The Nigerian Journal of Rural Extension and Development

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Note to Contributors

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Information and Communication Technologies (ICT) and youth farmers empowerment in conflict de-escalation and transformation periods in Osun State Nigeria

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Abstract
Three months information communication technology's components utilization was organized for youth farmers during conflict de-escalation stage as an appropriate empowerment or conflict rehabilitation strategy. The quest for the extent to which utilization of ICT's components by youth farmers has rehabilitate or empowerment youth farmers in conflict-prone areas necessitates conduct of this research. The period of examination was dichotomized into Conflict De-Escalation Period (CDEP) and Conflict Transformation Period (CTP). A simple random sampling technique was used to select 250 farmers from the Village Extension Agent's (VEA) register. Data were collected using an interview schedule and analyzed using frequency count, percentages, and t-tests. Findings revealed that over 50.0% of the youth farmers did not have access to ICT components during conflict de-escalation periods, as against over 60.0% of the youth farmers who made use of ICT components during conflict transformation periods. Consequently, farmers recorded lower production of cocoa (40 tons), maize (10 tons) and cassava (22 tons) during CDEP as opposed to higher production of cocoa (525 tons), maize (62 tons), and cassava (1,210 tons) recorded during CTP. The majority (95.0%) of youth lived below the poverty line in CDEP, contrasting with 68.0% who lived above the poverty line in CTP. Less than 13.0% of the youth farmers made use of new ICT, while more than 50.0. % made use of interpersonal and traditional ICT. Crop production is statistically different in CDEP and CTP at $p < 0.05$. Hence, use of ICT and peaceful environment are essential to increase in crop production and poverty alleviation among youth farmers.
Keywords: Youth farmers, conflict, crops production, poverty, information.

INTRODUCTION

Youth is a group of young people in a society who have a lot of energetic new ideas, as well as constructive perception to facing life challenges. Worldwide, it is estimated that there were 1.2 billion youths in the year 2000 and 53% of them lived in the rural areas. In Nigeria, youth predominated in a population estimated to have been 140 million in 2006, 45% falling in the age bracket with a mean age of 17.6 years (United Nations System in Nigeria, 2001). In the rural areas, youths contributed significantly to agricultural production. Most of them engaged in planting tree (such as cocoa) or arable crops, marketing and selling of agricultural commodities, connection of farmers to relevant agricultural information sources (Bolarinwa, 2007).

Potentially, youth constitute a promising workforce for rural and agricultural development because they have characteristics which when nurtured and utilized are invaluable assets to sustainable agriculture. Such characteristics include: innovation, minimal risk aversion, faster reaction time, less fear of failure, less conservative, greater physical strength, greater propensity for knowledge acquisition with a faster rate of learning, better social engagement and more apt at relationship building (Adedoyin, 2005). In order to fully promote the potential of youth, there is the need to empower them. That is, they should be given the opportunity or ability to improve their situations economically, educationally, politically, socially, and physically. This can be achieved by exposing them to relevant information. With knowledge comes power. Hence, empowerment of rural youth farmers should be focused on ways to enhance their farm and non-farm productivity, thereby meeting their economic and social needs through efficient and sustainable management of their resources and control of their environment. The attainment of these goals depends not only on farmers' access to production resources, but also on their access to technical and up-to-date information regarding where to source and how to make use of such resources, and how to locate or create markets for the outputs of their economic enterprises. The adage, "knowledge is power" is by no means significant in the use of Information and Communication Technology (ICT) in Nigeria (Knitumoya, 1992).

Contrary to the previous situation, the benefits of ICTs are fully enjoyed when utilized harmoniously, in areas where conflict is constructively managed. In the conflict-ridden area of Osun state, conflicts between individuals and within communities were not constructively managed. Consequently, youths with high vigor from the majority population were exposed to the carrying of guns, destruction of property, and killing. Albert (2001) found that the majority of the youths invited to conflict resolution sessions organized by the United States Agency for International Development Office of Transition Initiatives Nigeria (USAID/OTI) were from militant groups in both Ife and Modakeke. Some of them even had bullet wounds on their bodies or bullets/pellets still lodged in some part of their bodies.

Youth were responsible for the bulk of the violent conflict because they were not afraid of being killed. Hence, conflict led to displacement of most (76.4%) of the youth farmers from agricultural areas, 62.0% had low crop production, and 72.0% disengaged from off-farm income generation in all, 73.4% lived below the poverty line (Bolarinwa, 2007).

ICT is an important means of achieving agricultural transformation because it provides local farming communities with scientific knowledge, thereby making farming interesting to the youth. It makes it possible for youth to have access to agricultural data, records, and information; as well as making transmission of information among individuals possible and less cumbersome even when thousands of miles apart. It provides information on the best farming methods which enable farmers to take appropriate measures to increase farm yield and fight against pest and crop or animal disease (e.g. bird flu) it also offers increased access to market information for farmers and traders. In developing countries ICT encompasses a comprehensive outlook of components that includes traditional ICTs (radio, cinema, television, video, and analog telephone) and new ICTs components such as computers, internet, and satellite connection Global Mobile Communication System (G.S.M).

In Nigeria today, both central and state governments have made ICT one of their development targets, thereby revolutionizing both governmental and non-governmental activities. Substantial use of (G.S.M) handsets by many Nigerians brought new business opportunities into the rural areas. Many individuals have now become dealers of handsets, recharge cards, or technicians who repair damaged handsets. Other rural dwellers have become computer operators or have even opened business centers. Hence, the use of ICT has created sources of employment that enable youth to obtain jobs and to earn salaries or wages. It enables youth to create their own wealth and thus, helps to eliminate unemployment, a leading cause of poverty and hunger among youths in Nigeria (Aluko, 2004). Based on this premise a course on utilization of ICT's components for agricultural development was organized for youth farmers in violent conflict areas with the aim of empowering the youth farmers and improve agricultural development in the area

In view of ICT potential to empower youth in areas that this research sets forth to examine these questions: how are youth farmers responding to ICT and have they been empowered by ICT? To resolve these questions, the research provided information on differences that ICT adoption has had on youth, information seeking patterns, agricultural production and their economic status now that they have employed a more constructive style of handling conflict.

METHODOLOGY

Osun state was divided into the four zones Oshogbo, Ife, Ijesha and Ejigbo based on agro-ecological criterion (OSADEP, 2006). Arokoyo (2005) classification of ICT components into traditional ICT (radio, television, prints, audio, video, and analog telephone), new ICT (computers, internet connections and Mobile phone) and inter-personal communication (village extension agents, friends and relatives) was adapted in the classification of ICT's components in this study. The zone with anecdotal accounts of conflict effects and those that witnessed incessant conflicts for more than a decade was purposively selected as the conflict-ridden area. The data collection period was dichotomized into conflict de-escalated periods and conflict transformation periods. De-escalating period is the period when the two communities stop fighting while conflict transformation period is the period when the two parties start looking for means of improving their livelihood and their environment. In other words it is the period of repairing what has been damaged during conflict. Sample framework was the farmers' register kept by the Osun State Agricultural Development Program's village extension agents. From the number of farmers in the village extension agent's register, 10-20% of the youth farmers were randomly selected for the ICT's components utilization training prior to the conduct of this research. In all two hundred and fifty youth farmers that participated in ICT utilization training were interviewed. Data were analyzed, and inferential statistics such as t-tests were used to establish difference in farmers' production levels, which is a function of empowerment.

RESULT AND DISCUSSION
Accessibility of Youth Farmers to ICT Components (Traditional, Interpersonal and New ICT)

Table 1 indicated that less than 50.0% of the youth farmers had access to information components during conflict de-escalation periods, compared to over 60.0% of the youth farmers who made use of ICT components during conflict transformation periods. Specifically, greater proportion (77.2%, 75.2% and 65.2%) had access to receive information from extension agents, radio and mobile phone respectively during conflict transformation period. It could be inferred from these findings that harmonious or peaceful situations are essential condition to farmers' access to relevant agricultural information components. In line with this finding, Ugwaegbu (1999) confirmed that in conflict situations, farmers are found diverting their time and energy to possession of weapons rather than pursing information that will promote their crop production enterprises.

It could also be inferred from the finding that farmers are yet to make use of new ICT. Most farmers continue to rely on traditional ICT components and

interpersonal information sources. Yau (2005) attributed constraints on the use or access of new ICT components in Africa to low computer literacy, inadequate technical skills, and the high costs of personal computers systems, internet connection service and payments for staying online, as well as the cost of recharge cards. Therefore, any program that promotes use of ICT components in Nigeria and Africa must focused on the provision of solutions to these constraints.

Table 1: Youth farmers access to ICT component in conflict de-escalated and transformation stages

ICT Categories	ICT Components	Conflict de-escalation stage			Conflict Transformation Stage		
		Often	Occasionally	Never	Often	Occasionally	Never
New	* Internet Connection	20(8.0)	30(12)	200(80.0)	80(32.0)	20(8.0)	150(60.0)
	G.S.M	60(24.0)	21(8.4)	169(67.6)	163(65.2)	25(10.0)	62(24.8)
Traditional	Radio	50(2.0)	22(8.8)	178(71.2)	80(32.0)	11(4.4)	159(63.6)
	Television	125(50.0)	10(4.0)	115(46.0)	188(75.2)	10(4.0)	62(20.8)
Inter-personal	Extension Agents	15(6.0)	40(16.0)	195(78.0)	193(77.2)	30(12.0)	27(10.8)
	Relatives	80(32.0)	20(8.0)	150(60.0)	122(48.8)	40(16.0)	98(35.2)

Figure in parentheses are in percentage
* Multiple responses.

Types of Information Sought by Farmers and Sources of Information

It was found that youth farmers often sought information on conflict related issues and agricultural development. Results in Table 2 indicated that 48.4% of youth farmers made use of new ICT to consult arm dealers and 46.0% used it to solicit help during conflict de-escalation periods. However, in conflict transformation periods, over 64.4% and 72.4% of farmers searched for improved seed information using old ICT components and interpersonal systems respectively as against 4.4%, sought for improved seed information using new ICT. It could be deduced from these findings that new ICT components are not yet common among farmers in Nigeria. The findings support Arokoyo (2005), who found that farmers in Nigeria still primarily depend on traditional and interpersonal information sources. The United Nations' Educational, Scientific, and Cultural Organization (UNESCO, 2003) found that traditional ICT and interpersonal sources of information are the mainstay for information outreach in many parts of developing countries because of the poorly developed state of infrastructural development in the areas. Hence, projects that will make new ICT infrastructural components available and affordable to youth farmers should be embarked upon by government and non-governmental agencies.

Table 2: Type of Information Farmers sought for and Sources of Information in Conflict De-escalation and Transformation Stages

Type of Information	De-escalation Stage			Transformation Stage		
	New	Old	Interpersonal	New	Old	Interpersonal
* Land Preparation	10(4.0)	22(8.8)	65(26.0	11(4.4)	145(58.0)	173(71.2)
Plant distance	-	11(4.4)	51(20.4	12(4.8)	161(64.4)	182(72.4)
Improve seeds	-	17(6.8)	42(16.8)	18(7.2)	172(68.8)	181(72.4)
Good quality livestock	-	-	35(14.0)	21(8.4)	135(54.0)	142(66.8)
Storage facilities	-	25(10.0)	36(14.4)	29(1.6)	119(47.6)	152(60.8)
Processing of agricultural commodities	-	11(44.0)	45(18.0)	42(76.8)	110(44.0)	175(70.0)
Chemical application	-	32(12.8)	55(22.0)	39(15.6)	126(50.4)	172(68.8)
Purchase of inputs	-	18(7.2)	46(18.9)	65(26.0)	155(62.9)	191(76.4)
Making contact with warriors	101(40.4)	30(12.0)	-	-	-	-
Contact with arm dealers	121(48.4)	-	-	-	-	-
Soliciting help from neighboring communities	115(46.0)	-	-	-	-	-
Marketing of Agric products	10(4.0)	15(6.0)	20(8.0)	40(16.0)	182(72.8)	160(72.0)

Figures in parentheses are in percentage
* Multiple responses

Effect of Using ICT on Farmers' Production Levels in Conflict De-escalated and Transformation Periods

Results in Table 3 revealed decrease in farmers' production levels of cocoa (40 tons), maize (10 tons), and cassava (22 tons) in conflict de-escalation period as opposed to higher production

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levels of cocoa (525 tons), maize (621 tons), and cassava (1210 tons) that were recorded during conflict transformation stage. Access of youth farmers to ICT components and the interest they have in seeking information using ICT components could be attributed to an increase in crop production during the conflict transformation period. An increase in farmers' crop production confirmed that adoption of ICT has had a tremendous impact on farmers' income generation activities which confirmed that youth farmers have been empowered.

Table 3: Crop Production Level in Conflict De-escalation and Transformation Stage in Tones

Crops	Conflict de-escalation stage	Conflict transformation stage
Cocoa	40	525
Maize	10	621
Cassava	22	1210

Farmers' income in de-escalated and transformation periods

As indicated in Table 4, in Nigeria farmers' average yearly income from the sale of crops revealed a lower sum of N12, 510.00 during conflict de-escalated period compared to the higher N89, 150.00 average incomes recorded for farmers during the conflict transformation stage. Increase in income of farmers could be traced to increase in production levels and farmers having access to relevant agricultural information using new ICT, traditional ICT, and interpersonal forms of communication.

Table 4: Farmers' average income level in conflict de-escalation and transformation

Period	Income level
De-escalation	₦12,510.00
Transformation	₦89,150.00

Farmers' poverty level in conflict de-escalated and transformation stages

It was found that 95% of the youth farmers lived below poverty line in conflict de-escalated stage compared to 68% of youth farmers in non-poor categories during a conflict transformation stage as referenced in Table 5. It could be inferred from the result that the uplifting of farmers from absolute poverty level during a conflict transformation stage could be attributed to a farmer's access and utilization of relevant agricultural information. Use of ICT not only empowered youth farmers but creates wealth. This finding confirmed the observation of Daudelin (2003) that the strongest predictor of conflict impact among farmers is poverty. It is so because poverty and over-dependence on subsistence agriculture is closely related. Hence, the promotion and accessibility of affordable new ICT components in the rural areas will go a long way toward reducing poverty among farmers.

Table 5: Distribution of youth by head count poverty level

Poverty Categories	Conflict de-escalated (%)	Conflict Transformation (%)
Core	65	10
Moderate	30	22
Non-poor	5	68

Hypothesis Tested

Test for difference in farmers' crop yield between de-escalated and transformational periods. Results from Table 6 revealed differences in farmers' crop yield levels between conflict de-escalated and conflict transformation periods. As indicated in the table 6, there is a significant difference between the farmers' yield in conflict de-escalated and conflict transformation periods for cocoa t=2.49, p=1.96 , cassava t=4.12, p=1.96. The difference is statically significant for cocoa p<0.05, and cassava p<0,05. This finding corroborated the mean yield index of farmers where they recorded higher crop yields in transformation periods and lower crop yields in conflict de-escalated periods. Hence, access to relevant agricultural information paves the way for higher crop yields and poverty alleviation of farmers in the area.

Table 6: T-test Analysis of Farmers Crops Yield in Conflict De-escalation and Transformation Stage

Crops	Period	Means	Means diff.	T-cal	P	Decision
Cocoa	Conflict de-escalation	525	485	2.49	1.96	S
	Conflict transformation	40				
Maize	Conflict de-escalation	10				
	Conflict transformation	621	611	3.10	1.96	S
Cassava	Conflict de-escalation	22	22			
	Conflict transformation	1210	1188	4.12	1.96	S

CONCLUSION

An attempt has been made in this paper to examine ICT utilization and its impact on the empowerment of youth farmers in conflict-ridden areas, with a view toward identifying possible policy strategies for improvement. The study found that life in conflict de-escalated period is characterized by low per capita income, inadequate access to information facilities, poor crop production, and high poverty levels. As indicated in the study, the impact of ICT utilization improves farmers' lives in conflict transformation periods. Therefore, suggested measures for improving the quality of life in any conflict-ridden area center on making new ICT available and accessible to youth farmers, generation of rural youth employment, making improved crops accessible and available to farmers, and integration of constructive conflict management training into village extension agent curriculum.

What is called for, however, is the adoption of a package of these measures rather than the use of only one of them. For instance, a policy instrument which is directed towards increasing agricultural production may not achieve the desired result if it is not accompanied by farmers' access to improved agricultural information via appropriate channels and the ability of farmers to manage conflict constructively. Without constructive conflict resolution, zero production will be recorded even when all other factors favor production. Mbarika (2005) stated that in developing countries, the digital divide policies and program typically utilize ICT to advance modernization, promote social and economic development, and improve the status of men. Therefore, if these suggestions are effectively administered and executed, it will go a long way towards improving the poor quality of life for conflict victims, promote social and economic development, and raise the status of farmers in Nigeria.

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Effects of social capital on food security of farming households in Ogun state, Nigeria

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Abstract

This study examined the effects of social capital on household food security among farmers in Odeda LGA of Ogun state, Nigeria. A multistage sampling technique was used to obtain data from 116 farming households in the study area in 2010. Data analysis was done using descriptive statistics and Probit model. The food security line was ₦ 2,155.74 per month per adult equivalent. Based on this, 45% of the total sampled households were food secure while 55% were food insecure. Food secure households exceeded the calorie requirements by average of 19% while food insecure households fell short of calorie requirements by average of 28%. A unit increase in social capital ($p<0.01$) increases the probability of household to be food secure by 0.0991 while a unit increase in household size ($p<0.01$) and level of education of household head ($p<0.01$) decreases the probability of household to be food secure by 0.4095 and 0.1367 respectively. Participation in a socio- economic group is motivated by perceived benefits such as access to material incentives and capacity building opportunities available to members as well as mutual trust among members. Dimensions of cognitive social capital found among respondents revealed that most households (89.7%) had people to assist with childcare in emergencies and 96.6% had at least one close friend who could be relied on in cases of emergency. Consistent with apriori expectation, social capital contributes to household food security. Social capital was truly exogenous to household food security with no reverse causality.

Keywords: Social Capital, Food Security, Farming Households.

