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**Rainwater Harvesting for Agriculture and Domestic Supply in Enugu
North Agricultural Zone, Nigeria**

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Abstract

The turning point for water resources development and management policy in Nigeria could be traced as far back as 1960 after the severe drought of the 1950s. In year 2000, the federal government formulated a new National Water Supply and Sanitation Policy. The study was designed to determine whether or not, a national policy on domestic rainwater harvesting is entrenched in the national water supply and sanitation policy. A case study was carried out in Enugu north agricultural zone of Enugu State. Data for the study were collected from 70 respondents through the use of a structured interview schedule. Frequency distribution, percentage and mean statistic were used in the analysis of the data. The findings revealed that there was an absence of national, state and local government's policy on domestic rainwater harvesting for agriculture and domestic supply in the study area unlike what is obtainable in other countries such as China, Brazil, Zimbabwe and India. It was recommended that the National Water Supply and Sanitation Policy in Nigeria should be reviewed to accommodate domestic rain water harvesting for agriculture and domestic supply.

1.0 Introduction

Water is the most precious natural resource and something that most people take for granted. Many are now increasingly becoming aware of the importance of water to their survival and its limited supply especially in the dry continents of the world (www.sustainable.com.au). It is a precious natural resource, vital for life, development and the environment. It can be a matter of life and death, depending on how it occurs and how it is managed. When it is too much or too little, it can bring destruction, misery or death. Irrespective of how it occurs, if properly managed, it can be an instrument for economic survival and growth. It can be an instrument for poverty alleviation in that it makes many people have access to safe water and sanitation, while at the same time, it brings prosperity to all as a result of its economic value (UN-WAER/AFRICE, 2004). However, when it is inadequate in either quantity or quality, it can be a limiting factor in poverty alleviation and economic recovery, resulting in poor health and low productivity, food insecurity and constrained economic development (Gbadegesin and Olorunfemi, 2003).

Domestic rainwater harvesting (DRWH) is a way of capturing rainwater when it rains. The captured water is stored above ground or underground and it is used later (www.akash-ganga-rwh.com). According to Gould (1992), DRWH is a technology(e.g. rooftop,landsurface, storage tank, rainwatercontainers) used mostly by rural dwellers for collecting and storing

water from rooftops, the land surface or rock catchments using common water collecting materials such as jars and pots as well as more complex materials such as underground check dams. The techniques usually found in Asia and Africa arose from practices employed by ancient civilizations within these regions and still serve as a major source of drinking water supply in rural areas. Among the known common DRWH techniques, the bamboo roofs are the least suitable because of possible health hazards. Similarly, roofs with metallic paints or other coatings are not recommended as they may impart tastes or colour to the collected water. Roof catchments should also be cleaned regularly to remove dust, leaves and bird droppings so as to maintain the quality of the product water (UNEP, 1982).

Rainwater harvesting provides drinking water and irrigation water, increases groundwater recharge, checks storm water discharges, urban floods and overloading of sewage treatment plants (www.india.org). Rainwater harvesting can save money. If one lives where annual rainfall averages one foot, one can save money by collecting and storing rainwater and using it to irrigate trees, shrubs and lawns; cooking and laundry (<http://aggiehorticulture.tamu.edu/mastergd.mg.html>). From China to Peru, Niger to Palestine, Afghanistan to Mexico and in many African countries, the effort to access water of adequate quality and quantity absorbs a major part of the daily official working hours and capital significantly, with serious security implications. In many of these countries, rainwater harvesting has helped in reducing the unnecessary tension due to water shortage. Millions of people, mainly women, harvest, collect and rainwater for the drinking, cooking and washing needs of their families (<http://www.irinnews.org/indepthmain.aspx>).

In many rural areas of different countries in the world, government agencies, non-governmental agencies, churches and community organizations are getting more and more involved in the concepts of DRWH and its efficient utilization for water security and sustainability currently, there are moves within non-governmental organisation(NGOs) and within government agencies to make rainwater harvesting more popular as a way of gaining water for domestic and agricultural use. The technique has particular relevance where ground water is not easily accessible (Morgan, 1998).

In Zimbabwe, rainwater harvesting has a valid application in the arid, high rainfall, rural and urban areas. In the drier parts of the country, sufficient water can be harvested at clinics to cater for the water needs of the clinics and its visitors throughout the year. The use of rainwater harvesting tank is being promoted by several NGOs both at the family level and at schools and clinics. An important use of rainwater harvesting may be in schools without adequate supplies of fresh water nearby, where the area of the roof is large and the potential for catching large amount of water is great (Morgan, 1998).

In India, there is a National Water Harvesters Network (NWHN). This is an organization that is saddled with the responsibilities of addressing and highlighting the local issues and the traditional systems relating to water harvesting to further the cause of community based water management (www.cseindia.org). In North eastern Brazil, rural workers, unions and NGOs play an important role in the organization, the carrying out and financing of

rainwater projects. Throughout Brazil's semi – arid region, these workers and other organizations are trying to convince politicians at a local and a state level of the possibility of sustainable development of the region, excluding the necessity for big irrigation projects from rivers or groundwater (Gnadlinger, 1999; World Bank, 1993; Smet, 2003).

1.2 Problem of the study

In many countries of the world, the sustainability of household water security through domesticated rainwater harvesting has attracted the attentions of the federal and local governments, NGOs and other legitimate and well-recognised agencies such as rural community organisations. For instance, in Sri Lanka, with the acceptance by the government of DRWH as a water supply option and with the formation of the Sri Lanka rainwater harvesting forum, the concept is gaining wide acceptance in many parts of the country (Ariyabandu, 1998). In 1996 and 1998, many new national rainwater associations were formed in Germany and Uganda, respectively (Terry 2000).

In countries such as Germany, Sri Lanka, China and Colombo, universities have been involved in domestic rainwater harvesting researches (Ariyabandu, 1998; Terry, 2000; Qiang and Yuanhong, 2000, and Heijnen and Mansur, 1998). Different international developmental organisations such as the World Bank, UNICEF, UNEP and UNESCO etc. have also been found to be involved in designing policies that did promote the concept of DRWH as a major strategy for sustaining water and food production security in most of the rural areas of the world (www.wsp.org).

Enugu north agricultural zone experiences short period of rainy season (and the rains always come very late) and long period of dry season. Rivers, streams, ponds, pipe borne water and wells are not easily accessible. The primary sources of water to both Nsukka-urban and rural dwellers are the University of Nigeria, Nsukka campus water plant and the domestic harvested water during the short rainy season. Domestic rainwater harvesting is a common phenomenon in the area and it forms the major sustainable water security to the farm families. The harvested rainwater has been source of water supply to the farm families who carry out their farming activities in the dry season. Such farming activities include Nsukka yellow pepper production, solanum production, vegetable (Ugu) production, etc.(Ugwu,2007).

The arduous collection condition of rainwater drastically limits water consumption, especially, in the rural areas. The harvested rainwater is more available to the richer members of the poor communities. During this annual long dry season, children, youths and adults are obliged to walk long distance places sourcing water supplies. This results to increase in household expenditures, decline in household income, loss of assets, savings and a rise in a number of dependants (relying on a small number of productive family members); high rate of absenteeism from work and drop out from schools, especially, among girls. The time for agricultural and other socio- economic activities is wasted in searching for water. Often, women would take over six hours to bring home 50 litres of dirty water that would not be enough for the family. This might result to disability of some family members due to water-

related diseases which cause the people to withdraw from potential supply of labour in farm and non farm economic activities (Ugwu, 2007).

Having established the existence and usefulness of DRWH in rural areas of many countries of the world, and the involvement of governments, NGOs, community-based organisations and various international developmental organisations in their promotion as a basic strategy for sustaining water security, one would like to find out how DRWH activities are being carried out in Enugu north agricultural zone. The study was also designed to determine whether or not, a national policy on domestic rain water harvesting is entrenched in the national water supply and sanitation policy in the state.

1.5 Purpose of the study.

The purpose of this study is to determine the DRWH activities for agriculture and domestic supply among farm-families in Enugu north agricultural zone and at the same, find out whether or not, a national policy on DRWH is entrenched in the national water supply and sanitation policy in the state. Specially, the study was designed to:

- (1) determine the DRWH methods/techniques being used by farm-families in Nsukka LGA of Enugu state;
- (2) determine households decision-making role in DRWH in Nsukka LGA of Enugu state;
- (3) determine the uses and perceived advantages of using harvested domestic rainwater by farm-families in Nsukka LGA;
- (4) determine the role of government, NGOs, Churches, University, Research institutes and local organisations/associations in DRWH in Nsukka LGA of Enugu state.

