each of the four weeks of a month; hence, 24 weeks were selected at this stage. In the third and final stage of sample selection, all five week days of the weeks were considered for selection in all the 24 weeks; given 120 days and 120 news items with and without photographs. Also, a day was randomly chosen out of the weekend days resulting in 24 days; and a total of 144 days and 144 news items with and without photographs for the two newspapers used for this study.

Data Analysis

Data were analysed using descriptive statistics (frequencies and percentages).

RESULTS AND DISCUSSION

Frequency of stories with and without photographs

Information on frequency of stories with and without photographs (Table 1) indicates that 90.3% of agricultural stories were accompanied with photographs, while 9.7% did not have photographs. This implies that most of the news items covered in the study's time frame was accompanied by photographs. It can then be inferred that newspapers' editors recognize that photographs is a powerful tool to reinforce claims and contents of their stories; and will therefore strive to ensure that photographs are placed to further tell the stories. This is deliberate as photographs most often serve the purpose of holding readers' attention after glancing through the content of the story and preventing them from flipping to the next page almost immediately. This also makes the readers to understand the content of the story better and likely better able to recall such story.

Table 1
Frequency of stories with and without photographs

Newspapers item	Frequency	Percentage
With photographs	130	90.3
Without photographs	14	9.7
Total	**144**	**100.0**

Space allotted to the photographs

Analysis of space allotted to photographs in Table 2 shows that variations exist in space allotted to agricultural photographs in the selected newspapers. Guardian allotted the highest space of 7,902.75sqcm with a mean of 102.633sqcm while New Nigeria allotted the lesser space of 4,190.33sqcm with a mean of 58.199sqcm over the study's time frame. Guardian allotted a space of 6,094.34sqcm for agricultural produce and products while the space allotted to agricultural equipment was 820.58sqcm. New Nigeria allotted a total space of 1,092.72sqcm for agricultural equipment and lesser space of 2,143.52sqcm for agricultural produce and products. A cursory assessment of these statistics suggests that for the selected newspapers not to have used photographs to tell the stories beyond equipment and products, such photographs may have accompanied promotional advertorial of companies that produce the equipment and products. This reflects common trend in Nigeria's print media to only cover certain news areas only if such is paid for.

Table 2
Space allotted to the photographs

VariablesMean	Space allotted (sq.cm)	
Guardian	102.633	7902.75
New Nigeria	58.199	4190.33
Agricultural equipment (Guardian)	91.176	820.58
Agricultural produce and product (Guardian)	117.198	6094.34
Agricultural equipment (New Nigeria)	68.307	1092.92
Agricultural produce and product (New Nigeria)	53.654	2413.52

Representativeness of the photographs

Data in Table 3 on how representative the photographs are in telling the stories they accompanied reveals that barely more than one-third (37.5%) of the photographs were actually depicting the content of the story in the selected newspapers while 62.5% were at variance with the content of stories they were to portray. This is one of the underlining arguments that prompted this study. For enterprises like agriculture, this does not augur well for the intent and purposes photographs are to serve. For whatever reason, this is one trend that should be discouraged as according to Dickson (2004), the effectiveness of photographs should not be compromised when used to tell a story. Therefore, if pictures in newspapers are not representative, its effectiveness is in doubt. This agrees with the position of the National Art Education Association (2013) that further reiterates the significance of photographs being representative of the story it accompanies.

Table 3
Representativeness of the photographs

Representativeness	Frequency	Percentage
Representativeness	54	37.5
Non-representativeness	90	62.5

Prominence of agricultural photographs in the newspaper

Table 4 shows that agricultural photographs are not prominently placed in the Nigerian newspapers. They are mostly displayed on the non-prominent pages. Several studies (Olowu and Yahaya, 1993; Fawole and Olowu, 1997; Fawole and Olajide, 2012a; Fawole and Olajide 2012b; Olajide and Fawole, 2014) have reported non-strategic placement of agricultural related news items in Nigerian newspapers. It is a common knowledge that if stories are not placed in strategic locations in the newspapers, photographs accompany such stories cannot get a fair deal. It is the prerogatives of editor of the Newspapers for placement of stories and photographs in locations in the Newspapers.

Table 4
Prominence (placement) of agricultural photograph

Prominence	Frequency	Percentage
Other	144	100
Total	**144**	**100**

CONCLUSION AND RECOMMENDATION

It is concluded that most agricultural news items covered in the newspapers are accompanied by photographs; the Guardian allotted more space to photographs in general. Whereas the Guardian had more space for agricultural produce and products compared to New Nigeria, the New Nigeria had more space for agricultural equipment than the Guardian. However, most of the photographs are neither representative of pictures painted in the story lines nor placed in strategic locations in the Newspapers. It is recommended that editors should ensure that photographs for agricultural news items and related development areas like health, environments and climate change be representative of the content of the story lines as well as placed in strategic location as space allows in their newspapers.

REFERENCES

Ballenger H. B. (2014) *Photography: A Communication Tool*. Scholar Works Georgia State University 101p

Dickson, O. (2006). Effective use of pictures in Literacy Education. *A literature Review* No 2 pp 1-4

Ellis, M. (n.d.). The birth of modern photography Retrieved December 6, 2012 from http://www.netplaces.com/photography/

Fawole O.P and Olowu T.A. (1997). Coverage of women's Agricultural Activities in Nigeria Daily Newspapers. *Journal of Agricultural Extension* Vol.1, pp 41-50

Fawole O. P. and Olajide B. R. (2012a) Coverage of gender roles in agriculture in four Nigerian newspapers (2000-2004) *Journal of Media and Communication Studies* Vol. 4(2), pp. 30-34

Fawole O. P. and Olajide B. R. (2012b) Reporting of Climate Change News in Three Nigerian Newspapers *Journal of Agricultural Extension* Vol. 16 (1) pp 31-41

Igene B.O (1990). The use of photograph for information Reinforcement. Culture Resource Management. An African Dimension, Ibadan Wisdom Publishers, pp. 63-72

Lasén, A., & Gómez_Cruz, E. (2009). Digital photography and picture sharing: Redefining

the public-private divide. Knowledge, Technology & Policy, 22(3) 205--215.

Olajide B. R. and Fawole O. P (2014). Coverage and content analysis of biotechnology and genetically modified organisms in four selected Nigerian daily newspapers. *Tropical Agricultural Research and Extension* Vol. 16 (3) pp 80-86

Olowu, T.A. (1990). "Reportage of Agricultural News in Nigeria Newspapers" *Journalism Quarterly*Vol. 6, No. 1. Pp. 195-200

Olowu, T.A. and Yahaya, M.K *(1993)* Nigerian Journalists' attitude towards coverage of rural development news. *Nigerian Journal of Rural Extension and Development, (2 & 3) pp 39-48*

National Art Education Association (2013) The visual arts: So much more than you see. Retrieved November 3, 2013, from http://www.arteducators.org/advocacy