INTRODUCTION

Meeting the food needs of families in sub-Saharan Africa is a serious challenge. Several factors have combined to restrict access to food for many in developing countries and hunger in sub-Saharan Africa is as persistent as it is widespread (FAO, 2006). Of the estimated 923 million undernourished people in the world, about 200 million of them are in Sub-Saharan Africa (FAO, 2009). In Nigeria, an estimated 8 percent of the 140 million population was estimated to be undernourished in the 2004-2006 period (FAO, 2009) and less than 5 years to the target year; available statistics still cast doubt on whether the MDG of eradicating extreme hunger and poverty could be achieved by 2015. Adequate food intake (quantity and quality) is a key for healthy and productive life and the importance of food is shown in the fact that it accounts for a substantial part of a typical Nigerian household budget. The basic minimum level of nutrient requirement has been determined by the World Health Organization (WHO) and the Food and Agricultural Organization (FAO) to be 65 grammes of protein and 2450 kcal of energy per capita intake, of which if consumed otherwise, results in a state of malnutrition.

Although 70 percent of Nigerians live in rural areas, there is a dearth of national surveys providing datasets for the analysis of food and nutrition security in rural Nigeria. Though there have been a number of individual and institutional efforts and attempts at generating databases on food and nutrition security for Nigeria, these efforts are hampered by inadequate funds to implement large-scale surveys. Many of the datasets for food and nutrition security are not disaggregated to the household level, which constrains the full analysis of the situation, thus creating a gap in any analysis of the household and individual levels. This gap needs to be filled to make progress in improving the food and nutrition security situation of rural dwellers in Nigeria.

There is growing empirical evidence that social capital contributes significantly to sustainable development and welfare. Growing opportunity requires an expanding stock of capital. The traditional composition of natural capital, physical or produced capital, and human capital needs to be broadened to include social capital. Social capital is widely seen as a resource that facilitates cooperation within or between groups of people. It can emerge in relationships in many areas of life, such as those involving friends and families, school communities, ethnic, religious and community groups, occupational groupings, firms, governments and other institutions. According to Narayan and Pritchett (1997), social capital is pervasive and can generate benefits in a subtle range as well as more visible ways. Following from this, is the need to complement acquisition of human capital and establishment of physical infrastructure with social capital. Social capital has the power to mitigate shocks to income and food supplies in times of crises. Generally, the severity of the shock to income and food supplies and what coping strategies families may choose to utilize to cope with the shock may depend primarily on the strength of the social networks they have access to.

Food security at the household level is ultimately a balance between availability and access, and in this regard complementary food security policies that increase the probability of food access by the vulnerable groups (in this case of rural households) are necessary. Although economic development is the long-term solution to Africa's challenge on hunger and poverty, this will take time. It follows therefore that African nations have to pursue policies and strategies that promote long-

term growth while at the same time offering short-term safety nets for the poorest of the poor. Since the majority of Nigerians (70 percent) live in rural areas, an analysis of the food and nutrition security situation of rural dwellers provides a clear picture of what needs to be done to address immediate needs and to build a stronger food system that can respond to future challenges. One factor that has been found to have the potential to mitigate food insecurity in many developing country settings is social capital. In times of financial hardship, food shortages, unreliable rainfall or severe illnesses, various studies in Africa have shown that the social capital that people have access to make a big difference in their abilities to surmount these adverse events (Mtika, 2001; Muga and Onyango-Ouma, 2009). Numerous studies have shown associations between social capital and positive health outcomes (Kawachi *et al*, 1998) and decreased crime rates (Sampson *et al*, 1997): but very few to our knowledge have examined potential relationships between social capital and food security especially in Nigeria.

Consequently, this study empirically determined the effects of social capital on food security status at the household level using farming households in Odeda LGA, Abeokuta and contributed to the growing literature on social capital and welfare, providing an indication of what policy recommendation is necessary to improve the standard of living of Nigerians. Arising from the forgoing, pertinent questions answered in this study included: What is the food security status of farming households in the study area i.e. are the farming households' food secure? What is the extent/depth of food security among the respondent households? What are the prevailing social networks in the area and what is the relationship between social capital and food security status of the households?

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Intuitively, the basic idea of "social capital" is that one's family, friends, and associates constitute an important asset, one that can be called upon in a crisis, enjoyed for its own sake, and/or leveraged for material gain. Social capital is an important collective resource people draw on in pursuit of well-being. Conversely, the absence of social ties can have an equally important impact. Communities endowed with a diverse stock of social networks and civic associations will be in a stronger position to confront poverty and vulnerability (Moser, 1996; Narayan, 1997), resolve disputes (Varshney 1999), and/or take advantage of new opportunities (Isham *et al*, 2002). The level of participation and involvement within a group signifies the investment being made by individuals, an investment into themselves and their community.

Kawachi *et al* (1999) argued that social capital can increase the likelihood of access to

various forms of social support during times of need. At the household level, households that know and trust their neighbors may be more likely to request for food, or reciprocate with childcare responsibilities. These seemingly trivial favours could conceivably make a large difference in terms of access to food, especially for low-income households. Households may have similarly limited financial or food resources, but households with higher levels of social capital are less likely to experience hunger.

Scholars identified three kinds of social capital: bonding, bridging, and linking. Bonding social capital refers to relationships among members of a group or network who see themselves as relatively equal, for example, immediate family, close friends and neighbors or schoolmates. Bridging social capital refers to relationships among people and groups of people who are fundamentally different such as age, socio-economic status, race/ethnicity, or education. Linking social capital represents the extent to which individuals build relationships with the institutions and people who have relative power over them (e.g., to provide access to services or jobs) thus enabling them to leverage a far wider range of resources than was previously available to them (Woolclock, 2001).

METHODOLOGY

The study was carried out in Odeda LGA, Ogun State and data for the study were collected in 2010. Respondents were selected using multistage sampling technique. Six villages (two from each of the three sub zones of the study area -Odeda, Ilugun and Opeji) were chosen from which 116 farming households were selected randomly.

Descriptive Statistics: Descriptive tools such as frequency counts, mean and standard deviations, and percentages were used to analyze food security status by socio-economic variables of respondents. In addition, food security and surplus indices were constructed.

Food Security Index: The food security index was computed using the Cost of Calorie function (proposed by Greer and Thorbecke, 1986) based on the food security line and recommended daily calorie requirement. This method was used because of its simplicity. According to the FAO's recommended daily requirement (FAO, 2007), households whose daily per capita calorie intake was up to 2450 kcal were regarded as food secure while those below 2450 kcal were regarded as food insecure households. The following equations provide an explanation towards estimation of the index:

$$Ln\ X = a+bC \dots\dots\dots\dots\dots (i)$$

Where

X = Food Expenditure (₦)

C = Calorie Consumption (kcal)

$$Z = e^{(a+bL)} \dots\dots\dots\dots\dots (ii)$$

Where

Z = Cost of minimum recommended energy level (₦); Food security line for the study area

L = Recommended daily energy level (2450 kcal)

a = Intercept

b = Coefficient of Calorie Consumption

e = A mathematical constant (2.71828)

A household whose average cost of daily calorie consumption is equal to or more than Z is said to be food secure while any household with average cost of daily calorie consumption is lower than Z is said to be food insecure.

Surplus/Shortfall Index: The Index is given as:

$$P = \frac{1}{N} \sum_{J=1}^{m} G_j \ \text{.........…......….(iii)}$$

$$G_j = (X_j - L)/L \ \text{............….………(iv)}$$

Where

P = Surplus/Shortfall Index;

L = Recommended daily per capita requirements (2450Kcal.);

G_j = Calorie deficiency faced by household$_j$;

X_j = Per capita food consumption available to household$_j$;

N = Number of households that are food secure (for Surplus index) or food insecure (for Shortfall index).

This index measured the extent to which households were food secure or insecure.

Social Capital Variables: The aggregate social capital index was obtained via a multiplicative index of the three social capital dimensions (density of association, heterogeneity and participation in decision making) and normalized to a maximum value of 100 (Grootaert 1999).

Density of Membership: is captured by summing up the membership of associations by individuals in the household.

Meeting Attendance Index: is obtained by summing up the attendance of household members at meetings and relating it to the number of scheduled meetings by the associations they belong to. This value is then multiplied by 100.

Cash Contribution: is obtained by adding up the total cash contributed to the various associations the household belong to.

Labor Contribution: is the number of days that household members belonging to associations claimed to have worked for their associations.

Decision Making Index: is obtained by summation of the subjective responses of households on their rating in the participation in the decision making of the three most important institutions to them. The response is averaged across the three groups and multiplied by 100 for the household.

Heterogeneity Index: is an aggregation of responses of each household to questions on the diversity of members of the three most important institutions to the household. Questions are answered on whether members live in the same neighborhood, are same kin group, same occupation, same religion, same gender, same age group and same occupation. For each of the factors, a yes response was coded 0 and a no response was coded 1 and a maximum score of 11 for each association represents the highest level of heterogeneity.

Probit Model: Probit model constrains the estimated probabilities to be between 0 and 1 and relaxes the constraint that the effect of the independent variable is constant across different predicted values of the dependent variable. This is normally experienced with the Linear Probability Model (LPM) (Sebopetji and Belete, 2009). The probit model assumes that while we only observe the values of 0 and 1 for the variable Y, there is a latent, unobserved continuous variable Y* that determines the value of Y. The other advantages of the probit model include believable error term distribution as well as realistic probabilities (Nagler, 1994). We assume that Y* can be specified as follows:

$$Y^* = X'\beta + \varepsilon, \ \text{…………（v)}$$

where $\varepsilon \sim N(0, 1)$. Then *Y* can be viewed as an indicator for whether this latent variable is positive:

$$Y = 1_{\{Y^* > 0\}} = \begin{cases} 1 \ if \ Y^* > 0 \ i.e. -\varepsilon < X'\beta, \\ 0 \qquad otherwise. \end{cases}$$

$$\text{…….….(vi)}$$

Where

Y = Vector of dependent variable (1 for food secure households; 0 for food insecure households);

X = Vector of explanatory variables;

β = Probit coefficients;

μ_i = Random error

The explanatory variables included in the model are:

X_1 = Household size (number);

X_2 = Age of household head (years)

X_3 = Gender

X_4 = Education Level

X_5 = Years of Farming Experience

X_6 = Income (₦)

X_7 = Marital Status

X_8 = Aggregate Social Capital Index

RESULTS AND DISCUSSION

Socioeconomic characteristics:

Findings show that majority of the household heads were still within the active working age. An average farming household head in Odeda is 51.13 years and most of the respondents are between 41 – 50 years. The level of educational attainment shows that the respondents have on the average 5.1 years of formal education (primary) which is less than the nine years of basic education under the Universal Basic Education Program in Nigeria. Average household size stands at seven and there are households with as many as 16 members in the area. Household size is an important determinant

of the household's expenditure on food and large household size could be a threat to food security. In terms of family composition, there were more male headed households than female headed households in the study area. Income wise, households earn about ₦20, 306 per month from farming while those with secondary occupations earn about ₦6099 monthly from various secondary occupations.

Dimensions of Social Capital in Odeda: Table 1 presents the social capital dimensions of the sampled households. In terms of meeting attendance, results show an average of 72.61%

attendance by respondents and households contribute on the average ₦16,613.79 (± ₦2.32) yearly as cash contribution to their respective associations. Participation in decision making shows good level of activity with a 73.56 % participation index on the average. The heterogeneity level indicates low level (47.39 %) of diversity of membership of associations. The result of the study shows that 9 out of every 10 respondents (93.10%) are members of at least one local level institution.

Table 1: Household activity in associations

Social Capital Dimensions	Minimum	Maximum	Mean	Standard Deviation
Meeting Attendance (%)	0.00	100.00	72.61	30.04
Heterogeneity Index (%)	0.00	84.85	47.39	23.94
Participation in Decision Making (%)	0.00	100.00	73.56	61.78
Cash Contribution Index (₦)	0.00	121,200.00	16,613.79	22811.64
Labor Contribution Index	0.00	76.00	3.57	9.81

Depth of Food Security among the Respondents: Based on the recommended daily energy levels of 2450Kilocalories (FAO, 2007), the food security line for farming households in the study area was estimated at ₦ 69.54 per day per person (equivalent to ₦ 2,155.74 per month per person and ₦ 25,034.4 per person annually). Results showed that that only 45% of the sampled households were able to meet the recommended

daily per capita calorie requirement of 2450Kilocalories (Table 2). About 55% of the households were food insecure, subsisting on less than the recommended daily per capita calorie requirement of 2450Kilocalories. The Surplus Index (P) shows that the food secure households exceeded the calorie requirements by 19%, while the Shortfall Index shows that the food insecure households fell short of the recommended calorie intake by 28%.

Table 2: Food Security Indices

Variables	Value
Cost of Calorie equation	$\ln X = a + bC$
Constant	4.239
Slope coefficient	1.2×10^{-6}
Recommended daily Energy levels	2450Kcal
Food Security line Z: Cost of minimum energy requirements per	
Adult Equivalent	₦ 69.54 per day
	₦ 2,155.74 per month
	₦ 25,034.4 per year
Head count ratio (H)	0.55 (for food insecure households)
	0.45 (for food secure households)
Percentage households:	
Food secure households	45%
Food insecure households	55%
Surplus Index	0.19
Shortfall Index	0.28

Distribution of Food Security Status by Socioeconomic Characteristics: Results show that the food security of households decreases progressively with increase in the household head's age (Table 3). This result is in line with studies by Babatunde *et al* (2007) who found out that the older the household head, the lower the probability that the household would be food secure. Meanwhile, (83%) of the households with the household head of less than thirty years of age were food secure. This is probably because most household heads at this

age have a small household size; hence the few members of household have access to enough food. It was also observed that 43.4% of the male headed households were food secure while 52.9% of the female headed households were food secure showing a higher proportion of food secure households among female headed households than male headed households. This is in line with earlier studies on the gender component to food security, studies shows that fathers and mothers spend resources differently, and children are more likely to

be insecure when the father controls the resources needed for purchasing food (Muga and Onyango-Ouma, 2009). The Table also shows that food security incidence decreases with increase in household size, age of household head and increases as household income, social capital increase. The result agrees with Babatunde *et al.* (2007), who found that as household size increases, the probability of food security decreases most likely because large household size implies more people to feed by almost the same resources and all things being equal, higher income increases household access to food

Table 3: **Distribution of food security status by socio-economic characteristics of respondents**

Variables	Variables	Percentage of food secure households	Percentage of food insecure households
Age of household head (years)	≤ 30	5(83.3)	1(16.7)
	31-40	10(55.6)	8(44.4)
	41-50	20(51.3)	19(48.7)
	51-60	13(46.4)	15(53.6)
	>60	4(16.0)	21(84.0)
Gender of household Head	Male	9(43.4)	56(56.6)
	Female	43(52.9)	8(47.1)
Household size	1-4	12(75.0)	4(25.0)
	4-8	35(50.0)	35(50.0)
	9-12	4(14.8)	23(85.2)
	13-16	1(33.3)	2(66.7)
Monthly income of Household head (₦)	≤ 10,000	5(25)	15(75.0)
	10,001-20,000	31(49.2)	32(50.8)
	20001-30,000	9(34.6)	17(65.4)
	30,001-40,000	1(100)	0(0.0)
	40,001-50,000	3(100)	0(0.0)
	50,001-60,000	0(0.0)	0(0.0)
	60,001-70,000	1(100)	0(0.0)
	>70,000	2(100)	0(0.0)
Educational level of household head	No formal	17(41.5)	24(58.5)
	Primary	26(48.1)	28(51.9)
	Secondary	7(36.8)	12(63.2)
	Tertiary	2(100)	0 (0.0)

Figures in parenthesis are percentages

Probit Model: Table 4a presents the effect of social capital dimensions on household food security status. Additive social capital indices were used to determine the effect of social capital on household food security. Primary exogenous variables such as age, education, income of household head, and household size were statistically significant. Results also show that inclusion of the six social capital indices improved the performance of the model. This is observed with increase in the pseudoR^2. This new model has a better explanatory power as reflected in the pseudo R^2 of 0.3014.

Table 4a: Probit result of effects of social capital on food security

Variables	Basic Model	With Additive Social Capital Variables
Age of Household Head	-0.0574 (0.69)	-0.0817 (0.90)
Squared Age	0.0002 (0.28)	0.0004 (0.50)
Sex of Household Head	0.4629 (1.02)	0.5272 (1.06)
Education	-0.0925 (2.63)***	-0.1387 (2.90)***
Marital Status	0.4800 (0.60)	-0.0424 (0.04)
Household size	-0.2131 (3.67)***	-0.2147 (3.34)***
Farming Experience	-0.0148 (1.00)	-0.0156 (1.01)
Income	0.0000 (2.79)***	0.0045 (2.81)***
Heterogeneity Index	-	-0.0081 (0.93)
Meeting Attendance	-	0.0005 (0.08)
Cash Contribution	-	0.0045 (1.90)**
Labor Contribution	-	0.0035 (0.19)
Decision Making Index	-	-0.0020 (0.71)
Membership Index	-	0.0433 (0.69)
Number of Observation	116	116
Pseudo R^2	0.2675	0.3029
Log likelihood	58.4420	55.6151
Constant	2.6368	4.1204

Figures in parenthesis are t values

*** significant at 1%, ** significant at 5%, * significant at 10%

Disaggregation of social capital into its components showed that household cash contribution was significant at 5 percent level and positively related to household food security. Thus a unit change in household cash contribution will increase household's probability to be food secure by 0.0045.

Endogeneity Effects of Social Capital on Household Food Security: This study tested for the existence of causality effect with the aid of an instrumental variable. The choice of the model was to remove the possible endogeneity effects of social capital indices as noted in several similar studies like Olayemi (1998), Okunmadewa *et al* (2007), Yusuf (2008), among others. Social capital was therefore instrumented for using trust. The result is presented in table 4b below. Evident in the table is the improvement in the coefficient of the aggregate

social capital index with the use of trust. Further, the instrumental variable method leads to a higher coefficient (0.0442) for the social capital index when social capital was not instrumented for. Also, the coefficient is statistically significant with the use of the instrumental variable thus, we infer the absence of significant reverse causality and the exogeneity of social capital is therefore inferred. A unit increase in the level social capital leads to a 4.4 percent increase in food security. This result is in line with Narayan and Pritchett (1997), Grootaert (1999), Okunmadewa et al (2007), Yusuf (2008) and Aker (2005). The result of the equation with instrumental variable shows that exogenous variables such as age, age square, education, marital status, household size and social capital are statistically significant in determining the food security status of the farming households.

Table 4b: Result of the Instrumental Variable (2SLS) estimation of effects of social Capital on food security.