2.0 Methodology

Enugu north agricultural zone is made up of six LGAs, namely: Udenu, Nsukka, Igbo-Eze North, Igbo-Eze South, Uzo-uwani and Isi-Uzo. Out of these six LGAs, Nsukka LGA was purposively selected for the study (because of pronounced water shortage in the area). It is bounded by Isi-Uzo LGA in the East and in the West by Igbo-Etiti as well as in the North and South by Uzo-Uwani and Igbo-Eze LGAs. The 1992 census indicated that Nsukka Local Government Area has a population of 309633 (Federal Republic of Nigeria, 2007) persons. The population for the study consisted of the farm-families in Nsukka LGA. (Ugwu, 2007). Nsukka LGA is made up of 16 communities (Ihe-Owere, Ibagwa Ani, Okwutu, Alo-Uno, Edem, Obimo, Nru, Umakashi, Okpuje, Okpaligbo, Ede Obala, Lejja, Opi, Obukpa and Mkpunano) and out of these, 6 communities were purposively selected due to their involvement in many agricultural activities and water problem. The communities included Edem, Nru, Ihe-Owerre, Opi, Mkpunano and Obukpa (Ugwu, 2007). In each of the communities, two villages were selected (from the list of villages) through simple random sampling technique. From the two villages selected in Edem, a total of 15 farm – families were selected (From the list of available farm-families) using simple random sampling technique. The same number of farm-families were sampled from Ihe-Owere. From each of the remaining four communities (Nru, Mkpunano, Opi and Obukpa) 10

farm-families were also selected through simple random sampling technique (see Table 2). Therefore, the sample size for the study was 70 farm- families.

Table 2: The sample composition.

Name of communities	Edem	Ihe-Owere	Nru	Mkpunano	Opi	Obukpa	Total
Number of villages selected	2	2	2	2	2	2	12
Total number of farm-families	15	15	10	10	10	10	70

Data for the study were collected from the respondents through the use of well structured interview schedule. The instrument was divided onto 5 sections on the basis of the objectives. Data were analysed by using frequency distribution, percentage and mean statistic

3.0 Results and Discussion

3.1 Methods used in DRWH

Table 3 indicates that all (100.0%) the respondents were using roof top collection and a large number of them (54.3%) did captured ground water. The table further shows that only very few of them (7.1%) made use of polythene sheets. The findings imply that the major methods used by the farm families in the study area were the roof top collection and capturing of ground water. The polythene sheets were used occasionally, especially, when the family lives in a thatched house. These methods are also found in other countries of the world (Ariyabandu, 1998).

Table 3: Percentage distribution of respondents based on the various methods used in domestic rainwater harvesting (n=70)

Variable	(NO)	(%)
Roof top collection	70	100.0
Capturing of groundwater	38	54.3
Use of polythene sheets	5	7.1

Source: Field survey, 2007

* Multiple response

3.2 Households decision making role in domestic rainwater harvesting

Table 4 indicates that the husbands played the roles of provision of money for the construction (98.6%), purchasing of the needed materials from the market (45.7%) and repairing of damaged roof, containers and tanks (50.0%). The roles of initiating the domestic rainwater harvesting (78.6%), treating of water with alum (62.9%), and purchasing of water tanks (52.9%) rested on the wives.

Also, from Table 4, it is evident that the children played vital roles more than their parents in such areas as harvesting of water(77.1), cleaning of containers (91.4%), drawing of water from the well (71.4%) and cleaning of the roof, gutter and containers at the on-set of rainy seasons (91.4%).The

implication of these findings is that any extension programme mapped out to improve DRWH activities in the area should involve the husbands, wives and children.

Table 4: Percentage distribution of respondents based on the various household decision making roles in DRWH (n =70)

Variable	Household decision making roles		
	Husbands (%)	Wives (%)	Children (%)*
Initiator of DRWH	20.0	78.6	1.4
Provision of money for the construction	98.0	1.4	0.0
Purchasing of the needed material from the market	45.7	48.6	5.7
Purchasing of water tank	40.0	52.9	7.1
Digging of the underground well/tank	14.3	0.0	5.7
Construction of the gutter round the edge of the roof	15.7	0.0	4.3
Cleaning of container	1.4	7.1	91.1
Repairing of damaged roof, container and tank	50.0	41.5	7.1
At the on-set of rainy seasons, who cleans the roof, gutter and containers	4.3	4.3	91.4
Who draws water from the well	1.4	27.1	71.4
Who treats the water with chemical(Alum)	12.9	62.9	24.3

Source: Field survey, 2007

*Multiple respons

3.3 The uses of harvested rainwater

According to Table 5, harvested rainwater was used primarily for cooking food (100.0%), bathing (100.0%), molding of blocks (100.0%), livestock production (100.0%), washing of household utensils (100.0%), building of houses (98.6%), laundry work (95.7%), drinking (90.05), dry season crop production (80.0%), growing of seedlings in the nursery (54.3%), watering of ornamental flowers (30.0%) and flushing of toilet (28.6%). This implies that the harvested rainwater was used for different purposes by the farm-families and this is in agreement with what is obtainable in other countries of the world (Morgan,1998; Gnadlinger,1999; Smet,2003)

Table 5: Percentage distribution of respondents based on various uses of harvested rainwater (n=70).

Uses of harvested domestic rainwater	(N0)	(%)*
For cooking food	70	100.0
For bathing	70	100.0
For flushing toilet	20	28.6
Moulding of blocks	70	100.0
For building of household	69	98.6
Growing of seedlings in the nursery	38	54.3
For drinking	63	90.0
Used for laundry work	67	95.7
For dry season crop production	56	80.0
For watering ornamental flowers	21	30.0
Livestock production	70	100.0
Washing of household utensils	70	100.0
For income generation by selling	2	2.9
For fishery production	6	8.6

Source: Field Survey, 2007

* Harvested domestic rainwater was used for various purposes

3.4 The perceived advantages of using harvested domestic rainwater by farm-families

The respondents strongly agreed that DRWH helped to reduce family expenses on water ($\bar{X} = 4.0$) and the time loss in searching for water ($\bar{X} = 4.0$) ((Table 6) The table also shows that the respondents agreed that DRWH helped in checking run-off water ($\bar{X} = 3.0$), providing food and health security for the household members ($\bar{X} = 3.0$), improving the quality of life of the households ($\bar{X} = 3.03$) and providing additional time for children to carryout their studies ($\bar{X} = 3.33$). Readily availability of water in the rural area reduces the distance walked to fetch water and improves children's attendance at school (Ajayi and Ogba, 2006).

Table 6: Mean score distribution of respondents based on the perceived advantages of using domestic harvested rainwater by farm families (n = 70)

Perceived advantage	SA (4)	A (3)	D (2)	SD (1)	(Total score)	Mean Score (\bar{X})
It reduces family expenses on water	288	39	0	0	267	4.0
Reduces time loss in searching for water	188	69	0	0	257	4.0
It helps in checking run-off water	28	174	10	0	212	3.0
It provides food and health security for the household members	28	162	18	0	208	3.0

It improves the quality of life of the household	40	105	50	0	195	3.0
It provides additional time for children to carryout their studies	36	144	24	1	205	3.0

Source: Field Survey, 2007

Supportive Role Expectation of the Governmental and Non-governmental Agencies for Effective DRWH

According to Table 7, the governments (federal, state and local governments) is expected to perform the roles of formulating policies concerning planning, implementing and operation of DRWH supply and sanitation; funding of DRWH projects; addressing local issues arising from DRWH; designing and implementing campaign strategy for effective and healthy harvesting and use of rainwater, and environmental sanitation education; and promotion of DRWH materials (e.g. tanks). Unfortunately, none of these roles was found to have been performed by the Nigerian governments unlike what is in practice in other countries such as Sri-Lanka, Peru India, China, Mexico Brazil and Zimbabwe (www.wsp.org).

Although the 2000 National Water Supply and Sanitation Policy (WSSP) in Nigeria stated that government should sponsor capital investment for rural water supply, DRWH projects were not entrenched and the level of provision of water in the rural areas is still very low (Gbadegesin and Olorunfemi, 2007). If local conditions and demand are taken into account in the planning, financing, implementing and operation of water supply and sanitation systems, the sense of ownership and willingness of communities to share in the cost and operations / maintenance will be greatly enhance, thereby increasing the sustainability of the systems (Gbadegesin and Olorunfemi, 2007).

In other countries of the world (e.g. Brazil, Afghanistan, Mexico, Niger, Palestine, Zimbabwe, Sri Lanka, Germany, China, Australia, and Colombo), various agencies, apart from their governments, were found to be actively involved in funding of the DRWH projects; addressing local issues arising from DRWH; providing campaign for effective and healthy harvesting and use of rainwater and environmental sanitation education; promoting DRWH materials (e.g. tanks); and carrying out advocacy (Morgan, 1998; Gnadlinger, 1999; Agwu, 2007). However, the contrary to these is obtainable in Nigeria as evident in Table 7.

Table 7: Supportive Role Expectation of the Governmental and Non-governmental Agencies for Effective DRWH in Nigeria

Government and Non-Governmental Agency	The Supportive Role Expectation of the Agency					
	Policy Concerning planning, implementing and operation of DRWH supply and sanitation	Funding of DRWH project	Addressing Local Issues arising from DRWH.	Design and implementation of campaign for effective and healthy harvesting and use of rainwater and environmental sanitation education	Promotion of DRWH materials (tank)	Advocacy (calling the attention of both the Local and State Government
Federal Government (Federal Ministry of Water Resources)	X	X		X		
State/LGA Water Agencies	X	X	X	X	X	
UNICEF		X			X	X
Ministry of Health	X	X		X	X	
FAO		X			X	X
WHO		X				
World Bank		X			X	
UNEP		X				
Churches		X	X	X		
Schools		X	X	X		
ADP		X	X	X	X	X
Rainwater Harvesting Research Group		X	X	X	X	X
Local Associations		X	X	X	X	X
University	X	X	X	X	X	X

X = Expected supportive role not performed.

Conclusion

Based on the findings of this study, the following conclusions were made:

1. The major methods being used by the farm-families in harvesting rain water were roof top collection and capturing of the land surface water
2. The husbands, wives and children were all involved in household decision - making roles in DRWH.
3. The rain water harvested had varying advantages with varying uses to the farm families for agriculture and domestic supplies..
4. There were expected policy and supportive roles needed for the effectiveness of DRWH from the governments and other agencies which were yet to be carried out

Recommendation

- 1) It was recommended that the National Water Supply and Sanitation policy of Nigeria should be reviewed to accommodate domestic rain water harvesting domestic and agriculture supply.
- 2) Both governmental and non - governmental agencies should be actively involved in funding of the DRWH projects in the study area. Besides, they should be adequately and effectively involved in addressing local issues arising from DRWH and providing campaign for enlightenment, healthy harvesting, proper storage and good environmental education relating to the use of harvested rain water.
- 3) The non-governmental agencies (e.g UNDP, IFAD, UNICEF and churches) should perform the role of advocacy relating to increasing the level of water supply in the rural area, especially, through DRWH.

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Effect of Sedentarization on Social Services Available to Pastoral Fulanis in Abeokuta North Area of Ogun State

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Abstract

The study examined the demographic characteristics of the pastoral Fulanis, length of stay in their current location as well as access to formal education and other social services. Primary data were collected from 80 pastoral Fulanis in Alamala Adehun, Mologede and Obete villages selected by simple random sampling techniques. Chi-square analysis was used to test two null hypotheses. It was found that there were no significant relationships between respondents' demographic characteristics (age, marital status, sex, educational level and household size) and their length of residence on the one hand and social services enjoyed and length of residence on the other. It was discovered that sedentarisation contributed to livelihood diversification into crop farming and petty trading but has not influenced the social services enjoyed. It was recommended that pastoral Fulanis should be provided with adequate extension services and social facilities, such as education, water supply, electricity, adequate transportation and farm credit. This will contribute effectively to the agricultural development of Nigeria.

Key words: *Sedentarization, Social services, Pastoral Fulanis*

Introduction

Over several centuries, the Fulanis have developed a herding system that withstands conditions of tropical rain, heat, humidity and the dusty-dry Hamattan season. This herding system is widely known as nomadism. In this system, the migrant Fulanis often come across life-threatening hindrances such as drought, diseases, tribal enemies, and cattle thieves. The encroachment on grazing land and cattle-route by the land hungry farmers expose the animals to potential starvation. One of the promising responses to these challenges by the nomadic Fulanis is a gradual process of sedentarization. Sedentarization is the act of settling down. It also implies the process of moving from the nomadic to a settled way of life. In this evolving process, the primary occupation of the Fulanis remains cattle herding supplemented by farming at various locations in the southern end of the old nomadic route. These new settlements also offer resting places and link with local population for Fulanis herdsman who keep the nomadic tradition. Current studies have shown that about a tenth of the Fulanis population found in southwest Nigeria have jobs other than herding or farming (Omotayo et al., 2005); even though these non herding jobs are seasonal and opportunistic. For instance, during wet season the Fulanis take advantage of the high manure presence in their cattle-holding paddocks to plant corn, sorbet, millet and raise vegetables in their backyards. The resulting farm stubble is also fed to animals as supplementary feed. In these emerging settlements, domestic responsibilities fall on the women who process and cook the food. Girls

and women weave mats, spin cotton into thread, make household decoration and collect herbs and vegetables. They also buy food from market, milk the cow, churn the milk and make butter. They sell milk and butter and do craftwork such as decorating calabashes (Riesman, 1997 and Fricke, 1979). Women and girls are also responsible for cleaning the compound; growing vegetables, raising poultry and non-ruminant stock, handling disabled animals, fetching water, collecting firewood, help in making temporary shelter, as well as bearing and nurturing the children (Vengorff, 1980 and Awogbade, 1983).

Since 1976, a process stressing the human aspects in pastoralism began in Nigeria. The Fulanis Amenities Program (1976), the Land Use Act (1976) and Nomadic Education Programmes (1986) are examples of the new approaches that seek to address the issues of human capital development among the Fulanis. Despite these efforts, the Fulanis are among the most neglected of Nigerian ethnic groups (Bonfiglio *et. al.*, 1993). The challenges faced by the Fulanis herdsmen range from environmental limitations, absence of formal education, problem of mobility, land use limitation, failure to implement government programmes properly, stereotyping and lack of access to formal credit. The absence of men and women with high levels of Western education among the herdsmen has put the Fulanis at the mercy of more educated ethnic groups in Nigeria. Against this background, this study intends to:

1. Examine the evolving process of sedentarization
2. Determine its propensity to avail the settled Fulanis greater access to social services
3. Determine if the longer the Fulanis stay in a place of residence the higher the level of social services they will enjoy.

Methodology

The study was conducted in Abeokuta North Local Government Area of Ogun State among pastoral Fulanis. Simple random sampling technique was used to select 20 Fulanis households from four (4) purposively selected locations namely Alamala, Adehun, Molegede and Denro Settlements. These settlements are the main locations of settled Fulanis along the old nomadic route passing through Ogun State. A sample size of 80 individual pastoralists was drawn from the selected households.

Primary data on demographic characteristics, social services enjoyed and the length of stay in the selected locations were obtained through the use of an interview schedule. The variables obtained include:

1. Age measured in categories as 18 – 24, 25 – 34, 35 – 44 or 45 and Above
2. Marital status measured as married or single
3. Sex measured male or female
4. Educational level measured as No Formal Education, Incomplete Primary Education, Qur'anic, Complete Primary/Qur'anic or Post Secondary/Qur'anic
5. Household size measured in categories as 1 – 4 persons, 5 – 8 persons or Above 9 – 12
6. Length of stay by pastoral Fulanis in the current settlement measured in years
7. Number of cattle owned measured in categories as 11 – 15 heads, 16 – 20 heads, or Above 20 heads
8. Sources of replacement stock measured as Old stock, nearby market, Directly from Northern Nigeria or nearby market + old stock

9. Other source of income measured as Crop Farming Alone, Sheep + Goat + Crop farming, Wage Alone, Wage + Crop Farming, Goat Alone or Crop farming + Goat
10. Key constraints faced by pastoral Fulanis in setting down obtained as responses to an open-ended question
11. The Social Services enjoyed by pastoral Fulanis measured as Market, Bank/credit facility, Hospital/healthcare, Veterinary services, Pasture, School or Electricity
12. Livestock Treatment used by Pastoral Fulanis interviewed measured as Traditional or Veterinary services

The data was analyzed with descriptive statistics such as pie charts, bar charts, frequency distribution, percentages and mean. Chi-square analyses were used to test the null hypotheses in the study.

Results and Discussion

Description of respondents

Most of the pastoral Fulanis interviewed (57.5%) were between 35-44 years age category, 97.5% were married while 97.5% were male, 66.3% had no formal education and 66.7% had 1-4 person household size (Table 1). Similar findings reflecting young, married Fulanis with low household sizes were found in Omotayo et al., (2005; 2006). The prevalence of male in the sample may however be due to the patrilineal nature of the Fulanis society which makes it almost impractical for an outsider, including researchers, to sit a woman down for a formal or semi-formal interview Riesman (1977). In addition, Table 1 shows some characteristics of these Fulanis group. They own more than 20 heads of cattle (96.3%); obtain replacement from old stock (75.0%) and earn additional income mainly from crop farming alone (68.9%). It is noteworthy however that an emerging group among settled Fulanis (6.3%) is now earning additional income from wages (Table 1).