Variables	Without Instrumental Variable	Marginal Effect	With Instrumental Variable	Marginal Effect
Age	-0.0453 (0.53)	-0.0735	-0.1324 (2.00) **	0.0544
Age Square	0.0000 (0.11)	0.0001	0.0012 (1.84) *	-0.0009
Sex	0.5257 (1.14)	0.9349	-0.2382 (0.61)	0.4654
Level of Education	-0.0854 (2.35) ***	-0.146 4	-0.1064 (3.71) ***	-0.1367
Marital Status	0.6597 (0.79)	1.2929	-1.1964 (1.72) *	1.0271
Household size	-0.2026 (3.411) ***	-0.3482	-0.1628 (3.01) ***	-0.4095
Farming Experience	-0.0134 (0.90)	-0.0213	-0.0155 (1.33)	-0.0346
Income	0.0012 (2.84) ***	0.0034	0.0045 (1.07)	0.0023
Social Capital Index	-0.0056 (0.75)	-0.0124	0.0442 (5.98) ***	0.0991
Sample size	116		116	
pseudo R^2	0.2710		-	
Log Likelihood	58.1608		-556.3519	
Wald Chi^2	-		98.13	
Constant	2.2643		4.3288	

Figures in parenthesis are t values, *** significant at 1%, ** significant at 5%, * significant at 10%

Household size: Household size was a significant determinant of food security of respondent households with a marginal value of 0.35. This means that a one percent increase in household size will reduce the probability of household to be food secure by 35 %. This result is expected because increase in the household size implies that more people are eating from the same resources, hence, the household members may have less food to go round when compared with a smaller household size. The result is in line with the findings of Olayemi (1998).

Level of Education of household head: According to studies by Agbola, (2004) and Babatunde *et al* (2007), level of education of the household heads has significant effect on the probability of households to be food secure. Findings revealed that the level of education of household heads was a significant and negative determinant of households' food security status. A unit increase in the level of education of household head will reduce the probability of household to be food secure by 0.15. This suggests that a household with a well-educated household head may not necessarily be food secure.

Income: Results show that income of household heads is a significant and positive determinant of households' food security status. A unit increase in the level of income of household head will increase the probability of household to be food secure by 0.0000864. This result is in line with studies by Babatunde *et al* (2007) who found out that the higher the household head's income, the higher the probability that the household would be food secure. This was as expected because all things being equal, higher income increases households' economic access to food.

Social Capital: Findings also confirm that social capital is significant and positively associated with household food security status at 10 percent level with a marginal value of 0.0991 hence, a percentage increase in trust level of respondents will increase the household's probability to be food secure by 9.9 %. Households with higher levels of social capital are less likely to experience hunger. This is in line with other studies (Yusuf 2008; Okunmadewa *et al* 2005; Kawachi *et al* 1999, Rose 2000; Mtika, 2001; Muga & Onyango-Ouma, 2009) that discovered that social capital has positive influence on welfare and is an important factor in improving the quality of life of households.

Age of household head: A unit increase in the age of household head will reduce the probability of household to be food secure by 5.4%. This could be attributed to the fact that the productivity of old household head will decline as they are ageing thereby impacting on their food security status. This result is in consonance with Agbola (2004) who claimed that increase in age decreases food security.

Marital Status: Marital status is significantly and negatively related to food security. This is most likely because married respondents have larger household sizes than single or unmarried respondents.

CONCLUSION

The study shows that 45% of the sampled households in the study area were food secure while 55% of the households were food insecure. Factors that influence food security among the farming households are household size, age, education of household head, income and social capital. Social capital is significantly and positively related to household food security status. The test for reverse causality between social capital and household food security with the aid of instrumental variable estimation technique indicates a direct effect of social capital on food security. This implies the absence of significant reverse causality. The exogeneity of social capital is thus inferred. The study thus concludes that overall, social capital improves food security of farming households and is an important factor in improving the quality of life of households.

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Determinants of use of recommended food grains storage technologies or sustainable food security programme in urban southwest Nigeria

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Abstract
The study was conducted to analyse determinants of use of modern food grains storage technologies, and identify grain storage related problems in urban Southwest Nigeria so as to sustain food security programme. A pre-data survey was carried out to enumerate recommended grain storage technologies in the study area. Descriptive units of data were normalized to standard Z-scores, and data analysed with descriptive and inferential statistics. Modern and improved grain storage technologies in use were: improved cribs (7.22%), stores and warehouses (16.66%) drum and hermetic containers (15.55%) polythene-lined bags (10.55%) silos (1.11%). Indigenous technologies were local crib (6.66), ceiling top under roof (0.55%), sacks (37.77%) bowls (3.88%). Progressive Z-scores from 0-3 for favourable statements showed that technology attributes and communication factors were favourable determinants of use of modern grain storage technologies. While situational factors and perceived disincentives had few favourable determinants, perceived incentives had none. At $p<0.05$, gender ($X^2=7.04$) was significantly related to use of modern food grains storage technologies while educational status ($X^2=5.5$) was not. Correlation analyses showed significant relationships between age ($r = 0.91$), quantity of grains stored ($r = 0.98$) and use of modern grain storage technologies. There is significant difference among farmers', traders' and housewives' levels of use of recommended technologies ($W = 2213.4$, $X^2 = 19920.6$). Use of various communication channels in parallel, linking research and recipients and commercial warehousing are recommended.
Keywords: Determinants, Use, Grain technology, Storage.

INTRODUCTION

Nigerian Food Security Programme is centred on three-tier grain storage programme; Strategic Grain Reserve, Buffer Stock and On-Farm Storage Programme (Talabi 1998). The On-Farm storage programme is for small scale farmers to adopt technologically improved small scale storage structures and store 85% of the total grains required for food security. The deficit is to be complemented by activities of grain merchants and households (Olumeko 1998). Some factors are accountable for households not meeting its food security needs. National Agricultural Marketing Council (2002) discovered that income is the most single important determinant of a household ability to meet its food security needs. Some authors have pointed out more food insecurity in rural areas than in urban areas. Rose and Charlton (2002) opined that food insecure households were more likely to live in rural areas.

The Southwest zone of Nigeria lies between latitudes 6^0 and 9^0 north of Equator and longitudes 2^0 and 6^0 east of the Greenwich Meridian. Some grains are produced two times in a year in the zone and as such food security is supposed to be guaranteed in urban households. However, some authors have pointed out ineffective post-harvest handling systems in the zone (Salunkhe, Kadam and Chavan 1985; FAO 1989; FAO 1990). All these do not guarantee good storage of grains, hence a threat to sustainability of food security programme. Hindmarsh and Trotter (1990) pointed out that cost reduction in grain storage has been achieved mainly by tackling specific physical and biological problems causing losses of quality and quantity,

whereas more fundamental problems arise. The objective of this study is to analyse the use of recommended food grains storage technologies and assess its determinants for sustainability of urban food security programme in Southwest Nigeria. In doing this, the following specific objectives were addressed.

a. Enumerate recommended food grains storage technologies.
b. Determine the levels of use of recommended and indigenous food grains storage technologies.
c. Assess the determinants of use of recommended food grains storage technologies.
d. Investigate grain storage related problems.

METHODOLOGY

Agricultural institutions and research centres involved in post-harvest research in the zone were surveyed for recommended grain storage technologies. These organizations were:
- Nigerian Stored Products. Research Institute (NSPRI), Ibadan:
  i. International Institute for Tropical Agriculture (IITA), Ibadan;
  ii. Institute for Agricultural Research and Training (IAR&T), Ibadan;
  iii. Crop Storage Unit (CSU) of Federal Ministry of Agriculture, Ibadan;
  iv. Department of Agricultural Engineering, University of Ibadan;

v.   Department of Agricultural Engineering, Obafemi Awolowo University, lle-Ife;

vi. Post-harvest Centre of Federal University of Technology, Akure;

Thereafter a purposive sampling of Oyo, Ondo and Ogun States was done based on geographical location as regards grains production and handling. Then a multi-stage sampling of respondents was carried out.

Half of agricultural zones were purposively sampled from each State of study. In each zone two urban communities with population of more than 5,000 people were purposively sampled based on ADPs' recommendations of grain productions and handling in each case. Ondo State with only two agricultural zones had 4 urban communities sampled from one agricultural zone. Purposive random sampling of 5 farmers, 5 traders and 5 housewives was done in each of 4 urban communities in each State. A total of 180 respondents were interviewed for the study. In Oyo State, Ibadan, Shaki, Igbetti and Iddo were sampled whereas in Ogun State, Iperu, Obafemi-Owode, Abeokuta and Odeda were sampled. Urban communities sampled in Ondo State were, Akure, Owo, Oke-Agbe and Ikare.

Descriptive units in Likert type scale of very high, high, average, low and very low were converted to normalize standard scores to identify favourable determinants. Proportions of each descriptive unit were converted to cumulative proportion and cumulative proportion at mid-point calculated. The sigma score of each cumulative proportion at mid-point was found from the Table of normal deviates z corresponding to proportions p of a dichotomized unit normal distribution. The lowest sigma (z) score was added to sigma score of all descriptive units. These scores were then rounded up to the nearest figure.

Determinants were categorized into situational factors, communication factors, technology attributes, perceived incentives and perceived disincentives.

Determinants with z – rounded progressively from 0 to 2 and up to 3 were adjudged favourable. Hypotheses were tested with Chi-square, Pearson Product Moment Correlation and Coefficient of Concordance.

RESULTS AND DISCUSSION

Ages of respondents in relation to grains storage from Table 1 follows the normal distribution pattern. Many respondents do not store grains in the early parts of their life. The necessity to store grains occurs in the later part of life before it declines at old age. Importance of grain storage to meet social demands is very high with respondents between the ages of 31 to 60 years. Grains are used for consumption, for seed, for feed and for payment of wages in kind (FAO 1979). More than half of the respondents (55%) were female, mostly housewives, while the rest were male most of who were traders. Nwaubani et al (2007) discovered no significant relationship between gender and adoption of modern food storage technologies in rural communities of Edo State Nigeria, signifying that gender is not crucial in rural grain storage since most post-harvest activities are carried out by women. Less than one-fifth of the respondents (17.8%) had no formal education while more than one quarter (29.8%) had tertiary education. The rest (30.0% and 27.8%) had primary and secondary education respectively. This revealed the level of education in urban South-west Nigeria. Some authors have highlighted the importance of proper education in the use of improved farm practices (Ochu 2000, Alfred 2000). Quantity of grains stored revealed the subsistence level of grain holdings in urban Southwest Nigeria. More than three-quarter of the respondents (76.7%) stored between 1 to 20kg of grains while one-tenth (10.6%) stored between 21-40kg bags. Higher quantities of between 81-100, and over 100kg bags were stored by very few respondents respectively (3.3%). Salunkhe et al 1985 contended that commercial storage is usually done at large scale level. This can be bulk storage by government agencies which have adequate economic and technical support or by agro-industrialists as well as big time farmers. There is need for aggressive extension work in the study area to sustain the food security needs.

Table 1: Socio-economic Characteristics of Respondents

Variables	Frequency	Percentage
Age (Years)		
20-30	13	7.2
31-40	44	24.4
41-50	65	36.1
51-60	40	22.2
61-70	16	8.9
71-80	2	1.1
Gender		
Male	81	45
Female	99	55

Variables	Frequency	Percentage
Educational Status		
No for Education	32	17.8
Primary Education	44	24.4
Secondary Education	54	30.0
Tertiary Education	50	27.8
Quantity of Grains Stored in 100kg bags		
1-20	138	76.7
21-40	19	10.6
41-60	10	5.6
61-80	1	0.6
81-100	6	3.3
>100	6	3.3

Recommended Food Grains Storage Technologies

Many institutions in South-West Nigeria have developed grain storage technologies at domestic, farm and commercial levels. Nigerian Stored Products Research Institute (NSPRI) recommended that for effective storage, wholesome grains should be sorted out from infected/infested and damaged ones. It must be kept at safe moisture level ranging from 9-15% depending on the type of grain, treated and stored in recommended storage structure. It then produced structures like oil-drums with tight-fitting caps, plastic containers and polythene-lined sacks for domestic storage. Improved cribs have been developed for farm level storage, while stores and warehouses and inert atmosphere silos are recommended for commercial level storage of grains. The Crop Storage Unit (CSU) developed modified oil drum for household use coupled with galvanized iron sheet of different capacities; 1 metric tonne, 600kg, 400kg, 300kg and 150kg respectively. For farm level storage 2 metric tonne and 5 metric tonne indoor structures as well as 10 metric tonne reinforce concrete cement were developed. International Institute for Tropical Agriculture (IITA) adapted the ventilated crib while Centre for Post Harvest Studies Obafemi Awolowo University developed a laterite concrete silo which was still at its pilot stage. Food Storage Research Laboratory, Federal University of Technology, Akure developed a wooden silo which is only for training and demonstration purposes.

Use of Indigenous and Recommended Food Grains Storage Technologies.

Levels of use of recommended grain storage technologies were observed to be nearly even among farmers, traders and housewives (Table 2).

Table 2: Levels of Use of Recommended Storage Technologies

Recommended Technology	Farmers Frequency %		Traders Frequency %		Housewives Frequency %		Total Frequency %	
Sorting of Grains	57	(31.7)	54	(30.0)	59	(32.8)	170	(94.4)
Determination of moisture content	59	(32.8)	59	(32.8)	60	(33.3)	178	(98.9)
Pre-Storage Treatment	52	(28.9)	34	(18.9)	42	(23.3)	128	(71.1)
Storage in modern structure	32	(17.8)	26	(14.4)	34	(18.9)	92	(51.1)

Use of various levels of recommended storage technologies for effective grain storage recorded high score among sorting of grains (94.4%), determination of moisture content (98.9%) and pre-storage treatment of grains (71.1%). However, the most important level of recommendation, storage in modern structure, recorded the lowest score with just half of the respondents (51.1%) using modern grain storage structure in urban Southwest Nigeria. This situation needs attention for sustainability of food security system.

Table 3: Use of indigenous and recommended storage structures

Technology	Farmers Freq. %	Traders Freq. %	Housewives Freq. %	Farmers Freq. %
Indigenous				
Platform	0.00	0.00	0.00	0.00
Mud Rhumbu	0.00	0.00	0.00	0.00
Local Crib	10 (5.55)	1 (0.55)	1 (0.55)	12 (6.66)
Ceiling Top under Roof	0.00	0.00	1 (0.55)	1 (0.55)
Hanging over Fireplaces	0.00	0.00	0.00	0.00
Sacks	18 (10.0)	30 (16.66)	20 (11.11)	68 (37.77)
Bowls	0.00	3 (1.66)	4 (2.22)	7 (3.88)

Recommended

Improved crib	10 (5.55)	2 (1.11)	1 (0.55)	13 (7.22)
Stores and Warehouses	15 (8.33)	14 (7.77)	1 (0.55)	30 (16.66)
Drum and Hermetic Containers	6 (3.33)	4 (2.22)	18 (10.0)	28 (15.55)
Polyethylene-lined bags	1 (0.55)	4 (2.22)	14 (7.77)	19 (10.55)
Silos	0.00	2 (1.11)	0.00	2 (1.11)

In urban Southwest Nigeria, use of recommended grain storage structures (51.1%) was about the same with that of indigenous structures (48.9%). Sacks constituted the most commonly used indigenous structure (37.77%). While this is confirming the subsistence level of grains holding, there is need for aggressive extension work, especially among traders and housewives so as to sustain grain holdings for food security.

Table 4: Determinants of Use of Recommended Food Grains Storage Technologies

Determinants	Standard Scores (Z-rounded)				
	Very High	High	Average	Low	Very Low
Situational Factors					
Literacy	0	1	1	2	2
Capital Availability	0	1	1	2	3
Tradition	0	1	1	2	2
Storage Duration	0	1	2	2	3*
Need Based Technology	0	1	2	2	3*
Communication Factors					
Extension Agent Contact	0	1	2	2	3*
Adoption by Peers	0	1	2	2	3*
Media Presentation	0	1	2	2	3*
Cooperative Society Initiative	0	1	2	2	3*
Local Leader Presentation	0	1	2	3	3*
Technology Attributes					
Technology Cost	0	1	1	2	3
Efficiency of Technology	0	1	2	2	3*
Accessibility of Technology	0	1	2	2	3*
Flexibility of Technology	0	1	2	2	3*
Stored Quantity	0	1	2	3	3*
Technology Location	0	1	1	2	3
Perceived Incentives					
Credit Facilities	0	1	1	2	2
Participatory Technology Development	0	1	1	2	3
Government Subsidy	0	1	1	2	2
Perceived Disincentives					
Produce Pilferage	0	1	1	2	3
Technology Maintenance	0	1	2	2	3*

*Favourable Determinants with Progressive Z-rounded scores from 0 to 2 and up to 3.

Table 4 presents data on factors considered necessary for use of recommended grain storage technologies in this study. The factors were categorized into situational factors, communication factors, technology attributes, perceived incentives and perceived disincentives. Of all the situational factors, only storage duration and need based technology were considered favourable, while all the communication factors (extension agent contact, adoption by peers, media presentation, cooperative society initiatives and local leader presentation) were considered favourable. This finding has buttressed the assertion that interpersonal communication is very important in extension work (Adekoya and Ajayi 2000, Torimiro, Adedoyin and Alao 2000) and that urban dwellers assess education information through mass media (Apantaku 2000). The use of various sources of information simultaneously will contribute to the sustainability of food security education in urban Southwest Nigeria. Technology attributes that were favourable are; efficiency of technology, accessibility of technology, flexibility of technology and stored quantity. These have confirmed the earlier work of Rogers (1995) that an innovation is judged through triability, relative advantage, compatibility, observability and complexity.

All the perceived incentives; credit facilities, participatory technology development, government subsidy was not considered favourable for use of recommended food grains storage technologies. The implication here is that urban dwellers are favourably disposed to the use of recommended storage technologies in as much as the technology is relevant, socially desirable, and economically attainable. Of the two perceived disincentives (produce pilferage, technology maintenance) only technology maintenance is considered favourable. This centred on the ability to be able to maintain the technology at low cost. It is important to develop technologies that are economically feasible to small holders.

Other Problems of Grains Storage

Apart from problems of pests, insects, moulds, rodents, birds and other vertebrates, respondents were asked to indicate other areas they have problems in carrying out effective grain storage.