The sedentarization process and factors affecting it

The Fulanis are traditionally a group of West African pastoralists. They move over vast areas and cross many cultures from the Sene-Gambia through the grasslands of the Sudan (Stenning 1959). However, in course of time some Fulanis began to break away from this distinctive nomadic pastoralism to settle as they were converted to Islam. But the prevalence of stereotyping in cultural relations has underplayed the characteristics of the settled Fulanis in any discussion about the Fulanis (Omotayo et al., 2005). Figure 1 shows that the majority of the respondents (97.5%) have settled in their current settlement for more than 11 years, yet some new settlers were found (2.5%) who came in between 1 to 5 years ago.

Settling down has not been without its pain however. As shown in Figure 2, the main constraints to settling down are disease infestation, distance to nearby towns and social services as well as hostility from local communities. Even though, diseases alone were reported by only 1% of the respondents, it was mentioned by all except the two women included in the sample. Even though, studies on conflict between Fulanis settlers and the local farmers have dominated the literature (Omotayo, et al, 2005; Waters-Bayer and Taylor-Powell 1986; Awogbade, 1982) it was mentioned by

44% of the respondents. The concern for distance to nearby towns and social services gained more prominence as mentioned by 97% of the respondents.

Table 1. Socio-economic characteristics of the pastoral Fulanis (n =80)

Parameters	Frequency	Percentage
Age (Yrs)		
18 – 24	1	1.3
25 – 34	12	15.0
35 – 44	46	57.5
45 and Above	20	25.0
No Response	1	1.3
Marital status		
Married	78	97.5
Single	2	2.5
Sex		
Male	78	97.5
Female	2	2.5
Educational level		
No Formal Education	53	66.3
Incomplete Pry. Education	1	1.3
Qur'anic	24	30.0
Post Secondary/Qur'anic	1	1.3
Complete Primary/Qur'anic	1	1.3
Household size		
1 – 4	10	66.7
5 – 8	3	20.0
Above 9 – 12	2	13.33
Number of cattle owned		
11 – 15	2	2.5
16 – 20	1	1.3
Above 20	77	96.3
Sources of replacement stocks		
Old stock	60	75.0
Nearby market	13	16.3
Directly from North	2	2.5
Nearby market + old stock	3	3.8
No Response	2	2.5
Other source of Income		
Crop Farming Alone	55	68.9
Sheep + Goat + Crop farming	8	10.0
Wage Alone	1	1.3
Wage + Crop Farming	4	5.0
Goat Alone	1	1.3
Crop farming + Goat	1	1.3
No Response	10	12.5

Source: Field Survey, 2007.

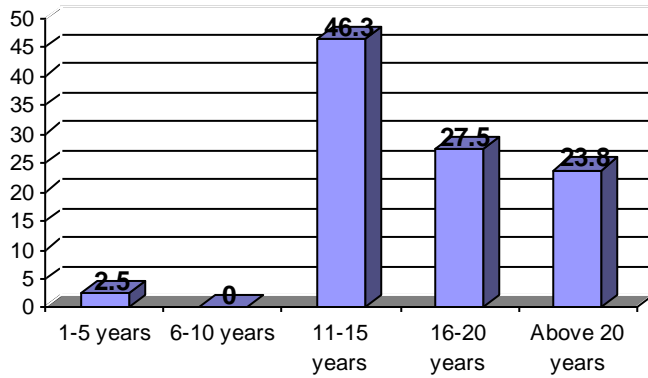


Figure 1. Bar chart distribution of pastoral Fulanis on the length of time stayed in the current settlement

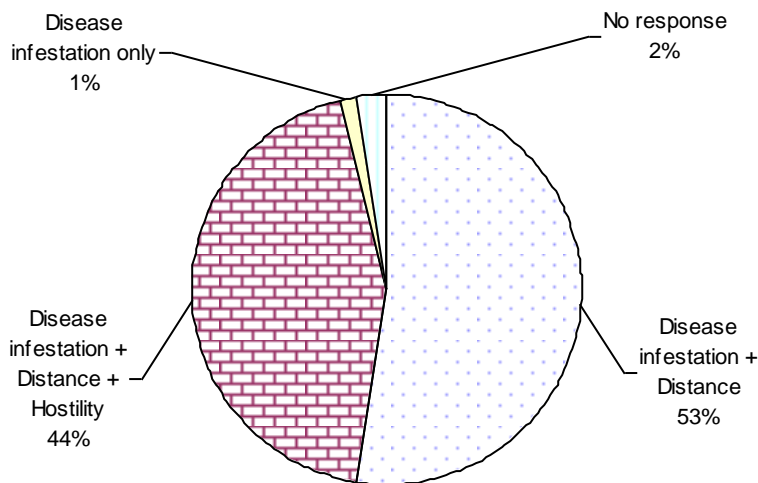


Figure 2. Pie chart distribution of pastoral Fulanis based on the key constraints faced in setting down (n = 80)

Social services enjoyed by pastoral Fulanis

Majority of the respondents (90% and 100% respectively) admitted that they enjoy healthcare facilities and good pasture for their animals (Figure 3). While the search for good pasture is the primary reason for choice of locations to settle down by Fulanis, the case of healthcare services enjoyed is rested on the ability of the Fulanis to pay for private medical facilities which abound in nearby villages, towns and urban centres.

However, Figure 3 also shows that 20.4% of the pastoral Fulanis interviewed claim to have access to veterinary services. It is noteworthy however that no veterinary service is located in or around their settlement. The pastoral Fulanis have to move to nearby towns and urban areas to procure drugs for their cattle.

Similarly, access to market, bank and credit faculties are enjoyed by only 20.4% and 27.4% respectively. The import of these is that the potential contributions of the Fulanis to the formal economy in Nigeria are currently under-tapped. Monies generated from their business transactions often go unreported in the nation's per

capita income. The provision of market and banking facilities are therefore an untapped opportunity for the nation.

Furthermore, Figure 3 also shows that (96.2%) of the respondents interviewed has no access to formal education. This implies that the pastoral Fulanis have no access to school and even the ones that claim to have access (3.8%) have to travel long distances to the nearest schools.

Finally, the situation with electricity is the most drastic. None of the respondent enjoy electricity services. This is not surprising however, given that Nigerians in many urban and rural locations are not satisfied with electricity supply.

On further probe, it was revealed that about 68.8% visit veterinary doctors/services while 25% make use of traditional way in treating their affected cattle (Figure 4).

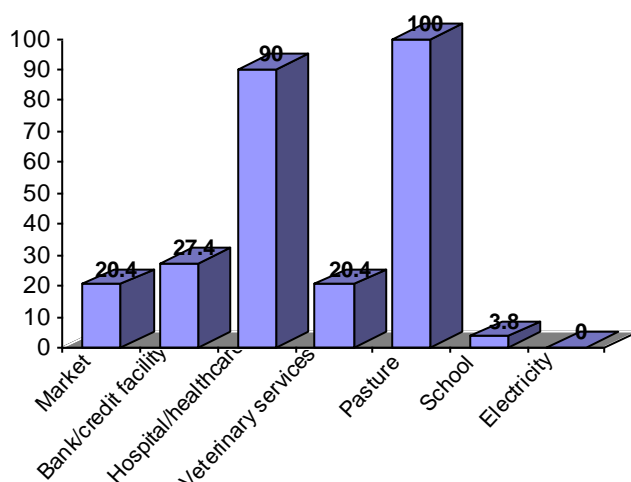


Figure 3: Bar chart distribution of pastoral Fulanis based on the Social Services enjoyed (n = 80)

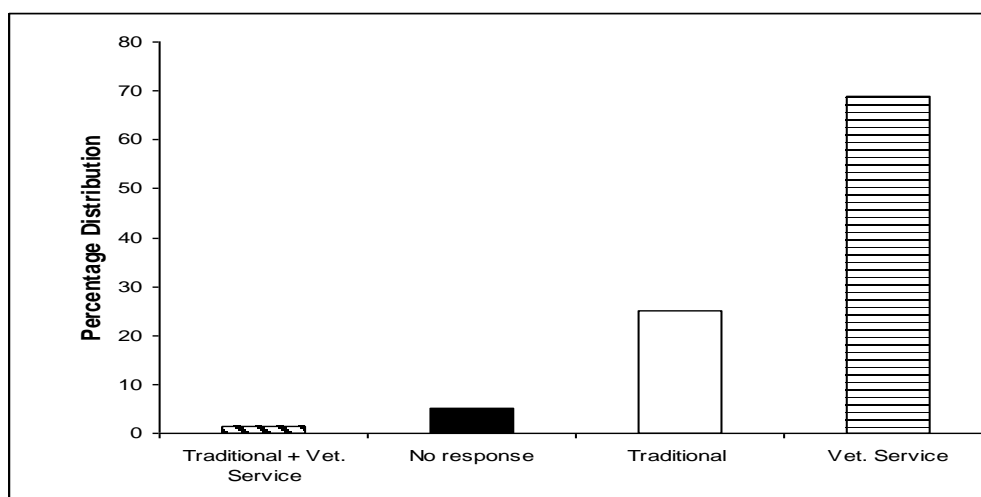


Figure 4. Bar chart distribution of livestock treatment by pastoral Fulanis (n=80).