Table 5: Analysis of other problems of grain storage by respondents

Problems of grain storage	Frequency	Percentage
Drying	47	26.1
Expired Chemicals or Adulterated	82	45.6
Lack of Initial Capital to Invest	64	35.6
Marketing Outlets	28	15.6

From Table 5 above, more than one quarter of respondents (26.1%) had problem of grain drying. This is very common with the production of early maize. The necessity arises for governmental and non-governmental organizations to not only finance research into crop drying, but also provide mechanized dryers for cooperative groups on agreed terms. Less than half of the respondents (45.6%) had problem about purchase of expired or adulterated chemicals. The implication here is that there is need for legislative control over sales of agro-chemicals. More than one third of the respondents (35.6%) lacked initial capital to invest on grain storage. Credit facilities, loans, subsidies should be provided for post-harvest activities as it is done for crop production. Few respondents (15.6%) had problems of marketing their produce. Extension should encourage cooperative actions while government should introduce the concept of Buyer of Last Resort.

Table 6: Analyses of socio-economic characteristics of respondents and use of modern grain storage technology

Variables	Cal.	df	p	Decision
Gender	$X^2=7.04$	1	0.05	S
Educational Status	$X^2=5.5$	3	0.05	NS
Age	$r=0.91$	4	0.05	S
Quantity of Grains Stored	$r=0.98$	4	0.05	S

S = Significant   NS = Not Significant

The Chi-square results in the table above showed that there is significant relationship between gender and use of modern grain storage technology ($X^2cal = 7.04$ $X^2tab = 3.84$) while educational status is not significantly related in urban Southwest Nigeria ($X^2cal = 5.5$ $X^2tab = 7.82$). The implication is that extension should critically look into the areas of addressing urban grain storage technologies especially among traders and housewives and not concentrate on farmers alone.

Correlation analyses revealed significant relationships between age and use of modern grain storage technology ($r_{cal} = 0.91$, $r_{tab}=0.81$), as well as quantity of grains stored ($r_{cal} = 0.98$, $r_{tab} =0.81$). Planning for sustainability of food security programme should concentrate on old people while extension should critically address the needs of large holders. The second hypothesis revealed a significant difference among farmers', traders' and housewives' levels of use of recommended grain storage technologies in urban southwest Nigeria (W = 2213.4, $X^2_{cal} = 19920.6$).

Table 7: Coefficient of concordance analysis of use of modern storage levels among farmers, traders and housewives

Variables	W	X^2_{cal}	X^2_{tab}	Decision
Use levels	2213.4	19920.6	9.49	S

S = Significant at 0.05

It is necessary that factors important and relevant for adoption of technologies by different users be employed (Mariyono 2007, Carletto et al 2007, Devereux 1998). For sustainability of food

security in the study area, extension should not only focus on farmers, but critically look into important roles of traders and housewives in food storage for food security.

SUMMARY AND RECOMMENDATIONS

There was development of recommended food grains storage technologies in Southwest Nigeria. The technologies were developed for domestic, farm and commercial uses. They are therefore suitable for farmers, traders and housewives. Use of recommended technologies was high at levels of sorting, drying and pre-storage treatment of grains whereas the most important level of storage in modern structure recorded an average score. Apart from few situational factors and perceived disincentives, technology attributes and communication factors are important factors for use of food grains storage technologies in urban Southwest Nigeria. Incentives are not important. There were other problems of grain storage apart from pests; drying, sales of expired or adulterated chemicals, lack of initial capital to invest and marketing outlets.

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

1   Efforts should be made towards linking research and recipients (farmers, traders and housewives) in the areas of urban grain storage.

2   Various communication channels should be used simultaneously to reach urban dwellers.

3   There is need for legislative control over sales, distribution and use of agro-chemicals, especially pesticides.

4   Governments at various levels and organized private sector should go into commercial warehousing of grains.

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Utilization of Information and Communication Technology (ICT) among rural women in Oyo State, Nigeria

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Abstract

Women are the driving force of agriculture in Nigeria and therefore need adequate and current information on agricultural activities and other aspects of their lives. This study assessed rural women's utilization of ICT to source development information. Three Local Government Areas were purposively selected from the thirty-three LGAs in the State while random sampling technique was used to select two hundred and forty respondents across the three States. Data were collected through the use of interview schedule and analysed using descriptive and inferential statistics. The findings from the study revealed that 40% of the women were within age range 20-40years, 46.7% had no formal education. About 88.3%, 16.7% and 1.7% utilized radio, mobile phone and internet respectively. Illiteracy (75.0%), low income (66.7%),lack of power supply(75.0%) and heavy workload (65.0%) prevented rural women from using ICT effectively. Chi-square result shows that age (χ^2=29.400),marital status(χ^2=76.133), level of education (χ^2=30.167) and occupation (χ^2=22.167) were significantly related to ICT utilization. Adult literacy education using extension agents should be encouraged among the rural women and there should be rural development in terms of social amenities especially electricity because all these ICTs need these amenities to function well.

Keywords: Information and Communication Technology, utilization, rural women, infrastructure

INTRODUCTION

Information and Communication and Technology (ICT) can be defined as any product that will store, retrieve, manipulate, transmit or receive information in a digital form. It also consists of innovations that facilitate the capturing, storage, processing, transmission and display of information by electronic means. According to FAO (2005), ICT captures a multitude of equipment and services. These consist of satellite communication systems, mobile phones, phone booths, hand held computer, imaging and acoustic technologies, websites, radio, television, tape recorder, newspapers, fax machines, pamphlets, magazines, extension agents etc. (Nwakure and Ohagwu, 2009).

ICT has proven to be the most single powerful tool for development in the past decades, bridging communication gaps and creating common language for creation of opportunities, connecting people and creating channels for personal and country development (Ayman, 2007). It is an effective tool in the hands of women to enable them extend their participation in a variety of productive fields and providing them with an avenue to express the development of their personalities and capacities. (Kazanka and Dada, 2007).

Women who live in rural areas are at a particular disadvantage in the digital world, facing multiple barriers relating to both gender and location when compared to their urban counterparts. There is also a gender disparity in access to vital information and they are found at the consumer end of information chain which is believed to be a tool for agricultural development. This appalling situation of rural women lead to the catalytic role of ICTs in facilitating agricultural development to the world's poor.

Most poor women in developing countries are further removed from the information age and they need ICT to access information which is of importance to their reproductive, productive and community roles. Access to ICT will enable women gain a strong voice in their communities and can also be of particular value in fighting social isolation where they experience such. Access to ICT means physical access and utilization of it, it also refers to the ability to make use of the information and the resources provided. There is a critical gap between internet access and access to useful web content. It is the access to and ability to make use of information that will impact on socio-economic and agricultural development, not accessibility alone. (ICT update, 2009)

Radio as an example of ICT is common with rural women due to its ready access, affordability, appropriateness and due to the fact that they can still listen to it while they undertake their household activities (Eniola *et al*, 2007). However, the listening time of radio for women is limited because of the household chores, responsibilities for children and elderly and maximum concentration may also not be guaranteed. Unavailability of power supply and low income has made the use of television a pipedream for most rural women. Internet has fewer users among rural women who are illiterate because large areas are still not connected, and the installation costs are very high. Even though internet and mobile phone networks continue to spread rapidly throughout the world, it may still take many years before the most remote and rural areas are connected.

While the potential of ICT in stimulating economic growth, socio-economic development and effective agricultural production is well recognized,

the benefits of ICT have been unevenly distributed within and between countries and groups. Despite the great progress already made in the field of ICT, there are still economic and technological factors hindering universal access and effective utilization of ICT based in rural women activities. The factors identified as constraints to access and use of ICTs are poverty, illiteracy, language barrier and other social and geographical factors like location, mobility and social class. (Sandys, 2005)

Though rural women are lagging behind in the use of ICTs, there is assurance that this trend can be changed if ICTs will address the actual needs of rural women like hygiene, sanitation, water, disaster management, reproductive health. It is essential that the affordability, awareness, accessibility and ICTs appropriateness should be considered. If people on less than one dollar per day in a country like Nigeria cannot afford a technology, access it and adapt it to their social, economic and cultural needs, then they may never invest in it. It is on this background that the utilisation of ICT among rural women in Oyo State was assessed.

The specific objectives of this study are to determine the personal characteristics of rural women, examine the level of awareness of rural women on ICT, -assess the extent to which rural women have access to, and utilise ICT, identify the type of information that rural women obtain from different ICTs and determine the constraints affecting the use of ICT by rural women in Oyo State of Nigeria.

METHODOLOGY

The study was carried out in Oyo state which is located in South Western Nigeria. Oyo State is located between latitudes 6^0N and 9^0 and between longitude 3^0E and 4^0E and covers a total landmass of 27, 24957km. The population of the study consisted of rural women. The area of study was stratified into urban and rural areas, out of which only rural areas was chosen for the study. Oyo state has 33 Local Government Areas, out of which three were purposively chosen due to their degree of rurality and they are Saki East, Ibarapa Central and

Surulere Local government Areas. Four villages were randomly selected from each Local Government Area giving a total of 12 villages. Twenty rural women were also randomly selected from each village making a total of 240 respondents that form the sample size for this study. Structured interview schedule was used for data collection while frequencies and percentages were used to describe the personal characteristics of respondents, awareness and utilisation of ICT and constraints to the use of ICT. Chi square was used to test the relationship between selected personal characteristics of respondents and utilisation of ICT.

RESULTS AND DISCUSSIONS

Table 1 reveals that 40.0% of the respondents fell between 20 – 29 age brackets followed by those in the age bracket 30-39 (16.6%). This implies that most of the rural women were in their active age and would still be in need of information that would be useful in several aspects of their activities. Also 73.3% of the respondents were married indicating the fact that they would be occupied with several household activities in order to take care of every member of the family, limiting the time to utilize several ICTs.

Table 1 also shows that 46.7% of the respondents did not have formal education limiting their access to the use of ICT even when they were available. Fifteen percent of the respondents had tertiary education. This will definitely help them to have better knowledge of the benefits of various ICTs which would enhance motivation for ICT use, hence, an envisaged improvement in their agricultural practices and other income generating activities with overall effect on their standard of living. About 28.0% of the respondents were earning less than ₦ 10,000 per annum from their various productive activities and 38.3% earned between ₦10,000 and ₦59,000 as shown in Table 1. It is clear that these rural women could not afford the purchase of different ICTs due to their low income which is not even sufficient to meet their livelihood needs.

Table 1: Distribution of respondents by their socio-economic characteristics

Socio-economic characteristics	Frequency (%)
Age	
<20	48 (20.0)
20 -29	96 (40.0)
30 – 39	40 (16.6)
40 – 49	28 (11.7)
50 – 59	28 (11.7)
Marital Status	
Single	12 (5.0)
Married	176 (73.3)
Divorced	52 (21.7)

Socio-economic characteristics	Frequency (%)
Religion	
Christianity	108 (45.0)
Islamic	132 (55.0)
Traditional	–
Level of Education	
No formal education	112 (46.7)
Primary education	32 (13.3)
Secondary education	48 (20.0)
Tertiary education	36 (15.0)
Adult literacy education	12 (5.0)
Occupation	
Trading	92 (28.3)
Farming	56(23.3)
Civil service	32 (13.4)
Artisan	60 (25.0)
Level of Income (per annum)	
Less than 10,000	68(28.4)
10,000 – 59,999	92(38.3)
60,000 – 109,999	48(20.0)
110,000 and above	32(13.3)
Household Size	
1 – 3	64(26.7)
4 – 6	112(46.7)
>6	64(26.7)

Source: Field survey, 2010

Table 2 reveals that most of the rural women were aware of various ICTs like radio (100%), television (96.7%) and mobile phone (83.3%); it is only internet that has the lowest percentage (41.7%). This implies that despite the progress in technology, most of the rural women are still not aware of internet may be due to the complexity of its use and lack of interest. Extension agents and development agencies must enlighten rural women on the significance of internet as it is being used in several parts of Africa like Mali, Kenya, Tanzania and Uganda such as to strengthen and connect rural organizations as well as women in remote areas (Farming Matters, 2011).

Table 2: Distribution of respondents by their awareness of ICT

ICT	Yes (%)	No (%)
Radio	240 (100.0)	-
Television	232 (96.7)	8 (3.3)
Internet	100(41.7)	140 (57.3)
Mobile phone	200 (83.3)	40 (16.7)

Source: Field survey, 2010

The common ICTs utilized by rural women were radio (88.3%) and television (33.3%) as shown in Tables 3.Radio is the cheapest ICT that an average rural woman can afford especially transistor radio which will not have to depend on electricity but use of batteries. This corroborates the position of Farming Matters (2011) that radio is still the cheapest and most efficient tool for spreading messages about a broad range of issues like farming, democracy or lifestyle. The significance of internet and mobiles phone should be emphasized as information from these ICTs will also be of great relevance to the rural women.

Table 3: Distribution of respondents according to their utilization of ICT

ICTs	Yes (%)	No (%)
Radio	212 (88.3)	28 (11.7)
Television	80 (33.3)	160 (66.7)
Internet	4 (1.7)	236 (98.3)
Mobile phone	40 (16.7)	200 (83.3)

Source: Field survey, 2010

Table 4 indicates information obtained from different ICTs which range from agricultural, health, educational, political, entertainment/sport information and nutrition/home management information. Of all the ICTs, rural women obtain information from radio than other ICTs which implies that radio workers and broadcasters should give relevant and timely information on all areas of feminine life as they will rely on information from radio especially in their local languages. Very few respondents (1.7%) received information on agricultural, health and education through the internet implying a very low usage of this channel. This corroborates the findings of Oluwatayo and Ahmed (2007)) that women's low level of income, limited education and non – involvement in ICT projects constitute significant factors that limit their use of ICT. This suggests that the use of ICTs by rural women can only be enhanced if they are gender sensitive and address the local needs and concerns of rural dwellers.

Table 4: Types of information obtained from different ICTs

Types of information/various ICTs	Frequency (%)
Agricultural Information	
Radio	152(46.7)
Television	20(8.3)
Internet	4(1.7)
Mobile phone	8(3.3)
Health information (e.g., HIV/AIDs, malaria, family planning)	
Radio	128 (53.3)
Mobile phone	40 (16.7)
Television	12 (5.0)
Internet	4 (1.7)
Educational Information	
Radio	160 (66.7)
Mobile phone	16 (6.7)
Television	20 (8.3)
Internet	4 (1.7)
Political Information	
Radio	120 (50.0)
Mobile phone	20 (8.3)
Television	40 (16.7)
Internet	-
Entertainment/Sport Information	
Radio	172 (71.6)
Mobile phone	40 (16.7)
Television	14 (5.8)
Internet	-
Nutrition/Home Management information	
Radio	100 (41.7)
Television	24 (10.0)
Mobile phone	40 (16.7)
Internet	-

Source: Field survey, 2010

As shown in table 5, low income (66.7%), heavy workload (65.0%), illiteracy (75.0%) and lack of power supply (75.0%) were the major constraints to the use of ICT. They also identified un-affordability as part of the constraints to the use of some ICTs.

Table 5: Distribution of respondents by constraints to the use of ICTs

Constraints	Yes (%)	No (%)
Low income	160(66.7)	40(44.3)
Heavy workload	156(65.0)	84(35.0)
Illiteracy	180(75.0)	60(25.0)
Ignorance	80(33.3)	160(66.7)
Restraint from husband	12(5.0)	228(95.0)
Language barrier	72(30.0)	168(70.0)
Lack of technical know how	40 (16.7)	200(83.3)
Power supply	180(75.0)	60(25.0)

Source: Field survey, 2010

Chi-square result above shows that age, marital status, level of education, occupation and income are significantly related to utilization of ICT. This implies that older women may not be able to utilize ICT compared to younger women. Also, education is an important factor for the utilization of ICT. The type of occupation engaged in also has a significant influence on the use of ICTs because of the different information needs.

Table 6: Chi-square result on socio-economic characteristics and utilization of ICT

Variables	χ^2 value	df	Sig. level	Decision
Age	29.400	4	0.000	S
Marital status	76.133	2	0.000	S
Income	17.860	3	0.000	S
Level of education	30.167	4	0.002	S
Occupation	22.167	3	0.000	S

Source: Data analysis, 2010

CONCLUSIONS

The study revealed that most of the rural women were married, and in their active productive years with low level of educational attainment and income therefore cannot afford ICTs usage. Radio, Television and to a lesser extent, Mobile phone were the ICTs that the rural women utilized. Women received agricultural, health, educational, political, and entertainment information from various ICTs with radio as the most frequently ICTs source used. Low income, heavy workload, illiteracy and lack of power supply were the major constraints to the utilization of ICTs. In spite of the constraints, rural women were still able to access useful information from the few ICTs available which they could afford for their self-development, and by implication, that of their communities. Age, marital status, income, level of education and occupation were found to have significantly affected the utilization of ICT.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:
1. Adult literacy classes and trainings on ICT should be organized for rural women by extension agents and other government agencies. This will boost rural women's interest and involvement in the use of ICT.
2. Provision of infrastructures especially power supply and communication network should be emphasized in the rural areas.

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Assessment of human resource management in oil palm industries of Edo state, Nigeria

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Abstract
This study assessed the human resource management in Presco and Okomu oil palm companies, in Ikpoba- Okha and Ovia- South West Local Government Areas of Edo state. The specific objectives of the study were to; ascertain the socio-economic characteristics of employees, determine motivational factors, verify relationship between management and employees, assess management system practices and identify the challenges facing employees and management. Forty employees from each of the two companies were randomly selected, making a total sample size of 80 respondents. Data were obtained with the use of structured questionnaires and were analyzed using frequency count, percentages, correlation coefficient and t-test. Findings of the study revealed that both males and females work in oil palm companies (Presco male: 71.8%, Okomu female: 73.5%).Majority are married (Presco: 59%, Okomu: 67%), Christians (Presco: 92.3%, Okomu: 100%), within the age bracket of 31-40years (Presco: 56.4%, Okomu: 97.1%), and educated (Presco tertiary: 43.6%, Okomu tertiary: 38.2%). Majority of the workers have spent 6-10years on the job (Presco: 41%, Okomu: 35.3%), and their monthly salary level is between ₦ 20,000 and ₦50,000 (Presco: 48.7%, Okomu: 47.1%). Results showed that rules are followed rigidly ($\bar{x}$ =2.27), clear instructions are also given to employees ($\bar{x}$ =2.26), and managers guide actions of the employees ($\bar{x}$ =2.12). However, respondents in Okomu agreed that management gives necessary criticism ($\bar{x}$ =4.12), as the management system to enhance job performance, while Presco respondents did not agree to that ($\bar{x}$ =2.18). Significant differences existed between Presco and Okomu in terms of management-employee relationship (t= 4.860, P< 0.05) and management system practices (t=3.054, P< 0.05). In conclusion, oil palm workers are not well remunerated, while the management systems need to be reviewed. This can be directly linked to the formal relationship within the organization and the autocratic system of management practiced. The study therefore recommends that democratic system of management should be practiced.
Keywords: Human resource management, Oil palm industries, Employees, Job performance

Introduction

Human resource management encompasses the activities designed to provide and coordinate the human resource of an organization. Human resource management refers essentially to the activities of personnel of an organization in achieving the organization's objectives (Cole, 1991 and Akinmayowa, 2006). Human resource management was defined by Cuming (1980) as being concerned "with obtaining the best possible from staff for an organization and having got them, looking after them so that they will want to give their best to their job". In general, human resource management aims at ensuring that the employees of a company are used in such a way that the employer obtains the greatest possible benefit from their abilities and the employees obtain both material and psychological reward for their work (Graham, 1991). Given the current high-food demand in the country, and the rapid population growth, there is an increasing need of agricultural development to specifically expand food production. This situation could be ameliorated by proper management of human resources in the agricultural sector as agriculture is currently labour-intensive rather than capital-intensive.