Dependence of socio-economic characteristics of the Pastoral Fulanis on length of residence

The result shows that the length of time that pastoral Fulanis are resident in their current abode is independent of selected socio-economic characteristics. As shown in Table 2, the null hypotheses cannot be rejected for age, marital status, education and sex. It appears that length of residence in current abode is independent of these characteristics. The case is however different for household size. It appears that length of residence is dependent on household size. A closer look at the contingency table for household size and length of residence shows that pastoralists with larger household sizes tend to stay longer in a place of abode. This may be due to increasing difficulty of moving a larger household in the nomadic tradition.

As shown in Table 3, of all the social services enjoyed by the Fulanis, the null hypotheses was rejected only in the case of access to market. It appears that access to market is dependent on length of residence. It seems that the longer the Fulanis stay in a place of abode, the greater their access to market. Similar relationships cannot be assumed for their access to hospital, veterinary services, schools as well as bank and credit facilities. The Chi-square analyses cannot be run for access to electricity which nobody claims to enjoy and access to pasture which is enjoyed by all respondents.

Table 2. Results of Chi-square analyses to determine the dependence of socio-economic characteristics of the Pastoral Fulanis on their length of residence

Variables	χ^2 calculated	df	p	Decision
Age	17.48	12	0.13	Do not reject Ho
Marital status	2.38	3	0.50	Do not reject Ho
Educational level	5.17	12	1.00	Do not reject Ho
Household size	61.48	6	0.03	Reject Ho
Sex	0.92	3	0.82	Do not reject Ho

Source: Field Survey and Chi-square calculated

χ^2 calculated = Chi-square calculated

p = Probability level

df = Degree of freedom

Table 3: Results of Chi-square analyses to determine the relationship between social services enjoyed and the length of residence of Pastoral Fulanis

Variables	χ^2 calculated	Df	p	Decision
Market	13.67	3	0.00	Reject Ho
Hospital	2.38	3	0.50	Do not reject Ho
Veterinary service	2.02	3	0.57	Do not reject Ho
School	3.62	3	0.31	Do not reject Ho
Bank / Credit facility	2.38	3	0.50	Do not reject Ho

Source: Field Survey and χ^2 calculated, 2007.

χ^2 calculated = Chi-square calculated

p = Probability level

df = Degree of freedom

Conclusion

It can be concluded that length of residence is independent of the most of the demographic characteristics of the pastoral Fulanis. Similarly, irrespective of their length of stay, sedentarisation does not appear to have engendered greater access to social services enjoyed by pastoral Fulanis. It was discovered that sedentarisation contributed to livelihood diversification into crop farming and petty trading but has not influenced the social services enjoyed. It was recommended that pastoral Fulanis should be provided adequate extension services and treated as key stakeholders in the provision of social facilities, such as education, water supply, electricity, adequate transportation and provision of farm credit. Considering the role that Pastoral Fulanis play in nation's economy, it is essential that they should have:

- Social facilities such as water supply, electricity, amongst others should be provided so as to improve their standard of living and enhance their contribution to agricultural development thus improving national economy.
- Adequate transportation facilities should be provided for them by constructing good road that would link their settlements to the major markets to enhance good marketing activities.
- Farm credit: Fulanis must be assisted to overcome the problem of lack of capital so that they can take advantage of new developments in farming techniques. This can be done by establishing a revolving loan scheme for granting small seasonal loans in cash or kind to needy ones. The loans can be recovered in form of farm produce immediately the crop are harvested or through sales of their cattle.
- Supply of agricultural input: As an incentive government should make available to pastoral Fulanis essential agricultural input e.g. improved seeds, veterinary services amongst others.
- Agricultural training programme: Attention must be given to the training of pastoral Fulanis by extension officers for the pastoral Fulanis to adopt recommended technology and achieve desired levels of production.
- Co-operative societies: Every effort should be made to promote the formation of co-operative societies by the pastoral Fulanis. They should be encouraged to join existing co-operative associations or form new producer – oriented agricultural co-operatives that can qualify them to receive necessary assistance from the government and financial institutions in order to increase their production capacity.

The implication of all these for policymakers is that a conscious effort need to be placed in addressing sector-specific needs of different stakeholders in the agricultural sector. Pastoral Fulanis constitute an important group of livestock farmers in Nigeria. Efforts to improve their living conditions through the provision of essential social services will contribute effectively to the agricultural development of Nigeria.

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Influence of Information Sources on Awareness of Forestry-related Technology in Southwest Nigeria.

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Abstract

Forestry-related technologies (FRTs) are practices to mitigate and ameliorate effects of environmental degradation resulting from agricultural production practices. However, inadequate sources of information on FRTs among farmers limit and hinder farmers' awareness of such technologies. This study investigated the interrelatedness of information sources and awareness of FRTs in Southwest Nigeria. Multi-stage sampling technique was used to randomly select respondents from Forestry Research Institute of Nigeria (FRIN) catchments areas in the study area. A total of 444 respondents were selected for the study. Data on information sources and awareness were collected using a structured interview schedule. Analysis involved use of descriptive statistics and Pearson product-moment correlation. Predominant sources of FRT information were forestry staff (95.5%) and relatives (66.2%). Most farmers (91.7%) were aware of windbreaks, 89.9% each were aware of taungya and fuelwood production while 83.0% was aware of alley farming. Farmers' information sources is significantly related to their awareness of FRT ($r= 0.40$, $p< 0.01$). It was concluded that farmers' information sources affect their awareness of FRTs. It was therefore recommended that information sources on FRTs should be improved upon in order to enhance farmers' awareness of them.

Keywords: *Farmers, Forestry-related technology, Information sources and Awareness.*

Introduction

A forest is a large area of land covered with trees and other plants growing

close together. It is a plant community, predominantly of trees or other woody vegetation, occupying an extensive area of land (Adams, 2007). The term forest is used to describe land with tree canopy or cover of not more than 10 percent of an area of 0.5 ha. Forests and tree resources have played an important role in household food security, especially during seasonal and emergency hardship periods. The importance of trees and tree products varies greatly from community to community. In the Sahelian region browse represents an estimated 30-40% of the dry season feed (Le Houerou, 1986). Forestry efforts have been known to substantially alter fundamental social, economic and political factors at the root of many food supply inequalities. It could be concluded that the answer to declining availability of food, income or employment lies in forest-based interventions.

Forestry-related technologies (FRTs) are the practices devised to help address the problem of environmental hazard caused by disturbance of natural ecosystems. According to Adu (2005), forestry-related technology has been the most consistent driving force behind environmental development and it has contributed from one-half to two thirds of environmental amelioration over recent decades. In fact, they are fast becoming a mainstay of many interventions and at the same time, they are of importance to the nation's economy as the industries they support

provide means of livelihood to the people while their products offer means of income and foreign exchange earnings. These conservation technologies have been readily and widely adopted by farmers as most of them primarily address on-farm issues, including reduced tillage for reducing erosion. Some of these technologies are woodlots development, taungya, home-gardens, alley cropping, plantation crops combination, apiculture, aqua forestry, borderline planting and protein banks. It should be noted that the adoption decisions of forestry-related technologies are more complicated than those for annual crops in that many costs and benefits of the practices are not obvious in the first few years (Onumadu, 2002). This is because of the long-term result of forestry. Farming systems are highly complex. A change in one part of the system tends to create a cascade of changes throughout the system and as such, though policy initiatives may be directed at one particular aspect of the farming system they may have consequences for the entire farming system (Kaine and Bewsell (2003). For instance, the introduction of a new technology may generate different benefits in different farming contexts and the resultant effect is different applications and adaptations of the technology.

A number of technologies have been generated and are available. However, its sustainability in terms of the farmers' awareness of such technologies and the sources of awareness has not been given adequate consideration. In Nigeria, especially in the Southwestern States, problems of discontinued use prevailed. This is as a result of inadequate awareness of the benefits accruable from some technologies. Marra *et al.*, (2003) and Angba (2000) submitted that the awareness of the indigenous livelihood system is imperative to develop a sustained agricultural technology.