The palm oil from the eastern region was described as being of highest quality and the people took pride in their work. According to Agha (2007), the people were so good at it that the Malaysians followed the scent of the palm oil to Imo State to learn the fine art of palm oil production. Currently, Malaysia which came here to learn about palm oil production is the world's number one producer and exporter of crude palm oil.

Palm oil, apart from being a major ingredient for food, has other myriad of uses. It is used in cosmetic production and is more importantly one of the raw materials in bio-diesel production. According to experts, biodiesels are biodegradable and when burnt, have fewer emissions than petroleum base fuels. Thus, bio-diesels are being looked upon as possible alternative energy source (Agha, 2007). Oil palm production plays significant role in the Nigerian economic development. These roles include;

❖ Contributions to the country's Gross Domestic Product,
❖ Source of income and decent living for a large proportion of the population,
❖ Provision of adequate food for the people,
❖ Supply of raw materials required by the industrial sector,
❖ Generation of foreign exchange through export, and
❖ Provision of employment opportunities for the teeming population (Alegre, 2006).

Oil palm production provides palm oil, kernel cake, palm wine and other secondary products; it also provides employment for Nigerian citizens. Agricultural work force in oil palm production includes farm labourers, official

employees, and management staff. There is the need to manage those employed in oil palm companies, so that productivity could be enhanced. One of the effective ways to do this is to positively influence the labour component of productivity.

The importance of human resource and their management remain crucial to any organization and economies. It is often argued that human resource management is increasingly crucial for organizational growth. Yet, despite the importance of human resource management as a specialized business function and set of practices, it is relatively a new area of interest in today's organizations (Rowley and Abdul-Rahman, 2007).

The Nigerian economy is based predominately on agriculture. With population increasing, production of food will also need to expand by the same amount. Agricultural human resources which can be the major catalyst to bring about change have not been given much attention.

Managing human resources can be very challenging. Oil palm companies have a significant role in the national economy in that it provides food for the people, provides employment, increases farmer's income and increases Gross Domestic Product (GDP) and Gross National Product (GNP) of the country through foreign capital earned from exportation of oil products. There is therefore the need for the proper management of those working in the agricultural sector.

Human resource managers are faced with challenges which pose threat to the normal running of agricultural business. These challenges include; workforce diversity, emerging technologies, regulatory changes, structural changes to organization and management changes within the organization (Byars and Leslie, 2000). Human resource managers find it difficult to treat everyone equally in the workplace, as they have varying cultural background, gender, age and lifestyles. Other challenges involved in human resource management include lack of appreciation for merit and hard work, delaying promotion, motivation, inadequate health services, etc (Okoh, 1998).

The changing regulations of government have a tremendous burden on human resource managers. Often, new regulations require significant paper work and also require costs. This burden is a challenge to the human resource manager as he tries to adjust to such change. Also, new technologies are emerging everyday; computerized systems are now being used to maintain data and evaluate daily business performance. This as well poses a challenge to the manager as he requires technical skills to use these technologies.

Today's organizations are undergoing many structural changes. These changes are caused by downsizing which results in outsourcing, and also rightsizing. These structural changes present challenges for human resource managers (Byars *et*

al, 2000). Managerial changes within an organization are also a challenge. Most managers do not empower or motivate their employees or allow them to take part in decision making process. This will bring about a strain in relationship between management staff and employees leading to grievances, increased staff turnover rate and thus reducing productivity. Assessing human resource management in oil palm companies will therefore go a long way in providing ways through which these challenges can be managed. According to Graham (1991), human resources are much more difficult to manage than material resources, partly because conflict often occurs between the employer and employees, partly because to an increasing extent, employees try to share in decision-making.

This study highlights human resource management in agriculture, its various challenges and how these challenges could be managed. The impetus which human resource management can give towards increased productivity and efficiency, not just in agricultural production but also to the gamut of agribusiness in Nigeria were ex-rayed.

Against this background, this study aimed to proffer solutions to the following research questions;
i. What type of working relationship exists between management staff and employees?
ii. What kind of management system exists in oil palm companies?

Objectives of the Study
The general objective of this study is to assess human resource management in oil palm companies in Edo state. The specific objectives of this study were to:
i. ascertain the socio-economic characteristics of personnel in oil palm companies in Edo - State
ii. verify the working relationship between the management staff and employees; and
iii. assess management systems of administration in Okomu and Presco oil palm companies

Hypothesis: The hypothesis for this study was stated in the null form that there is no significant difference between Okomu and Presco human resource management in terms of management – employee relationship and management systems.

METHODOLOGY
This study was conducted in Okomu and Presco Oil Palm companies, located in Ovia South-west and Ikpoba-Okha Local Government Areas of Edo State. Okomu and Presco Oil palm industries were purposively selected because both are typical oil palm industries that are actively involved in human resource management. A Simple random sampling technique was used to select 40 respondents (employees) each from the list of workers of the two oil palm companies to make up a sample size of 80 However, only 39 and 34 of the returned copies of questionnaire from the

respondents in Presco and Okomu respectively were useful for the study.

The data collected were subjected to descriptive (use of frequency, percentage, mean, standard deviation) and inferential (t-test) statistical analysis.

RESULTS AND DISCUSSION
Socioeconomic Characteristics
Results in Table 1 showed the Socio- Economic characteristics of respondents Gender distribution: **-** Result showed that in Presco, males dominate with a percentage of 71.8%, while females are the majority in Okomu (73.5%). The result therefore suggests that both males and females work in oil palm industry. A possible reason why there were more males in Presco than in Okomu may be that Presco industry is more mechanized than Okomu oil palm industry in which case Okomu employs more female to do the manual work.

Age - Result shows that the dominating age bracket of 31-40 years are the same for both companies, with Presco having 56.4% and Okomu, 97.1%. This result suggests that most workers in palm oil industries are young and energetic.

Marital Status: - Result shows that majority of the employees from both companies are married. The percentage of married workers in Presco and Okomu are 59 and 67 respectively. This

result implies that employees have other responsibilities aside official work.

Educational Level: - The general result shows that respondents are fairly educated; 48.7% and 43.6% of workers in Presco have both secondary and tertiary education, while 26.5% and 38.2% of workers in Okomu have secondary and tertiary education. This will have an effect on the workers' overall efficiency in the oil palm industries.

Working experience: Result shows that majority of staff in both Okomu (70.6%) and Presco (58.9%) have spent 6-15 years in the oil palm companies. This will probably improve the companies' productivity and is an indication that staff are fairly taken care of to make them stay for such a period of time.

Income status: Results shows that the highest monthly salary level is between ₦20,001 and ₦50,000, for Presco (48.0%) and Okomu (47.1%). This could imply that the management of both companies might have been collaborating in fixing salary for their staff. However, the salary level is quite low which can have a negative effect on employees' job performance. According to Byars et al (2000), the organizational reward system often has a significant impact on employees' performance and job satisfaction. Therefore, salary of employees in oil palm companies should be increased so as to enhance better job performance.

Table 1: Socioeconomic Characteristics of respondents

Variables	PRESCO (n = 39)		OKOMU (n = 34)	
	Frequency	Percentage	Frequency	Percentage
Gender				
Male	28	71.8	9	26.5
Female	11	28.2	25	73.5
Age				
Below 30	4	10.3	-	-
31-40	22	56.4	33	97.1
41-50	10	25.6	1	2.9
Above 50	3	7.7	-	-
Marital Status				
Single	15	38.5	11	32.3
Married	23	59.0	23	67.6
Separated	1	2.6	-	-
Educational Level				
Primary Education	3	7.7	12	35.3
Secondary Education	19	48.7	9	26.5
Tertiary Education	17	43.6	13	38.2
Working Experience				
Less Than 6 Years	5	12.8	7	20.6
6-10 Years	16	41.0	12	35.3
11-15 Years	7	17.9	12	35.3
16-20 Years	2	5.1	3	8.8
Greater Than 20 Years	9	23.1	-	-
Income (₦)				
Less than ₦20,001	9	23.1	9	26.5
₦20,001 – ₦50,000	19	48.7	16	47.1
₦50,001 – ₦100,000	1	2.6	1	2.9

Nature of Management - Employee Relationship in Okomu and Presco Companies

Table 2 shows the nature of management - employee relationship. Results showed that rules are followed rigidly ($\bar{x}$=2.27), clear instructions are also given to employees ($\bar{x}$=2.26), and managers guide actions of the employees ($\bar{x}$=2.12). However while in Presco, rules are followed rigidly ($\bar{x}$=2.10), in Okomu, rules are not followed rigidly ($\bar{x}$=2.47), instructions are clearly given ($\bar{x}$=2.68), the

management also guides employees ($\bar{x}$=2.53) and relationship is also formal ($\bar{x}$=2.09). This implies that Okhomu Oil Palm Company has a better management- employee relationship than Presco Oil Palm Company. According to Pieterse (2008), Management-Employee relationship will improve productivity by improving employee morale, loyalty, turn around and communication. So there is the need to improve management- employee relationship.

Table 2: Nature of Management-Employee Relationship in Okomu and Presco

Nature of relationship	PRESCO		OKHOMU		TOTAL	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Rules are Followed Rigidly	2.10*	0.9	2.47*	0.8	2.27*	0.9
Clear Instruction	1.90	0.7	2.68*	0.7	2.26*	0.8
Management Guides Employee	1.77	0.7	2.53*	0.9	2.12*	0.9
Formal	1.64	0.8	2.09*	0.7	1.85	0.8
Flexible	1.31	0.6	1.74	0.7	1.51	0.6
Effective Communication	1.54	0.8	1.76	0.9	1.64	0.8

Likert scale: Always= 3, Sometimes= 2, Never= 1

Management System Practices in Okomu and Presco Companies

Table 3 shows the management practices of both Okomu and Presco companies. The result indicated that management gives necessary criticism/ discipline ($\bar{x}$=3.12). However, respondents in Okomu agreed that management gives necessary criticism ($\bar{x}$=4.12), while Presco respondents did not agree to that ($\bar{x}$=2.18), suggesting that the actions of employees are not

generally criticized. The result from the table also indicates that decision making and planning are done only by management. This implies that the management system practiced in oil palm companies is autocratic. Okoh (1998) described autocratic management system as using authority to compel workers to do what they are told, thereby restricting them from participating in decision making. He further suggested that for the purpose of motivation and effective job performance, the democratic management system or leadership style is ideal.

Table 3: Management Systems Practiced in Okomu and Presco

Management Systems	PRESCO		OKOMU		TOTAL	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Management gives Necessary Criticisms and Discipline	2.18	1.6	4.21*	0.9	3.12*	1.7
Employees Participate in Planning	1.51	1.1	1.76	0.9	1.63	1.0
Employees are Left to Take Actions	1.85	1.2	1.68	0.8	1.77	1.0
Decision Making & Planning are Done by both Employees and Management	1.33	0.9	1.26	0.6	1.30	.8

Likert scale: Strongly agree=5, Agree=4, No response=3, Disagree=2, Strongly disagree=1.

Hypothesis Testing: There is no significant difference between Presco and Okomu Human Resource Management.

Table 4 expresses the difference between Presco and Okomu Human Resource Management in terms of management- employee relationship and

management system used. Result showed that there is a significant difference between Presco and Okomu in terms of management- employee relationship (t= 4.860, P< 0.05) as this is better practiced in Okomu than Presco. There is also a significant difference between management system

practices in Okomu and Presco (t=3.054, P< 0.05) as is better in Okomu than Presco. The probable reason for this could be the management practices adopted in the two companies. It is expected that a company that provides criticism to its staff may have better discipline and therefore better productivity than the one not providing criticism.

Table 4: Difference between Presco and Okomu Human Resource Management.

Variables	Company	Mean score	Mean difference	t–value	Sig level (2-tailed)
Management Employee Relationship	Presco	10.26	3.008	4.860	0.000*
	Okomu	13.26			
Management System	Presco	8.15	2.434	3.054	0.003*
	Okomu	10.59			

Source: Field Survey; *Significant at $p \leq 0.05$

CONCLUSION

The key factor of any organization is improving their human resource. The study has shown that the management of Oil Palm Companies takes decision only without involving the employees which is a form of autocratic management system. Also the study established that proper management-employee relationships are not maintained in these companies.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made;

1. Management should create a certain level of informal relationship that would enable them to share a cordial relationship with their employees. This would give management an insight into the appropriate and specific factors that motivate workers.
2. Democratic system of management is of great essence in an organization as it would make workers exhibit their potentials and initiatives. This would also enable workers partake in decision making that would be beneficial to the company.

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Analysis of farmers' participation in agricultural extension programmes in North-western Nigeria

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Abstract

This study assessed farmers' participation in agricultural extension intervention programmes in the North-western zone of Nigeria. Structured, pretested and validated interview schedule was used to collect data from 600 respondents selected in Kaduna and Kano States through multi-stage random sampling techniques. Frequency table, percentages, and weighted mean were used to analyze the data. Chi-square was used to determine the relationship between farmers' socio-economic variables and their level of participation. Results showed that farmers' participation in extension intervention programmes was generally low. In order of severity, major hindrances to participation include poor involvement of people at the conception stage, lack of continuity, inadequate training, and inadequate extension agent. Socio-economic factors found to influence farmers' level of participation include education (X^2=6.92; $p<0.05$), membership of farmers' association (X^2=6.18; $p<0.05$), age (X^2=6.12; $p<0.05$), farming experience (X^2=5.64; $p<0.05$), income (X^2=4.61; $p<0.05$), benefits of association membership (X^2=3.41; $p<0.05$), and secondary occupation (X^2=3.13; $p<0.05$). The study recommended a shift from the traditional supply-driven extension to a more participatory one which involves farmers from the conception stage.

Keywords: Participation, extension intervention programme

INTRODUCTION

There is broad agreement that widespread participation of local stakeholders (different categories of farmers, plus representatives from private-sector firms, rural banks, NGOs and other groups) is an essential element affecting the success of agricultural extension programme. This participation according to Swanson (2008) should be through formally organized advisory committees and/or governing boards that represent all of the major stakeholder groups within the service area. External catalytic push was necessary because of the slow rate of growth in food production compared with a faster rate of growth in demand occasioned by increases in population and incomes. Furthermore, the agricultural extension system, meant to guide and facilitate farmers to improve their capability, needed regular re-invigoration in order to enjoy clientele involvement and participation. The characteristic shortage of competent extension agents also calls for regular, efficient and effective clientele participation in order to ensure sustainability.

The word participation has been interpreted in different ways by different people. Pretty (1994) identified how people participate in development programmes and projects in a seven (7) point typology of participation thus: passive participation, participation in information giving, participation by consultation, participation for material incentives, functional participation; interactive participation; and, lastly, self-mobilization. It is clear from this typology that the term participation should not be accepted without appropriate qualification. Participation by local people is one of the critical components of success in irrigation, livestock, water, and agriculture sectors (World Bank, 1994;

and Pretty, 1995). The terms "people's participation" and "popular participation" have now become part of the normal language of many development agencies (Bhatnagar & Williams, 1992). The term "participation" has been used to justify the extension of state control and to build local capacity and self-reliance; it has been used for data collection and for interactive analysis. Participation has often centered on encouraging local people to sell their labour in return for food, cash, or materials. Yet these material incentives distort perceptions, create dependencies, and give the misleading impression that local people are supportive of externally driven initiatives (Kerr, 1994). This means that "more often than not, people are asked or dragged into participating in operations of no interest to them, in the very name of participation" (Rahnema, 1999). If the objective of development is to achieve sustainable development, then nothing less than functional participation should suffice.

Participation is the act of working with others making value judgments and determining causes of actions within a social situation or structure. It is a process of combining the knowledge and vision of a man to supplement physical and mental needs to fellow men. Studies in different countries in Africa, have found that people participated in very different ways (Guijt, 1991). Narayam (1993) found that, in Africa, Asia and Latin America, participation was the significant factor contributing to project effectiveness, maintenance of water systems and economic benefits.

Participation promotes innovation and ownership, increase adoption rates and acceptability of new technologies. The approaches are flexible to adapt to suit each set of new conditions. It is an

opportunity to encourage linkages between the various actors such as researchers, farmers, extension agents and the input providers and increase learning from each other. The methods ensure farmers' responsiveness, build farmers' capacity to reflect, analyze and take action, and improve rapport between government and civil society. It also establish transparency, institutes accountability for stakeholders, assist in equity goals i.e. fair distribution of resources, improves performance since development lessons learnt catalyze project staff output.

As a matter of principle, clientele participation depends on one, the availability of an intelligent and rational leader (who is very generous); two, the extent to which the people have an effective voice or input in determining rules and conditions under which they live and work; and three, when there is: (i) a common goal or purpose, (ii) willingness and readiness to serve; and (iii) open communication which make the principles to be operational. People will be ready to participate fully in a program that affects them if they have been involved in the proposal and formulation of policies relating to the program.

Various extension intervention programmes have been supported by different international donors especially the World Bank and other multinationals. The extension intervention programmes undertaking by the States include: National Programme on Agriculture and Food Security (NPAFS), FADAMA II, Root and Tuber Expansion Programme (RTEP), Nerica rice production, Community-Based Agricultural and Rural Development Programme (CBARDP), Agricultural Enhancement, African Development Foundation, and Commercial Agricultural Development Project (CADP) etc.

This study was designed to assess the level of farmers' participation in extension programme; ascertain their perception on the factors affecting participation in the North-Western zone of Nigeria; and determine the relationship between socio-economic characteristics and level of participation by farmers.

METHODOLOGY

Twenty-five farmers were selected from twelve communities from twelve local government areas in two States (Kaduna and Kano) in the North-west agro-ecological through multi-stage sampling technique. The local government areas include Jemaa, Kudan, Kaura, Sabon-gari, Zango-Kataf and Zaria (in Kaduna State) and Bagwai, Kumbotso, Kura, Madobi, Makoda and Tofa (in Kano State). A total of 600 respondents were used for the study.

Structured interview schedule was used to elicit information from the selected respondents with the assistance of trained enumerators who understand the local language. Descriptive statistics like frequency counts, means, weighted mean score and percentages, and inferential statistics (Chi square) were employed to analyze the data collected.

To measure the level of severity of factors hindering farmers' participation in extension intervention programme, fourteen (14) problems were listed on a 4-point scale of Very Serious, Serious, Less Serious and not serious and assigned weight of 4, 3, 2, and 1 respectively. The mean for each problem was obtained by multiplying the point scale by the number of respondents in each point scale. Any problem with a mean score of equal or above the cut-off mean of 2.5 was regarded as perceived as serious and any mean of lower than 2.5 was perceived as not serious. Areas where clientele participation is crucial include programme planning, programme implementation, and programme evaluation including their contribution in cash or kind. Each of these items was rated as very high, high, moderate, low, or not at all with the assignment of 5, 4, 3, 2, 1 and 0 respectively. A weighted mean was then calculated to get the overall perception of respondents' level of participation. A decision point of 2.5 was set as high participation for each of the items while scores below 2.5 was regarded as low participation. Finally, the average of the weighted mean was calculated to arrive at the overall level of participation.

RESULTS AND DISCUSSION
Socio-economic characteristics of respondents

As indicated in Table 1, most respondents were male (88.7%), within the age range between 31 – 50 years (59.0%), married (97.0%), and had primary/Koranic education (70.8%). A large majority (89.2%) had above 10 years of farming experience; and (63.8%) cultivating between 1 -5 hectares of land. The long experience and the desire to increase their productivity could have enhanced their participation in intervention programmes. Also, respondents were engaged in different farming enterprises: crop (98.3%), livestock: cattle (33.2%), sheep and goat (72.2%), poultry (66.3%), fishing (2.3%); and fish farming (0.7%). Over 64.0% of the respondents belong to farmers' association enjoying different benefits. Over 60.0% realized only N200,000 and below as annual income. Also, respondents were engaged in different farming enterprises: crop (99.3%), livestock: cattle (43%), sheep and goat (83.8%), poultry (53.5%), fishing (1.0%); and fish farming (0.8%). The results indicate some level of homogeneity in farmers' characteristics. This could have enhanced group work and togetherness with attendant positive effects in active participation.

Table 1: Socio economic characterization of farmers in the North West zone (n = 600)

Variables	Frequency	Percentage
Sex		
Male	532	88.7
Female	68	11.3
Age		
30 and below	27	4.5
31 – 50	344	59
51 & above	219	36.5
Marital status		
Single	18	3
Married	582	97
Household size		
5 and below	135	22.5
6 – 10	210	35
11 and above	255	42.5
Level of Education		
None	62	10.4
Primary	114	19
Koranic/adult education	311	51.8
Tertiary education	113	18.8
Farming enterprise*		
Crop production	590	98.3
Cattle	199	33.2
Sheep & Goat	433	72.2
Poultry	398	66.3
Aquaculture	4	0.7
Fishing	14	2.3
Secondary occupation		
Trading	143	23.8
Civil servant	55	9.2
Artisan	64	10.7
Others	338	56.3
Farming experience		
1 – 10	65	10.8
11 – 20	141	23.5
Above 20	394	65.7
Farm size (ha)		
< 1	17	2.9
1 – 5	383	63.8
6 – 10	144	24
Above 10	56	9.3
Membership of Association		
Yes	388	64.7
No	212	35.3
Income of farmers (N/annum)		
1,000 – 100, 000	237	39.5
101,000 – 200,000	150	25
201,000 – 300,000	85	14.2
301, 000 – 400,000	35	5.9
401,000 – 500,000	24	4
Above 500,000	69	11.5
Benefits derived from membership of association* (n=388)		
Loan/subsidy	57	14.7
Exchange of idea/knowledge/information	28	7.2
Farm inputs	247	63.7
Increased income	15	3.9
Psychological satisfaction	74	19.1
Training plot	22	5.7
Extension visits	15	3.9

Source: Field survey, 2009
*Multiple responses

Level of participation in extension programme

As indicated in Table 2, the level of participation in all types of extension intervention programme can generally be described as low since the weighted mean was less than the mean of 3. In essence, farmers' do not participate in extension programme as expected. This can be attributed to the problem of the traditional top-down extension approach where the extension agent "knows all" instead of being a facilitator by encouraging the farmers to be part of the whole process. Monitoring and evaluation recorded the lowest participation indicating that farmers were hardly involved in this exercise. Monitoring and evaluation is very germane to the success of any agricultural extension programme (AEP) as successes depends on the efficiency and effectiveness to which M&E is performed. The major purpose of monitoring and evaluation is to provide the management with information on how efficiently the extension organization is operating. Das (1995) in her study on "improving the relevance and effectiveness of agricultural extension activities for women farmers", found that monitoring and evaluation system of extension activities in Nigeria is poor. According to her, this could be due to scarce resources (funds, inadequate extension personnel, transportation, etc.) of the national governments, inadequate training of extension personnel in the methods and skills of monitoring and evaluation of programme activities and the lack of clear directives from the extension service. This situation was buttressed by Adebayo, Babu and Rhoe (2009) who stated that inadequate monitoring and evaluation arrangements for policy implementation are also constraints and have led to situations in which policies and programs have lost sight of their original goals.

Table 2: Respondents' level of participation in extension intervention programmes in North-West Zone (n = 600)

Types/Expected areas of participation of clientele in extension programme	Levels of participation						Weighted mean	Over-all Perception
	Very High (5)	High (4)	Moderate (3)	Low (2)	Not at all (1)	Sum Total		
Programme planning	30 (5.0)	31 (5.2)	27 (4.5)	14 (2.3)	498 (83.0)	881	1.47	Low
Programme implementation	43 (7.2)	141 (23.5)	60 (10)	42 (7.0)	314 (52.3)	1357	2.26	Low
Monitoring & Evaluation	18 (3.0)	29 (4.8)	22 (3.7)	42 (7.0)	489 (81.5)	845	1.41	Low
Cash contribution	31 (5.2)	112 (18.7)	103 (17.2)	78 (13.0)	276 (46.0)	1344	2.24	Low
contribution in kind	58 (9.7)	127 (21.2)	144 (24.0)	47 (7.8)	224 (37.3)	1548	2.58	High
Average Weighted Mean							**1.99**	**LOW**

*Figures in parenthesis are percentage

Problems inhibiting farmers' participation in agricultural extension programme

Myriads of problems hinder farmers' participation in extension programmes as indicated in Table 3. Ranked as most serious by famers were poor involvement of people at the conception stage ($\bar{x}$ =3.25), lack of continuity ($\bar{x}$ =3.20), inadequate training ($\bar{x}$ =3.17), and inadequate extension agent ($\bar{x}$ =3.10). People's involvement can be enhanced with good leadership. Puhazhendhi and Jayaraman (1999) found that lack of effective leadership, and less/non-involvement of NGOs as negative factors that influence group participation. They also found increased rate of saving, regularity in attending meetings, and regular attendance as major contributing factors for good participation.

Table 3: Factors hindering farmers' participation in extension intervention programmes

S/No	Factors hindering participation	Very serious (4)	Serious (3)	Less serious (2)	Not serious (1)	Weighted sum	Weighted mean	Overall rating	Rank
1	Poor involvement of people at the conception stage	346 (57.7)	117 (19.5)	80 (13.3)	57 (9.5)	1926	3.25	Serious	1st
2	Lack of programme continuity	311 (51.8)	127 (21.2)	133 (22.2)	29 (4.8)	1920	3.20	Serious	2nd
3	Inadequate training	302 (50.3)	162 (27)	77 (12.8)	59 (9.8)	1907	3.17	Serious	3rd
4	Extension agent factors (inadequacy etc)	285 (47.5)	154 (25.7)	101 (16.8)	60 (10)	1864	3.10	Serious	4th
5	Extension agency factors	263 (43.8)	161 (26.8)	98 (16.3)	78 (13)	1809	3.02	Serious	5th
6	Poverty associated problems	260 (43.3)	128 (21.3)	95 (15.8)	117 (19.5)	1731	2.89	Serious	6th
7	Socio-psychological factors; and decision-making process	271 (45.2)	102 (17)	93 (15.5)	134 (22.3)	1710	2.85	Serious	7th
8	Institutional factors (stake-holders e.g. input, market	248 (41.3)	127 (21.2)	91 (15.2)	134 (22.3)	1689	2.82	Serious	8th
9	Participants' heterogeneity factors e.g. age, knowledge, level of education, status etc	242 (40.3)	124 (20.7)	104 (17.3)	130 (21.7)	1678	2.80	Serious	9th
10	Low rate of annual saving	243 (40.5)	103 (17.2)	130 (21.7)	124 (20.7)	1665	2.78	Serious	10th
11	Community factors e.g. power structure, leadership, economic level etc.	219 (36.5)	152 (25.3)	94 (15.7)	135 (22.5)	1655	2.76	Serious	11th
12	Environmental factors	177 (29.5)	104 (17.3)	87 (14.5)	232 (38.7)	1426	2.38	Not serious	12th
13	Non-involvement of NGO	184 (30.7)	64 (10.7)	48 (8)	304 (50.7)	1328	2.21	Not Serious	13th
14	Irregularity in meeting	162 (27)	74 (12.3)	39 (6.5)	325 (54.2)	1169	1.95	Not serious	14th
15	Irregular attendance by members	163 (27.2)	25 (4.2)	21 (3.5)	391 (65.2)	1160	1.93	Serious	15th

Source: Field survey, 2009. *Figures in parenthesis are percentages

Relationship between socio-economic characteristics and level of participation by farmers

Results of inferential statistical analysis in Table 4 indicate that there was a positive and significant relationship between farmers' level of participation and education (X^2=6.92; $p<0.05$), membership of farmers' association (X^2 =6.18; $p<0.05$), age (X^2=6.12; $p<0.05$), farming experience (X^2 =5.64; $p<0.05$), income (X^2 =4.61; $p<0.05$), and benefits of association membership (X^2 =3.41; $p<0.05$) and secondary occupation (X^2 =3.13; $p<0.05$). This means that the above characteristics influence farmers' ability and level of participation. Enhanced education, income, long years of experience and membership of farmers' association could have encouraged saving and a receptive attitude which could in turn encourage their participation. These findings conform with Olaniyi, Siyanbola and Eniola (2004) who found that age and education had significant relationship with level of participation. Also, Musa, Tafida and Gloria (2009) found land tenure, poverty, inadequate extension agents and poor inputs as serious constraints (in their respective order) to farmers' active participation in extension intervention programmes.

Table 4: Relationship between socio-economic characteristics and level of participation by farmers

S/N	Variable	X^2	df	Contingency	% level of significance	Decision
1	Age	6.12	2	0.32*	0.072	S
2	Gender	0.69	1	0.11	0.263	NS
3	Marital status	0.53	2	0.36	0.746	NS
4	Household size	0.95	2	0.16	0.825	NS
5	Education	6.92	1	0.93*	0.834	S
6	Farming enterprise	0.65	3	0.47	0.673	NS
7	Secondary occupation	3.13	4	0.54*	0.725	S
8	Farming experience	5.64	3	0.49*	0.362	S
9	Membership of farmers' association	6.18	3	0.51*	0.420	S
10	Income	4.61	4	0.56*	0.421	S
11	Farm size	2.01	2	0.31	0,572	NS
12	Benefits of association membership	3.41	2	0.32*	0.321	S

*Significance

CONCLUSION AND RECOMMENDATIONS

Farmers in the study area participate poorly in extension intervention programmes. Poor involvement of people at the conception stage, lack of continuity, inadequate training, inadequate extension agent, extension agency factors, poverty, socio-psychological factors, institutional factors, participants' heterogeneity factors (e.g. age, knowledge, level of education, status etc), low rate of annual savings, and community factors (e.g. power structure, economic level) were the major hindrance against their participation.

In view of these findings, a shift in the traditional supply-driven extension to a more participatory one becomes very necessary. Adult education which should emphasis the importance of participation should be encouraged. Cooperative attitude should also be inculcated in the farmers through trainings and experiences. These will no doubt ensure a high level of farmers' participation. This will ensure sustainability of extension programme and consequently guarantee the attainment of food security in Nigeria.

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Challenges facing rural dwellers' participation in community-based agriculture and rural development project in Gombe state

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Abstract

Studies have affirmed the effectiveness of community based development project in helping rural dwellers improve their socio-economic status. However, both internal and external forces do pose challenges to beneficiaries' participation in any development project. Hence this study focused on the challenges facing rural dwellers' participation in community-based agriculture and rural development projects in Gombe state, Nigeria. Multistage sampling technique was used to sample 71 respondents from 3 selected Rural Village Areas (RVAs). The results show that 36.6% of the respondents were between age 41 and 50, 31.0% between 31 and 40, and 11.3% below 31years (mean=43.7). Of all the respondents, female were 50.7%, 94.4% married and 78.9% educated. Majority of the respondents (69.0%) were farmers and 67.6% earned below mean income of ₦14,711.27. Only 3 of the 8 identified challenges had means above overall mean (Mean=1.13). No significant relationship existed between participation and sex (χ^2=0.014, $p < 0.05$), age (r= 0.129, $p < 0.284$). However, significant relationship existed between participation and marital status (χ^2=55.901, $p < 0.05$), education (χ^2=26.070, $p < 0.05$), source of income (χ^2=76.324, $p < 0.05$), household (r= 0.370, $p < 0.01$) and monthly income (r= 0.129, $p < 0.01$). There was no significant relationship between challenges faced and participation in community-based agriculture and rural development project activities (r=0.068, $p < 0.996$). In conclusion, the challenges were not yet serious on participation. However, issues of delayed implementation, unfulfilled promise and finance, with scores above means should be addressed by the development agencies as they can affect participation.

Keywords: Challenge, Participation, Rural dwellers, Community-based project

INTRODUCTION

Community-based development is a form of development that takes place within the community, emphasises maximum participation of community members in its design and implementation, is ongoing, meets real needs, and is basically self-reliant. It requires that the community have a structure, and persons trained in appropriate methods of implementation. Usually, community-based development is small-scale, low-cost, and uses simple technologies. According to IFAD (2007) the community based development projects help build capacity and strengthen institutions providing services to rural poor people, assisting with necessary policy changes, developing local organizations to enhance their effective participation, and promoting initiatives to foster rapid private sector-led poverty reduction and economic growth. For community-based development to occur people must adopt a new attitude, in which they become actors rather than recipients, and embrace small incremental change generated internally rather than expect large infusions of external wealth and technology. Hence community-based development encompasses forms of development as well as the structures needed to achieve them: it is biased in favour of participatory, community-controlled method such as that employed by African Development Bank Community Based Agriculture and Rural Development Project (AfDB-CBARDP).

Rural infrastructure plays a very significant role in enhancing agricultural production and produce marketing (Jacoby, 2000; Inoni, 2008;

Munonye, 2008). For example, road network and marketing facilities accelerate efficient delivery of farm inputs, reduce transport cost, and enhance special agricultural production and distribution. Investment in rural infrastructure have resulted in phenomenal growth in agricultural production and productivity, while rapid growth in agricultural productivity has led to significant trickle down benefit for the rural poor in some countries like India (Binswanger *et. al.* 1993; Fan *et. al.*, 2000).

Rural development is a conscious, deliberate and planned effort of the rural people and or the government to improve the economic, social, political and cultural conditions of the rural communities. According to Ekong (2003) rural development can be described as a process by which a set of technical, social, cultural and institutional measures are implemented with and for the inhabitants of rural areas with the aim of improving their socio-economic conditions in order to achieve harmony and balance both on the regional and national levels. The need for development in rural areas is one of the dominant issues of concern in today's world. The realisation that no meaningful national development programme would produce desired results at the expense of rural development has been the basis for implementation of one rural development or the other (Olatunji and Unamma, 2008). A viable rural development, however, can only be achieved when there is sustained growth in rural income and standard of living. Agricultural development is an important requirement for economic development of a society (Falusi, 1997). It enables farmers to increase their incomes,

investment, improve their standard of living and reduce poverty, as more funds become available for development projects like education, health, manufacturing, roads construction/rehabilitation, and communication. It helps to transform life of the people who constitute the society. One of the reasons attributed to the low growth of the Nigerian economy is the slow growth of the agricultural sector, which is characterised by rising food prices, more food import and inadequate raw materials (CBN, 1999).

Hence if community-based agriculture and rural development project is properly planned and executed with full participation of the beneficiaries, it will improve the rural dwellers' socio-economic status. Considering this need for active participation of beneficiaries, IFAD and AfDB through their community-based poverty reduction initiatives undertake projects of community development in collaboration with Nigeria Government. Among such rural community development projects of Africa Development Bank in Nigeria is the Community-Based Agriculture and Rural Development Project (CBARDP).

The term participation implies voluntary joint activities of people in those political, economic and social activities which affect their lives (Adisa and Jibowo, 2004). People's participation is a political process in which previously excluded class, or group seek to become involved, have a voice in and generally gain access to the benefits of economic and social development. According to Torimiro and Laogun (2000), participation in rural development activities is a way to empower rural dwellers and accommodate their view for policy formulation through cooperative efforts in rural development. One can viewed participation as the active process in which the person in question takes part in the initiation and implementation of decisions. It also includes cooperative financing of projects with the governments. Participation is an action of individuals that enables him/her to have input into the decision-making process and play significant roles in improving the quality of lives of his/her community people by taking part in the initiation and implementation of the decision(s) and cooperative funding of the project/programme.