Various sources of information are used to disseminate agricultural technologies. Many findings revealed that younger, better-educated farmers have more contact with information sources and change agents than illiterate farmers (Onumadu, 2002). While it is lucidly stated that the acceptance of information or idea by individuals depends on the credibility of the source, Akinbode (1969) pointed out that the extent to which farmers use information sources could also be influenced by their socio-economic status. William *et al.*, (1998) found significant positive relationship between mass media exposure and innovativeness. They also reported positive association between mass media exposure and opinion leadership in Columbia. Conversely, Rangaswamy *et al.* (1972) observed that personal sources such as friends, neighbors and relatives are the major sources of information accounting for 52 percent out of 12 selected sources of information in India.

When farmers could no longer have access to information about an innovation they have adopted, sustaining such innovation may be affected. Boardman (1990) emphasized that farmers must continue to have access to information systems to reassure them that the innovation they have adopted could be sustained. Moreover, the fact that forestry-related technology is mostly practiced by farmers within and around government reserves, farmers need to have up-to-date information in order to allay their fears of losing their farmlands to the government once the innovation they adopted is thriving, thereby increasing their level of poverty (Adu, 2005). As such, the development of an enduring FRT, which can attract maximum participation of target group, will require a virile source of information.

It is against this backdrop that an assessment of the information sources available to farmers and their awareness of Forestry-related Technologies is very crucial, as this is an important factor which will aid an appreciation of the overall

performance of FRTs and thus help in developing an effective people-oriented FRT programme.

Hypothesis

There is no significant relationship between respondents' sources of information and their awareness of FRTs.

Methodology

The area of study is southwest Nigeria. It lies between Latitudes 5° and 9° N and has an area of 114.271km² representing 12% of the country's total land area. It includes Edo, Delta, Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States. The study population consists of all farmers in Catchment areas of Forestry Research Institute of Nigeria (FRIN) in Southwest Nigeria.

Multi-stage sampling technique was used in selecting samples for the study. First, four states in Southwest Nigeria (Oyo, Ogun, Ondo and Edo) having FRIN stations and sub-stations (Onigambari, Olokemeji, Ore and Sakpoba) were purposively selected. Second, in each of the selected areas, 50% of the villages were randomly selected. At Onigambari (Oyo State), six out of the twelve villages were randomly selected. At Olokemeji (Ogun State), five out of the ten villages in the area were randomly selected. At Ore (Ondo State), five out of the ten villages were also randomly selected while at Sakpoba (Edo State); six out of the twelve villages were randomly selected. Finally, ten percent (10%) of the registered farmers in all the selected villages were then randomly selected and these amounted to 444 respondents.

Both descriptive and inferential statistics were used to analyse the data collected. Descriptive statistics used include frequency count and percentages. Frequency table was used to show respondents' personal characteristics and information sources for each technology while inferential statistics-Pearson product moment correlation was used to determine the relationship between information sources and awareness of forestry-related technologies in the study area.

Table 1: Showing sampling procedure and sample size

Areas/States	Selected Village(s)	Total Number of Registered Farmers	10% Sample
Onigambari (Oyo State)	Gambari	230	23
	Busogboro	83	8
	Adebayo	182	18
	Dalley	102	10
	Longe	321	32
	Karangbada	19	2
	Total	937	94
Olokemeji (Ogun State)	Olokemeji	408	41
	Akintoye	52	5
	Alade	270	27
	Ogunsile	580	58
	Olowo	174	17
	Total	1484	148

Ore (Ondo State)	Ogbeni	100	10
	PWD (People Work and Die)	202	20
	Asejire	191	19
	Oniseere	155	16
	Adewinle	283	28
	Total	931	93
Sakpoba (Edo State)	Sakpoba	418	42
	Onah	102	10
	Avbeh	91	9
	Iguemokhua	204	20
	Evbuosa	180	18
	Evbuarhue	96	10
	Total	1091	109
Grand Total	18	4443	444

Results and Discussion

Table 2 shows that most of the respondents (33.1%) fell within 40-49 years age bracket an indication that more able-bodied people are involved in farming especially Forestry, which has a tedious nature, requires that a farmer is young, agile and able bodied so as to be able to withstand the pressure of work. However, only 18.2% of the respondents were 60 years and above. This may be due to the tedious nature of farming which makes it impossible for old people to stay away from it. The mean age of respondents was 47 years ranging from 20-70 years. This finding supports that of Ige (2000) and Adu (2000) that there was a predominance of medium aged people among the farming population.

Table 2: Distribution of respondents based on age.

Age	Frequency	%
20-29	111	25.0
30-39	39	8.8
40-49	147	33.1
50-59	66	14.9
60 and above	81	18.2

\bar{X} Age = 47 years

Sex of Respondents

Figure 1 indicates that 64.0% of the respondents were males while only 36.0% were females. This shows that there is gender imbalance in agricultural practice and it also confirms the assertion of Ipaye (1995) and Adu (2000) that men dominate the present farming population in southwest Nigeria. This might be because women do not have land ownership rights except in cases of inheritance from parents or husbands. The implication of this is that only few women are involved in FRT utilization.

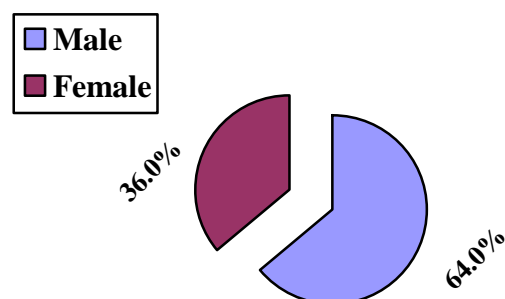


Fig.1: Showing Respondent's Sex
Respondents' educational background

Education is an essential factor for effecting desirable changes in attitude, skills and knowledge of individuals (Odebode, 1997). Table 3 indicates that a total of 37.1% of the respondents had no formal education - an indication of the low level of formal education in rural communities. A marked difference was observed between respondents with primary school education (42.7%) and those with secondary school education (18.7%). This could be a function of poverty in the area. The effect of education on awareness of FRTs is that it broadens the mind and widens the scope of the individuals concerned. There can sometimes be relationship between education and the awareness of forestry - related technologies. According to Kilpatrick (2000), beneficial innovations tend to be adopted more quickly by farmers with higher levels of education as they are often exposed to various information sources. From the above, it could be deduced that educational background will aid easy understanding of what forestry-related technology is about and the decision to use it.

Table 3: Showing respondents' educational background

Educational Background	Frequency	%
<i>No formal</i>	164	37.0
Primary	190	42.8
Secondary	83	18.7
Tertiary	7	1.5
Total	444	100.0

Sources of Information

Table 4 reveals that majority of the respondents (97.5%) got information on fuelwood production from relatives. This may be because fuelwood is used among rural populations for heating and also, it is one of the by-products of woodlot development, and as such it is easily passed on to on-coming generations. Only 1.3% of the respondents received information on fuelwood production from forestry staff and contact farmers. This is an indication of the importance of the technology to respondents' household energy consumption. Thus confirming the assertion of Ige (2000) that fuelwood serves as the main source of energy for rural households and many small-scale industries. Furthermore, the Table shows that 91.0% of the respondents got information on woodlot development from forestry staff. Receiving information directly from forestry staff, suggests the tendency that information will be well understood and this will aid the use of FRTs. Only 1.0% got information on the

technology from the media. Table 4 further shows that about 80.0% respondents received information on use of trees in soil conservation from forestry staff. This is because tree planting has long gestation period and thus, requires that farmers be persuaded and convinced about it. Only 15.5% respondents received information from relatives while 3.2% and 1.5% received information from contact farmers and media respectively. Fifty two percent of the respondents received information on use of improved fallow from forestry staff and this was closely followed by relatives with 32.0%. Contact farmers followed this with 26.0% respondents while only 1.0% got information on improved fallow from the media. Also, Table 4 reveals that 87.0% respondents received information on erosion control from relatives. It could be deduced that the technology, being an age-long practice was passed down to them by their forefathers.

Generally, the result shows that the respondents obtained more information on forestry-related technologies from forestry staff, which could be due to the presence of FRIN sub-stations and the states forestry departments in the area. This was closely followed by relatives, an indication that most of the technologies are age-long practices engaged in by farmers. However, the result reveals that none of the respondents received information on any of the technologies from agricultural extension agents because agricultural extension agents do not disseminate forestry information (Obibia kwu and Hurst, 1977; Anigwe 1990; Abu and Afeyodion, 2000; Adeyemo, 2003 and Adu *et al*, 2004). DESA (1999) submitted that relatively little attention has been given to the need for increased forestry-related technology diffusion to the end beneficiaries through extension workers. The source through which farmers get to know of an innovation will influence awareness, perception, use and continued-use of such technology. It can be presumed that where there is intense communication and sharing of knowledge, the emergence of use would be promoted. (Shih and Venkatesh, 2004).

Table 4: Information Sources for FRTs

Technologies	Media		Extension agents		Forestry staff		Contact farmers		Relatives	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Alley Farming	6	1.5	-	-	370	91.6	6	1.5	22	5.4
Woody Perennial for Shelter	3	1.0	-	-	112	35.0	2	0.6	203	63.4
Windbreaks	6	1.5	-	-	71	17.4	26	6.4	304	74.7
Borderline Planting	9	2.0	-	-	125	28.2	10	2.3	300	67.6
Taungya	4	1.0	-	-	315	81.2	51	13.1	18	5.0
Woodlot Development	3	1.0	-	-	291	91.0	6	2.0	21	7.0
Fruit trees raising	1	0.4	-	-	212	80.3	5	2.0	46	17.4
Trees in soil conservation	5	1.5	-	-	274	80.0	11	3.2	53	15.5
Improved fallow	5	1.0	-	-	259	52.0	75	26.0	159	32.0
Roadside planting	7	4.8	-	-	125	85.0	4	3.0	11	7.5
Erosion Control	1	0.3	-	-	30	10.0	11	4.0	309	87.0
Fuelwood production	-	-	-	-	5	1.3	5	1.3	389	97.5

Awareness of FRTs

Table 5 shows that 83.3% of the respondents were aware of alley farming. This may be because alley farming improves economic stability, increases cash flow and enhances sustainable agricultural system as it enables farmers to produce food crops and at the same time enhances good performance of crop yield as the tree components are effective nutrient pumps, which bring minerals from the lower soil profile to the

	Aware	Not aware
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surface. (Hodge, *et al.*, 2002). Moreover, 87.2% of the respondents in the area were aware of Taungya. This may be because it was the initial technology introduced to farmers in the area when the plantations were to be established and as such, respondents had gotten used to the technology.

The Table also shows that 91.7% of the respondents were aware of windbreaks. This is expected, as respondents may need to plant trees in order to shield either crops or buildings from heavy wind or rainstorm. This finding agrees with the work of Vanclay (2002) that planting trees around farms serves as windbreaks for the crop as well as prevention of soil erosion. This is necessary in order to combat the transition of the southwestern Nigeria from rain forest to derived Savannah. About 91.9% of the respondents were aware of borderline planting. This may be because it is an age long practice which farmers use for land or boundary demarcation. Furthermore, Table 5 reveals that a larger percentage of the respondents (89.2%) were aware of fuelwood production. This is an indication of the wide usage of fuelwood as the major source of energy by rural households. Sixty eight percent of the respondents were aware of woodlot development while the remaining 31.1% respondents were not aware of the technology. For trees in soil conservation, 75.5% claimed awareness of the technology. This may be because it is an age long practice. Ogunsanwo *et al.* (2003) submitted that respondents value the usefulness of trees in soil reclamation and attested to its ability to replenish the soil. Only 24.5% were not aware of the technology. However, majority of the respondents (70.3%) were not aware of roadside planting. The few (29.7%) who were aware of the technology claimed they had either at one time or the other worked with Forestry Research Institute of Nigeria or parastatals that are into environmental beautification. Roadside planting is largely an environment beautification project, which has little or nothing to do with farming activities, and as such, it is not out of point for farmers not to be aware of the technology. The mean awareness score was 10.18

Generally, respondents' awareness of FRTs in the study area could be adduced to the professional advice and expertise that are likely to have been impacted to the farmers by staff of FRIN and States Forestry Department in the area and it is expected that if awareness is high, adoption rate is also expected to be high. It should be noted that awareness does not just mean that an innovation exists but that it is potentially of practical relevance to the farmers (Barr and Cary, 2000 and Rogers, 2003). Being aware of an innovation is not enough but farmers must have access to such innovations. According to Adu (2005), the first stage towards the adoption of an innovation is to become aware that it exists.

Table 5: Respondents' Awareness of Forestry-related Technologies

	Frequency	Percentage	Frequency	Percentage
Alley Farming	370	83.3	74	16.7
Woody Perennial	295	66.4	109	24.5
Windbreaks	407	91.7	27	6.1
Erosion control	307	69.1	27	6.1
Borderline planting	408	91.9	36	8.1
Taungya	387	87.2	77	17.3
Woodlot development	306	68.9	128	31.1
Fruit tree raising	239	53.8	205	46.2
Trees in soil conservation	335	75.5	109	24.5
Improved fallow	403	90.8	41	9.2
Roadside planting	132	29.7	312	70.3
Fuelwood production	396	89.2	48	10.8

X Awareness Score = 10.18

The result of correlation analysis shows that a significant relationship exists between information sources and awareness of FRT ($r= 0.40$, $p< 0.01$). The null hypothesis is therefore rejected. This suggests the importance of information sources to awareness. If the source of information on FRTs is not well harnessed, it may not achieve the desired objective of creating awareness. For instance, the media (radio) and the extension agents are important sources in creating awareness (Azeez, 2002). However, in this study, none of the respondents got information on FRTs from extension agents (Table 2). Also, it would be expected that contact farmers should be good sources of information but findings of this study reveal that only a few respondents got information from contact farmers while most of the respondents obtained their information from forestry staff. This is an indication of inadequate sources of information.

Conclusion

From the findings of this study, it could then be deduced that majority of the respondents were males, agile and had no-formal education. The major sources of FRT information were forestry staff and relatives. Based on these findings, it was therefore recommended that information dissemination on FRTs should not be left to FRIN alone, but it should be a collaborative effort of the ADPs and the extension division of forestry-based organizations (FRIN, State Ministries of Forestry, NGOs etc). Moreover, technology transfer, particularly FRT transfer, should be viewed as a “total system” that includes both products and services and development of human capacities, information networks and organizations and as such, attention should be focused on the provision of adequate information sources to create awareness in farmers and other end users. Finally, meetings should be held with farmers who had exhibited low awareness of FRTs in order to create in them the awareness.

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Use of Information Communication Technologies (ICTs) among Researchers, Extension Workers and Farmers in Abia and Enugu States: Implications for a National Agricultural Extension Policy on ICTs

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Abstract

The study ascertained the level of usage as well as constraints to the use of information communication technologies (ICTs) among major stakeholders in the agricultural development process in Abia and Enugu States of Nigeria. Data for the study were generated from a sample of 110 respondents using structured interview schedule and questionnaire. Findings indicate that majority (52.5%, 57.5% and 56.7%) of researchers; extension workers and farmers had high, moderate and low knowledge levels of available ICTs, respectively. Out of 24 information communication technologies in use among the respondents, 11 were frequently utilized by researchers, while only 4 and 3 of the facilities were frequently utilized by extension workers and farmers, respectively. The study revealed major constraints to the use of ICTs to include lack of sufficiently trained computer personnel, lack of confidence in operating modern ICTs, erratic and fluctuating power supply, poor finance, lack of internet access in the rural areas and high cost of ICTs hard and soft wares, among others. The study concludes with the need to have a National Agricultural Extension Policy on the use of ICTs with major emphasis on access, availability and use.

Key words: *Information communication technologies, knowledge, access, constraints, policy needs.*

1.0 Introduction

There is scarcely a field of human activity today that has not been touched by the dramatic changes in Information and Communication Technologies (ICTs) that have taken place in the last 10-15 years. The Academy for Educational Development and Winrock International (2003) defines information and communication technologies as the combination of hardware, software, and the means of production that enable the exchange, processing, and management of information and knowledge. Information communication technologies thus include technologies and methods for storing, managing, and processing information (e.g., computers, soft wares, digital and non-digital libraries) and for communicating information such as mail and email, radio and television, telephones, cell phones, pagers, instant messaging and "the web." However, in everyday speech, ICTs commonly refer to electronic and digital devices and the software used for storing, retrieving, and communicating information.

Information Communication Technologies have unique features that provide opportunities to harness them in ways that are different from how the traditional media have been used for development. According to Michiels and Van Crowder (2001), in comparison with traditional media, ICTs can offer opportunities for two-way and horizontal communication and for opening up new communication channels for rural communities and the intermediaries and development organizations that support them. Once mastered, they potentially allow every user to be a sender, receiver,

'narrowcaster' and broadcaster; support bottom-up articulation of development needs and perceptions, and facilitate the merging of global and local knowledge and information, support, create and strengthen interactive and collaborative networks that enable information to flow to and from rural communities; facilitate dialogue between communities, intermediaries and development organizations; foster coordination of national and local development efforts; and overcome physical barriers to knowledge and information sharing. ICTs can also enhance the capacity of grassroots organizations to make their voices heard. ICTs improve the ability to search for information and increase the quantity of information available, ultimately reducing uncertainty and enhancing market participation. Answers to question such as "how do buyers and sellers find each other and what price can be achieved?" and "is it better to store the produce or sell it immediately?" can be easily achieved through the use of ICTs (Bertolini, 2004). ICTs also present new opportunities for individuals and communities to be not only consumers but also producers of information.