However, many attempts at expected community participation failed because organisations promoting involvement are unclear about the level of participation on offer (Joseph Rowntree Foundation – JRF, 1994). Brown *et al* (2002) found that community driven development project that lacked external institutional, finance, and technical support were not sustainable. According to Hussain (2009) community members' differences and power relationships, the conflicts, and the diversity of interests determine day to day behaviour and have impact on the effectiveness of participatory approach. Similarly, Olumodeji *et al.*

(2006) observed nine challenges facing people participating in community development which include finance, lack of cooperation among participants, lack of interest and poor communication to the participants. There is no doubt that these challenges can reduce effective participation; but if identified and addressed promptly they might be overcome successfully. Therefore, this study aimed at finding out the challenges facing rural dwellers participating in community-based agriculture and rural development projects in Gombe state.

The specific objectives were to:
i. determine the personal characteristics of the respondents
ii. identify the challenges of participation in community-based agriculture and rural development projects
iii. assess the respondent's level of participation in community-based agriculture and rural development projects

METHODOLOGY
Sampling and methods of data collection

The study was carried out using multistage sampling technique. Simple random sampling technique was used to select three of the nine participating Local Government Areas (LGAs). One Rural Village Area (RVA) was selected from each of the three RVAs in the three LGAs. Simple random technique was used to select 5% of the registered participants from the three RVAs; 35 from Kembu, 21 from Lamugu and 15 from Kwami RVA. In all 71 respondents were used for the study.

Structured interview schedule was used to collect quantitative data for the study. Enumerators, who understand the local languages very well, were trained to assist in administering the instruments on the target population. It was necessary to use enumerators, not only to hasten the work but to allow the respondents express themselves in their local languages.

Measurement of variables
Level of participation in the community-based development project: Respondents were asked to indicate their participation in 84 activities under three major components which were agricultural development, infrastructural development and capacity building components. They were to indicate the frequency of their participation whether always, occasionally or seldom. Scoring was done as follows: Always=3, Occasionally=2, and Seldom=1; Total score = 252. Means score was calculated to categorise the level of participation to low participation and high participation.
Challenges facing rural dwellers in AfDB-CBARDP: Respondents were asked to state the problem against their participation in AfDB-CBARDP

RESULTS AND DISCUSSION
Personal characteristics

Result on age in table 1 shows that 36.6% of the respondents were between 41 and 50, 31.0% between 31 and 40, and 11.3% below 31years (□=43.7years). The result reveals that majority of the respondents were within the mean age and below from where inference can be drawn that majority of the respondents were working class and matured. According to Obeta and Nwagbo (1999), younger farmers are more flexible to new ideas and risks; hence they are expected to embrace the community-based project introduced to them.

Female were more than male (50.7%) against (49.3%) as shown in table 1. It is not in all studies consisting of male and female that male is more in percentage. Adeogun and Oluyole (2004) discovered more female farmers than male in a technology adoption study. For this study, possibility of more female than male arose because female were encouraged more to participate in the project as the most venerable group that needs to be more empowered (Abdullahi, 2006).

The findings of this study reveal that 94.4% of the respondents were married while the remaining 5.6% were widow (table 1). The result corroborated Tologbose and Adekunle (2000) who observed that 98.5% were married among rural farmers in Benue. Marital status may become an important factor in agricultural production especially when farm labour supply is limited. Marital status is a social symbol which attracts prestige among rural dwellers.

Table 1 shows that 64.8% had household size of more than 7 persons, 28.2% 4 – 6 persons while 7.0% of the respondents had household size of 1 – 3 persons (□=9.93 ± 8.36). Based on the findings, it can be inferred that large family size was common in the study area, where most of the families were larger than 7 persons. The result is also in line with the 2006 population reports, which specify the average family size of greater than 8 persons for both Gombe state. Large family size is a valuable resource in rural communities because household members are good source of farm labour unlike in the urban areas where it is seen as a burden.

Appreciable number of the respondents (78.9%) acquired one form of education or the other (table 1). It can therefore, be inferred that majority of the respondents are literate. According to Hussain (2009), respondents' attained educational status is expected to influence positive growth and development of their society. Hence the respondents' attained educational status is expected to influence positive change in the community.

The major source of income of the respondents as shown in table 1 reveals that 69.0% of the respondents indicated farming as their major source of income. Other sources of income include trading (18.3%), civil service (8.5%) and Artisan (4.2%). The result is in line with the assertion of Falusi and Adeleye (2000) that agriculture engages about 75% of people in most developing nations.

Mean income of the respondents was ₦14,711.27 (table 1). Consequently, respondents with income less than mean were low income earners. The result shows that 67.6% of the respondents earned within and below mean income from all their income generating activities. This result is different from the observation of Imoh (2004) who reported that majority of the respondents were within the range of ₦1,000 and ₦3,999. The difference is possible because the value of Nigerian naira is less now compared to what was obtained in 2004.

Table 1: Respondent's personal characteristics

Variables	Frequency	Percentage	Mean	SD
Age years				
< 31	8	11.3		
31 – 40	22	31.0		
41 – 50	26	36.6	43.72	10.37
51 – 60	11	15.5		
61 and above	4	5.6		
Sex				
Male	35	49.3		
Female	36	50.7		
Marital status				
Married	67	94.4		
Widowed	4	5.6		
Household size (persons)				
1 – 3	5	7.0		
4 – 6	20	28.2	9.93	8.36
7 and above	46	64.8		
Attained education				
No education	15	21.1		
Primary education	36	50.7		
Secondary education	11	15.5		

Variables	Frequency	Percentage	Mean	SD
Tertiary education	9	12.7		
Primary source of income				
Farming	49	69		
Civil service	6	8.5		
Trading	13	18.3		
Artisan	3	4.2		
Monthly income (₦)				
< 7,500	20	28.2		
7,500-10000	11	15.5		
10,001-15000	17	23.9	14,711.27	9,602.70
15001-20000	8	11.3		
Above 20000	15	21.1		

Source: Field survey (2011)

Respondent's Farming information

The result of the respondents' farming experience presented in table 2 reveals that majority of the respondents (>53%) had been farming for at least 22 years (mean=22.06). The result corroborated the observation of Adeogun and Oluyole (2004); and Ndanitsa and Umar (2008) who reported in similar studies that majority of respondents were above 11 years in farming business. Since majority of the respondents were experienced farmers, it would be easy for them to detect any change brought into their business by the project. Hence their participation will be further enhanced.

Table 2 shows that majority (52.1%) had farm size of between 0.1 – 2 ha, 22.5 % 2.1 – 4 ha, 15.5% 4.1 – 6 ha, while 9.9% had above 6ha ($\bar{x}$=3.25 ± 3.55). It can be inferred from the result that majority of the respondents were small scale farmers. This result is different from what Tologbose and Adekunle (2000) observed that majority of the rural farmers in Benue had less than 1ha of farm land. The difference in observation is possible because the vegetation of the two studies are not similar as that of Gombe allows opening of large area of land for farming.

Table 2 shows that 60.6% of the respondent had high utilisation of information sources. To achieve both agriculture and rural development, there must be proper and efficient ways of exchanging and sharing information, skill and knowledge to and among rural dwellers. According to Agbontale *et al*. (2008) knowledge and information are important factors for accelerating agricultural development by increasing agricultural production and improving marketing and distribution.

Majority of the respondents (70.4%) had access to market as shown in table 2. Only 29.6% of the respondents had no access to market. This is an indication that there is no problem in disposal of farm produce in the study area. Marketing is very important when considering production, including agricultural production. It is the performance of business activities that direct the flow of goods and services from producers to consumers or final user. In agricultural marketing, the point of production is the basic source of supply. The marketing process begins at that point and continues until a consumer buys the product at the retail counter or until it is purchased as a raw material for another production phase (Johnson, 1985). Hence, for economic development, it is important to raise farming output but equally important to develop marketing so that the extra production reaches consumers efficiently.

Table 2: Respondent's Farming information

Variables	Frequency	Percentage	Mean	SD
Farming experience (years)				
0	4	5.6		
1-10	6	8.5	22.06	10.59
11-20	28	39.4		
21-30	22	31.0		
31 and above	11	15.5		
Farm size (ha)				
0	4	5.6		
0.1-2	33	46.5	3.25	3.55
2.1-4	16	22.5		
4.1-6	11	15.5		
Above 6	7	9.9		
Information utilization				
Low (Below mean)	28	39.4		
High (Mean and above)	43	60.6	10.79	1.51

Variables	Frequency	Percentage	Mean	SD
Access to market				
Have access	50	70.4		
Have no access	21	29.6		

Source: Field survey (2011)

Respondents' level of participating in community-based development

Table 3 shows that 52.1% of the respondents participated in the community-based development activities at low level with the score below mean of 42.38. The result corroborated the observation of Adegboye *et al* (2009) who reported in similar studies that level of rural dwellers' participation in development project was low.

Table 3: Respondents' level of participating in community-based development

Participation levels	Frequency	Percentage
Low (12-42)	37	52.1
Average (43)	2	2.8
High (44-100)	32	45.1
Total	71	100.0

Mean=42.38
Source: Field survey (2011)

Challenges facing rural dwellers participating in community-based development

Challenges facing rural dwellers participating in community-based agriculture and rural development activities as identified by the respondents are shown in table 4 below. Eight challenges with mean score of 1.13 were identified. Only three of the challenges had means above the overall mean. These were delayed implementation (1.28), unfulfilled promise (1.15) and finance (1.35). It can be inferred from the result that the challenges identified by the respondents were not yet serious ones. Hence, the challenges are not expected to hinder the achievement of the project's goal unless allowed to become serious challenges.

Table 4: Challenges facing rural dwellers participating in community-based development

Challenges faced	Yes	No	Mean
Delayed implementation	20(28.2)*	51(71.8)*	1.28
Unfulfilled promise	11(15.5)	60(84.5)	1.15
Poor infrastructure	2(2.8)	69(97.2)	1.03
Finance	25(35.2)	46(64.8)	1.35
Insufficient items	8(11.3)	63(88.7)	1.11
Poor communication	3(4.2)	68(95.8)	1.04
Leadership problem	1(1.4)	70(98.6)	1.01
Lack of cooperation	2(2.8)	69(97.2)	1.03

*Percentage in parenthesis
Mean=1.13
Source: Field survey (2011)

Relationship between personal characteristics of rural dwellers and participation in community-based development project activities

Test of relationship between personal characteristics (sex, marital status, education, source of income, age, household size and monthly income) and participation of rural dwellers in the study area was determined by use of Chi-square (χ^2) and PPMC; the result is as showed in table 4 below.

The result show that sex of the respondents has no significant relationship with their participation (χ^2=0.014, p < 0.05). This is an indication that the participation of the male is not better than that of their female counterparts in the study. Hence as the male needs the community-based development project, the female also needs it towards improvement in their socio-economic status.

However, the result shows that marital status of the respondents contributed significantly to their participation (χ^2=55.901, p < 0.05). Similarly, the result shows that level of education of the respondents contributed significantly to their participation (χ^2=26.070, p < 0.05). This means that the level of education of the respondents related to participation. That is, the higher the educational attainment of a respondent, the higher his or her participation in the community-based agric and rural development project activities. Also, the result shows that respondent's source of income contributed significantly to their participation (χ^2=76.324, p < 0.05).

The result further indicates that respondent's age had no relationship with participation (r= 0.129, p < 0.284). However, relationship existed between respondents' household (r= 0.370, p < 0.01) and monthly income (r= 0.129, p < 0.01), and participation in community-based agriculture and rural development project activities.

Table 4: Relationship between personal characteristics of rural dwellers and participation in community-based development project activities

Variables	df	χ^2 Cal.	p-value	Decision
Sex	1	0.014^	0.906	Not significant
Marital status	1	55.901*	0.000	Significant
Education	3	26.070*	0.000	Significant
Major source of income	3	76.324*	0.000	Significant
Variables		**r -value**	**p –value**	**Decision**
Age		0.129^	0.284	Not significant
Household size		0.370**	0.001	Significant
Monthly income		0.393**	0.001	Significant

*Chi-square is significant at p<0.05
^ Chi-square is not significant at p<0.05
** Correlation is significant at the 0.01 level (2-tailed)
Source: Field survey (2011)

Table 5: Relationship between challenges facing rural dwellers and participation in community-based development project activities

The result in table 5 shows that there is no significant relationship between challenges faced and participation in community-based agriculture and rural development project activities (r=0.068, p < 0.996). This implies that the challenges were not so serious to reduce participation. However, it does not mean that the challenges should be left unattended to until they are aggravated.

Variable	N	r-Value	p-Value	Decision
Challenges and participation in community-based development project	71	0.068	0.996	Not significant

Source: Field survey (2011)

CONCLUSION

Based on these findings, it can be inferred that majority of the respondents were working class and matured as the mean age was 43.7years, and majority of the respondents were within the mean age and below. Female were found to be participating more than the male. This is a positive development as are often the most venerable group that needs empowerment. Similarly, almost all the respondents were married. Based on the findings, it can be inferred that large family size was common in the study area. Majority of the respondents acquired one form of education or the other. Also, many of the respondents were farmers. Mean income was ₦14,711.27 and majority of the respondents earned within and below mean income from all their income generating activities. Majority of the respondents had been farming for at least 22 years, had farm size of between 0.1 – 2 ha and had high utilisation of information sources. Similarly, majority of the respondents had access to market which is an indication that there is no problem in disposal of farm produce in the study area.

Only three of the challenges, which were delayed implementation, unfulfilled promise and finance, had means above the overall mean. No relationship was discovered between sex and participation but relationship existed between marital status, education, source of income, household size and income, and participation in community-based agriculture and rural development project. Observation from the study also reveals that the challenge faced by respondents had no relationship with participation in community-based agriculture and rural development project activities.

RECOMMENDATIONS

From the conclusion, the following are recommended:

(i) Financial support should be given to the rural dwellers towards their active participation in any development project as many of them were low income earners.

(ii) The three most important challenges identified by the respondents, delayed implementation, unfulfilled promise and finance, should be addressed by the development agencies as they can affect participation.

(iii) Marital status, education, source of income, household size and income should be well considered in planning subsequent

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development projects since they were discovered to have relationship with participation.

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Microfinance banks and agro-allied small and medium scale enterprises in Ogun State, Nigeria: Prospect, performance and constraints

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Abstract

Microfinance bank (MB) is currently being promoted as a key development strategy for promoting poverty eradication and economic empowerment in Nigeria. Based on this, the study examined the prospect, performance and factors affecting the financing of ASMSE by MB in Ogun State Nigeria. The entire five microfinance banks in Ijebu North Local Government Area (INLGA) of Ogun State, were used for the study. Data were collected through structured questionnaires and interview schedule. The data were analyzed using descriptive statistics such as bar chart, pie charts, frequency distribution and percentage. Results revealed that the loan schemes operated by MB differ from one bank to another. The loan schemes include micro-credit, agricultural production loan, trade and transport loan, small and medium enterprise credit, bulk purchase finance, overdraft facility, and equipment leasing. The study also revealed that MB through their various activities had affected operators' productivity positively while some ASMSE are not favoured by MB due to some factors such as long payback period and low rate of return. However, microfinance banks interest rate and loan duration period are major constraints to ASMSE operators in procuring loan. The main factor affecting MB's loan availability to agro-allied sub-sector was the type of enterprises embarked upon (fish farming, poultry production and piggery in that order) while food crops and tree crops enterprises were not favoured. The study concluded that sustained holistic government policies on microfinance would increase the ample scope for mobilizing micro savings and thus consequently increasing the productivity of ASMSE operators.

Keywords: Agro-allied, Small and medium scale enterprises, Microfinance banks

INTRODUCTION

Agriculture in Nigeria and in most developing economies still manifests most of the typical symptoms of peasant agriculture. Some of these symptoms include use of farm inputs that are mainly land and labour, small farm holdings and subsistence production and small capital investment (Famoriyo, 1984). Other variables that characterized agricultural enterprise in this region include, inadequacy of extension services, inadequate credit to meet the financial needs of farmers, inadequacy of storage facilities, seasonal fluctuation and instability of prices, over exposure of risk and natural hazards, rudimentary technology that has kept pace with the demand of the sector, inability of research effort to tackle immediate and future needs of farmers (Famoriyo and Nwegbo 1981). However, inadequate access to credit has been identified as critical factor facing the smallholders in Nigeria (Olieh, 1980, Olomola, 1990). The major challenge to the funding of agriculture in Nigeria is that farmers have relied mainly on personal finance especially from personal savings and borrowing from friends and relations in the absence of institutional finance sources. These funding sources are usually not reliable and the amount of fund available is rather limited relative to their needs. Institutional financing sources such as banks and government initiative have remained inaccessible to the farmers, for reasons of administrative encumbrances, unwillingness on the part of banks to grant agricultural loans, and lack of political will of government to ensure successful financing of

agriculture through their various agencies and initiatives. The government's realization of these problems led to the creation of specific programmes such as the Agricultural Credit Guarantee Scheme (ACGS), the Nigeria Agricultural Cooperative and Rural Development Bank (NACRDB), sectoral loan allocation, rural banking scheme for commercial banks, establishment of Microfinance banks, encouraging the formation of farmers' cooperative societies. Additional to these, federal, state and local governments make annual budgetary allocations for financing various agricultural programmes basically to boost agricultural production and productivity. The failure of pervious attempts at extending financial resources (credit) to rural producers motivated the introduction of community banking system in January 1990 (Now Microfinance bank) in Nigeria.

Finance is a major input for the transformation of the agricultural sector particularly in developing countries that are dependent on agriculture and its provision determines access to essential farm and production inputs. Credit for the smallholder, especially in agriculture, is assuming increasing importance in many parts of the world in response to the needs of less privileged entrepreneur with limited capital base (IFAD, 2001). Financing of agricultural sector by microfinance banks involves the extension of credit or loan from microfinance bank to farmers/producers (both the small and large scale farmers) in order to improve greatly in their agricultural production practices. Microfinance bank is currently being promoted as a key

development strategy for promoting poverty eradication and economic empowerment. It has the potential to effectively grant financial services to households who are not served by the formal banking sector. Commercial banks traditionally lend to medium and large enterprises which are judged to be creditworthy with little regard to micro enterprises because the associated cost and risks are considered to be relatively high. Microfinance banks have therefore become the main source of funding micro enterprises in Africa and in other developing regions (Iganiga 2008).

Kimotha, (2005) defined microfinance simply as the provision of very small loans (micro credit) to the poor, to help them engage in new productive business activities and/or to grow/ expand existing ones. However, overtime, microfinance has come to include a broader range of services. These include mainly credit, savings opportunities, insurance and money transfer, as practitioners came to realize that the poor, who lacked access to traditional formal financial institution, needed and required a variety of financial products to achieve meaningful improvement in their business activities. While microfinance refers to loans, savings opportunities, insurance, money transfers and other financial products targeted at the poor, micro-credit refers specially to small loans. The average loan size varies from country to country. Microfinance is acknowledged as one of the prime strategies to achieve the Millennium Development Goals (MDGs). Access to sustainable financial services enables owners of micro enterprises to finance income, build assets (Haddad et al., 1997) and reduce their vulnerability to external shocks. Access to financial services enables poor households to move from everyday for survival to planning for the future, investing in better nutrition, their children's education and health and empowering women socially (Ehigiamusoe, 2005). The use of microfinance as a major strategy for poverty reduction in developing countries, which includes Nigeria, is increasingly being perceived as an effective tool for rural poverty reduction among the farmers. Indeed, microfinance has become one of the crucial driving mechanisms towards achieving the Millennium Development Goals (MDGs), especially concerning the target of halving extreme poverty and hunger by 2015 (Fernando, 2004).

Microfinance bank are supposed to play significant role in the development of the nation's economy especially in the area of providing credits , deposits and other financial services to community members especially farmers for agricultural and economic pursuits. They are placed in a better position than other credit (financial) sources because they give soft loans on the basis of member's self recognition and credit worthiness under favourable condition and enforce repayment as scheduled. An investigation into the financing of agricultural production in the study area will lead to the knowledge of whether microfinance banks in the study area are performing their primary objectives in financing or not. It will also lead to the identification of the factors that are hindering farmers from getting enough financing resources from Microfinance banks.

The problems therefore is that, it is not known if enough credits/loans is being given out to members for agricultural production pursuits, to what degree have funding from microfinance banks been devoted to agriculture, if farmers actually use such credits/ loans collected for proposed projects, and how often do they repay such loans at the due date. It is against this backdrop that the study aims to investigate the prospect, performance and constraints of microfinance banks in relation to agro-allied small and medium scale enterprises in Ijebu-North Local Government Area of Ogun State.

METHODOLOGY

The study was conducted in Ijebu-North Local Government Area (INLGA) of Ogun State, Nigeria. The INLGA is located between latitude 6^0 55^1 and 7^0N and between longitude 3^0 45^1 and 4_0 05^1E. The study area is one of the six local government areas that form Ijebu division of Ogun State. The economic activities of the people of the division vary from farming to trading and civil service, with farming being the most dominant activity. The conductive climatic condition and physical environment have been generally supportive to farming as reflected in the variety and quantity of crops grown in the area. Common crops like maize, rice, cassava, yam, palm kernel are grown in the areas with sizable number of agro-allied industries. Operators of the entire five microfinance banks in Ijebu North Local Government Area (INLGA) of Ogun State, Nigeria were used for the study. Data were collected through structured questionnaires and interview schedule. The data were analyzed using descriptive statistics such as bar chart, pie charts, frequency distribution and percentage.

RESULTS AND DISCUSSION
Loan schemes operated by microfinance banks
From the result as revealed in table 1, microfinance banks in the study area operated different types of loan scheme. Specifically, the loan scheme covered micro credit (22.7%), overdraft (18.2%), credit to SMEs (18.2%) and customers involved in bulk purchases (9.1%). Others areas of interest od the MB included micro credit to daily contributors (9.1%), equipment leasing operators (9.1%) and civil servants (13.6%). Going by the categories of enterprises and people covered, the result is indicative of MB operations targeted at the poor. It therefore gives credence to the fact that microfinance has the capacity to reduce poverty by

providing efficient, effective and sustainable financial services to poor households who are otherwise excluded from the formal banking system for lack of collateral. However, the availability of the various credit services in the banks does not mean that all categories of people, particularly the farmers have access to them. Banks' preference is an important factor that determines the usage of available facilities. Table 1 shows the banking

services in percentages as preferred by the microfinance banks. The table reveals that the banks preferred microcredit service (22.7%). This may be due to the fact that the service tends to give them the highest rate of return as against bulk purchase service, daily contribution and equipment leasing facilities, each of which accounted for 9.1% that were less preferred.

Table 1: Preference of services by microfinance banks

Loan Schemes	Percentage
Micro Credit	22.7
SME Loan	18.2
Bulk purchase	9.1
Overdraft	18.2
Equipment leasing	9.1
Civil Service	13.6
Daily Contribution	9.1
Total	100

Source**:** field survey, 2009.

Sources of funds available to microfinance banks

Figure 1 reveals microfinance banks generate their funds from four various sources besides their owners' capital outlay. The four sources are Central Bank of Nigeria, Commercial Banks, members deposits and other sources. From the graph, members' deposit remained the main

source of fund with a value of 49.1%. This may be due to the fact that members deposits perhaps remain the only source of fund that comes from efforts of employed staff members of MB who work on target for the banks. Fund from CBN and commercial banks attract interest rates, which may not favour the MB.
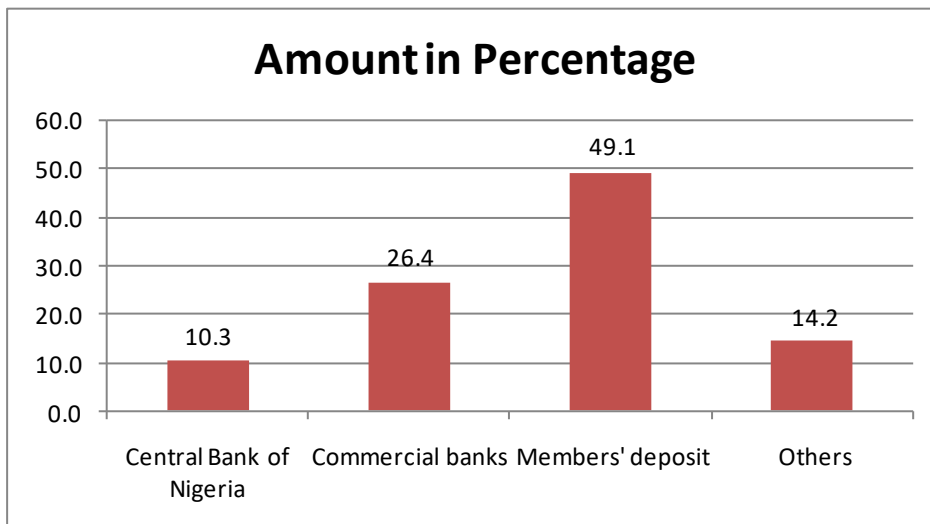

Figure 1: Sources of funds available to microfinance banks

Microfinance banks performance

The loan performance of the microfinance banks were assessed based on the level of loan application, amount granted, repaid and the amount defaulted. The study revealed improved performance from 2007 to 2008 in terms of amount repaid and amount defaulted as shown in Figure 2. The figure revealed that there was about 12% decrease in the amount defaulted from 2007 to 2008 while the amount repaid rose from about 10% within

the same period. However, the amount granted reduced by about 8%. The various factors affecting the performance of microfinance banks in grating loan to investors were examined. The factors identified are interest rate, loan duration, preference to agricultural enterprise, poor working capital, protocol and bureaucracy among others. The implications of these socio-economic factors on the development of agriculture are discussed.

1. In other for the microfinance banks to meet up with their economic goal of profit making; they raise their interest rate which is so exorbitant for peasant farmers who only work on small portion of land. The loan duration given by the microfinance banks are not suitable for some agricultural enterprises that span across 12 months. Most microfinance offers between 12% - 35% interest rate on 6 months and between 22% - 30% interest rate on 12 months loan duration. With these interest rates, small and medium scale investors would not be able to afford it, and if they applied the consequence will be high loan default. In addition, the loan duration is too short for some agricultural enterprises. High interest rates may reflect high default rates or high costs associated with screening and monitoring loans. At the same time, imperfect information may give rise to imperfect competition, thereby providing lenders an opportunity to exploit borrowers.

2. The preference that microfinance banks attached to various agricultural enterprises is a factor that also affects microfinance performance in the area of agriculture. The profitability index of the agricultural enterprise coupled with their rate of return and their yield duration are some of the factors used by microfinance banks to rate these agricultural enterprises before granting loan. Fish farming is ranked as the highest profitable farming enterprise followed by poultry and piggery business (Figure 3). Microfinance banks are reluctant to give loan to farmers practicing the less preferred agricultural enterprises.

3. The internal constraints that affect microfinance banks loan availability for agricultural production are bureaucracy, collateral assessment and poor working capital. Collateral assessment and poor working capital are the major internal problems that hinder the bank from effectively giving credit facilities to the agricultural sector. Borrowers will experience unnecessary delay in obtaining loan from the financial institution because of the internal constraints and this might affect the farmers production if the loans are not released as at when due.
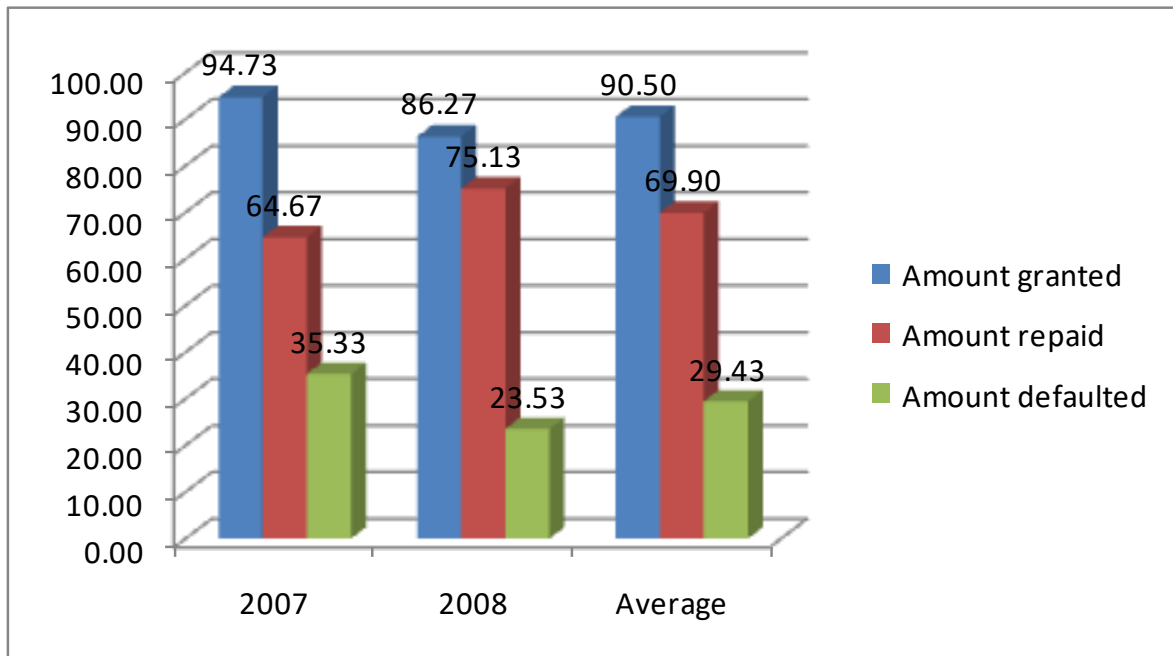

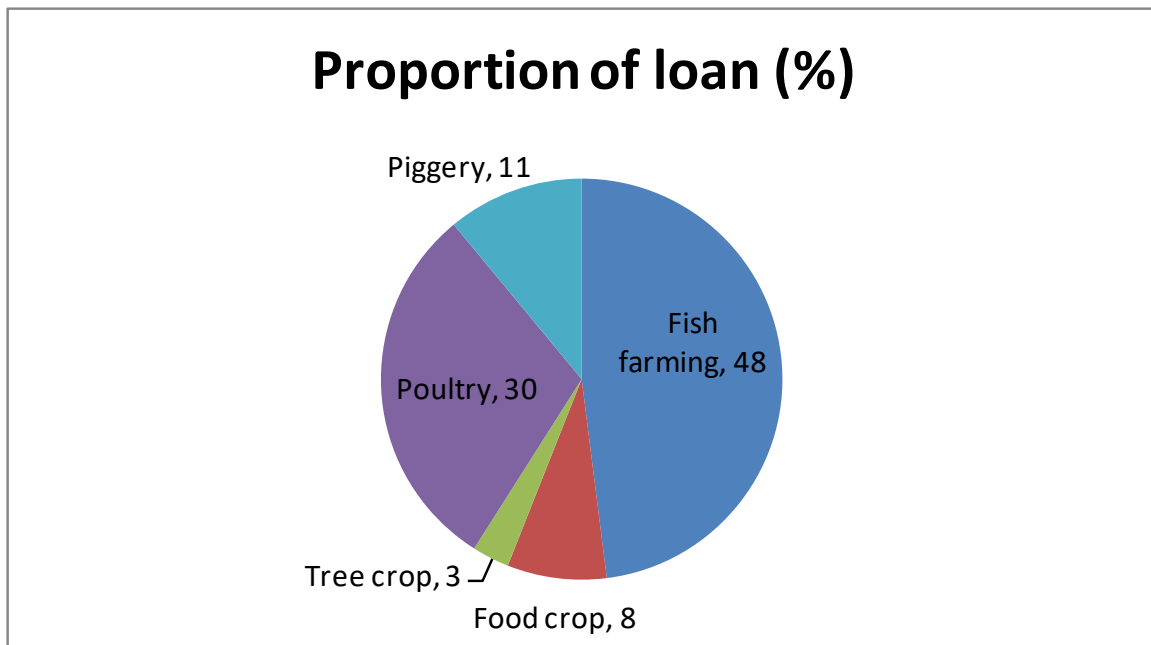Figure 2. Performance of microfinance banks (in percentage)

Proportion of loan (%)

Piggery, 11

Fish farming, 48

Poultry, 30

Tree crop, 3

Food crop, 8

Figure 3: Proportion of agricultural loan given to farming enterprise.

Constraints to agro-allied enterprise financing by microfinance banks

To achieve sustainable microfinancing, microfinance banks must address the following constraints.

1. In adequate awareness campaigns and supports by the regulators. This suggests that there is need for continuous campaigns to all stakeholders; investors, universal banks, the banking public, the micro targeted poor and low-medium scale entrepreneurs until the micro banking ideas sink in the society and gets well accepted.

2. Lack of smallholders' trust toward microfinance banks: From the antecedents of banking industry in Nigeria, small scale investors/farmers lack trust in financial institutions. They have the perception that microfinance banks are just like the unregulated community banks and finance houses. Only effective and far-reaching campaigns and exhibited trust in the microfinance banks by the government and the regulators can achieve this desirable confidence.

3. Poor buy-ins and competitive approaches by the State Governments and Local Governments. The policy direction towards the millennium development goals is that one percent of the annual votes of the State and Local Governments should be channelled to.

4. Government involvements in microfinance banking would be counterproductive as they should concern themselves with policy formulation and control rather than

implementation. Nigerian Microfinance banks have what it takes to manage micro funds for states and international bodies and should be given the chance to do so under strict supervision and controls.

5. De-marketing activities and unhealthy competition by the commercial banks: Some of these banks rather than complement the activities of microfinance banks for the general development of our country, discredit micro finance banks to the governments, donor agencies, investors and customers by painting pictures of instability, unsustainability, poor capitalization etc to the vulnerable micro-clients and potential investors.

6. Poor correspondence banking attitudes by correspondence banks: In view of the unhealthy competition rather than co-operation that should exist, correspondence banks are hardly supportive of Microfinance banks.

7. Poor structuring of some MFB's due to cheap inexperienced staff and poor operational facilities. The CBN needs to ensure that the minimum qualification and minimum experience specified for microfinance bank operators are upheld at all times. This is the only way industrial confidence and sanitization may be achieved.

Prospects and ways forward for result-oriented microfinance banks

The extent of poverty and the importance of the rural sector to the economy make it a pivotal for microfinance interventions. Poverty in Nigeria is

predominantly a rural phenomenon, and it is high among self-employed households cultivating agricultural crops, this serve as an indicator for microfinance bank prospects in Nigeria. Prevalence of micro business in Nigeria is also an indicator for the survival of Microfinance bank in Nigeria. Other less important indicators are savings habit, capital base, government regulation and grassroots operation. For effective and result oriented microfinancing, the following are proposed.

1. The built up SMEEIS reserves in universal banks should be invested in or through Microfinance banks as equity, seed funds or low interest loans for on-lending to the poor and SME's. The vision behind the creation of SMEEIS must not be allowed to die until the MDG goals are actualized in Nigeria.
2. Extensive campaigns should be carried by CBN and NDIC to assure the public that MFB's are highly regulated and safe banking institutions. This should engender the investor's interest and the active poor confidence in Micro banking.
3. Strengthening and streamlining of policy that redefines operational areas for universal banks such as both to protect the young MFB industry and strengthen their operations. The idea of State and local governments dealing with mega banks on the 1% micro banking funds for poverty alleviation seems counterproductive to the microfinance industry.
4. Minimum professional qualification and banking experience already instituted by the CBN for key micro bankers and directors should be strictly and stringently adhered to and maintained by the regulators.
5. Training and development functions of the MFB's for their staff and clients should be supported by the regulators and all strata of government as well as big brothers-the correspondence banks.

CONCLUSION

Microfinance banks through various activities could affect farmers' productivity. Some agricultural enterprises are not favoured by these microfinance banks due to some factors which among others are: production period, rate of return and the profitability index. Microfinance banks interest rate and loan duration period are major constraints to these farmers in procuring loan. One of the finance policies operated by the microfinance banks is to generate profit within a very short period in order to meet their shareholders demand and keep them in existence; however, this is not suitable for some agricultural enterprises. The existence of microfinance banks in increasing agricultural productivity is perceived as an effective tool in promoting agro-allied enterprises.

Based on the findings, the following recommendations are given:

1. Microfinance banks should ensure prompt approval and timely disbursement of loans to farmers. The duration of agricultural loan should be based on the time it will take for the project to mature.
2. Farmers should be educated and enlightened on the need to seek for external funding. This can be achieved by organizing seminars for the farmers. Here they are also educated on how to ensure the productive use of the loan they provide.
3. Microfinance bank should assist farmers in procuring agricultural inputs like improved seed varieties, fertilizer, insecticides/pesticides etc. i.e. give loans in kind so as to reduce possibility of cash loan diversion.
4. Microfinance banks should intensify their methods of loan supervision to ensure prompt repayment.
5. Government should review the interest rate downward for agricultural loan. This will encourage more farmers to apply for loan.
6. Government should ensure adequate funding of microfinance banks so that they will be able to meet their financial obligations to community members.

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