According to CTA (2000) efficient information dissemination remains the key to bridge the gap between developed and underdeveloped countries. This is the challenge that confronts development actors and stakeholders in developing countries. Information and the technologies that facilitate its use, exchange, and reliability have been important aspects of agriculture and agriculture-related natural resource management for centuries. Decisions on what to plant, when to plant it, how to cultivate and harvest, and where to store and sell and at what price to sell, have long depended on knowledge, communication, and information exchange.

Agricultural extension, which depends to a large extent on information exchange between and among farmers on the one hand, and a broad range of other actors on the other, has been identified as one area in which ICTs can have a particularly significant impact. There is growing recognition that farmers and members of rural communities have needs for information and appropriate learning methods that are not being met (Greenridge, 2003; Lightfoot, 2003), and these have been lacking in Nigeria. In the midst of this change, extensionists are grappling with the question of how best to harness information and communication technologies (ICTs) to improve rural livelihoods. Meera *et al* (2004) had noted that as a result of the emerging new paradigm of agricultural development, old ways of delivering important services to citizens are being challenged; traditional societies are also being transformed into knowledge societies all over the world

Studies have shown that agricultural development in Nigeria and other African countries have been hampered by low level of agricultural information exchange. Arokoyo (2003) reported that in Nigeria, the national extension service is based on the T&V delivery system, traditionally supported by mobile cinema, video, television, radio and telephone being the only ICT used by majority of extension workers. However telephone use in extension delivery even with the launch and explosion of the global system of mobile communication (GSM) is very limited as most ADPS even at the headquarters do not have functional lines (Agwu and Chah, 2007). The serious limitation of access to reliable telephone line makes even ordinary intra and inter organization networking for information exchange a harrowing and frustrating experience. The vision of the public agricultural extension system in Nigeria is that there should be a media sub-unit within agricultural sub programmes equipped with modern communication facilities for effective communication both within the organization and to link research institutes, related agencies and farmers. Therefore, this study focused on assessing the level of usage as well as constraints to the use of ICTs among researchers, extension workers and farmers in Abia and Enugu states of Nigeria.

Objectives of the Study

The broad objective of this study was to ascertain the level of usage as well as constraints to the use of information communication technologies (ICTs) among major stakeholders in the agricultural development process in Abia and Enugu States of Nigeria. The specific objectives were to:

1. ascertain the knowledge, awareness and access to information communication technologies among researchers, extension workers and farmers;
2. identify the available ICT facilities and their frequency of usage; and
3. determine the constraints to the use of ICTs in agricultural development process as perceived by the researchers, extension workers and farmers.

2.0 Methodology

The study area

This study was carried out in Enugu and Abia states of Nigeria. The two states are in the South East agro ecological Zone of the country. The Zone lies between latitudes 4° - 7° N and spreads over a total of 78,612km² representing 8.5% of the country's total land area (Shaib *et. al.*, 1997). It is the most thickly populated zone in the country with a population of 18.9 million (1991 Census) and a density of 241 persons/km², with rural population constituting 60% of the total. The climate is typically equatorial with distinct dry and rainy seasons. The mean annual rainfall varies from 1500mm in the northern fringes of Cross River, Enugu and Anambra States to over 3000mm in the costal areas. Three distinct vegetation types found in the zone are the humid forest, derived savanna and semi montane. The zone is predominantly agricultural with yam, cassava, palm produce and rice being its main products.

Population / Sampling procedure

The target population for this study include researchers (from the National Root Crops Research Institute (NRCRI), Umudike and University of Nigeria, Nsukka) as well as the public extension workers and farmers in Enugu and Abia states. Simple random sampling procedure was used to select 20 researchers each, from the National Root Crops Research Institute, Umudike and Faculty of Agriculture, University of Nigeria. Also, 20 extension workers were randomly selected from each of the public extension organization (Agricultural Development Programme (ADP)) in each of the state. Again, 20 randomly selected farmers from each of the state also participated in the study. In all a total of 120 respondents participated in the study

Data collection/ Measurement of variables

Data were collected through the use of questionnaire. Objective one was achieved by asking respondents questions relating to their knowledge and awareness level on the role of ICTs in agricultural development. Ten questions were asked and a maximum of 1 point was awarded for a correct answer to each question and 0 point for a wrong answer.

The respondents were categorized into 3 groups based on their knowledge level namely:

- a. Low knowledge (for those with 1-3 points)
- b. Moderate knowledge (for those with 4 – 7 points) and
- c. High knowledge (for those with 8-10 points)

Objective 2 was achieved by asking respondents to indicate their frequency of usage of available ICTs, e.g. computer, internet and cell phone. A three-point Likert-

type scale with responses ranging from “never used” to “very often used” and scaled 1 to 3 respectively, was utilized. Objective 3 was achieved by listing 20 possible constraints to the use of ICTs in agricultural development and asking respondents to rate the level of seriousness of these constraints. A 3-point Likert type scale of “very serious”, “serious” and “not serious at all” were used to measure their responses. Responses of the three-point scales were later categorized according to their mean scores. In terms of frequency of usage of available ICTs, mean scores of 2.00 or above were classified as frequently used, while in terms of constraints to the use of ICTs in agriculture, variables with mean scores of 2 and above were regarded as serious constraints to the use of ICTs in agriculture, and variables with mean scores below 2 were regarded as minor constraints. Mean scores and percentages were used to analyze all the data.

3.0 Results and Discussion

Some Selected Characteristics of the Respondents

Gender

Table 1 shows that majority (67.5%) of the researchers were males while the remaining 32.5% were females. Also, 70.0% of the extension workers were males while 30.0% were females. In the same vein, 66.7% of the farmers were males while 33.3% were females. This implies that the researchers and extension workers were predominantly males. This may be connected with the gender disparity found in the public civil service in Nigeria. With the socio-cultural factors that restrict contact between gender in some communities (Arokoyo, Chikwendu, and Ogunbameru, 2002), appropriate use of ICTs in extension delivery could significantly reduce or eliminate such barriers.

Age (years)

Table 1 shows that 40.0% of the researchers were between 30 and 39 years, while 30.0% were within the age range of 40- 49 years. However, only 15.0 % of research workers were between the age of 50 and 59 years. Table 1 also shows that 42.5% of the extension workers were within the age range of 30-39 years, while 32.5% were 40 - 49 years. Only 20.0% of the extension workers were 30 years, while 5.0% of them were 50 – 59 years. The Table further shows that 36.7% of the farmers were between the age range of 40-49, while 26.7% were within 30- 39 years old and 16.7% of them were between the age range of 50- 59. This indicates that the three groups of respondents were predominantly in their middle ages. This trend may have significant implication for ICTs usage since the elderly might be less interested in using hi-tech communication devices and prefer oral to printed information channels which are less efficient (Agwu and Chah, 2007).

Educational qualification

Table 1 further indicates that 37.5% of the researchers had masters degree, 27.5% and 22.5% had PhD and BSc degrees respectively, while the remaining 7.5% and 5.0% had HND and OND, respectively. On the part of the extension workers 35.0% had HND certificates while 32.5% had BSc. Also, 22.5% had MSc degrees while the remaining 10.0% had OND. This indicates that they can harness information and communication technologies (ICTs) to improve rural livelihoods. On the other hand, a greater proportion 33.3% of the farmers had SSCE, while 16.7% had BSc. Also, 16.7% had first school leaving certificates, while 13.3% and 6.7% had OND and M.Sc certificates, respectively. Only about 13.3% had Teachers Grade II Certificate. This findings show that a majority of those involved in farming activities were not graduates and may not fully appreciate the role of information communication technologies in the improvement of agriculture.

Table 1: Percentage distribution of respondents by some selected characteristics

Socio-economic characteristics	Researchers %	Extension workers %	Farmers %
Sex			
Male	67.5	70.0	66.7
Female	32.5	30.0	33.3
Age			
Below 30 years	12.5	5.0	6.6
30-39	40.0	42.5	26.7
40-49	30.0	32.5	36.7
50-59	15.0	20.0	13.3
60 and above	2.5	-	16.7
Educational qualification			
First school leaving certificate	-	-	16.7
Teachers grade II certificate	-	-	33.3
SSCE	-	-	13.3
OND	5.0	10.0	16.7
HND	7.5	35.0	6.7
BSC	22.5	32.5	13.3
MSC	37.5	22.5	-
Ph D	27.5	-	-

Respondents' level of knowledge, awareness and access to ICT facilities

Table 2 shows the respondents' knowledge level of ICTs. A majority (52.5%) of the researchers had high knowledge level while only 7.5% had low knowledge level of ICTs. In the case of the extension workers, majority 57.5% had moderate knowledge level while only 10.0% had low knowledge level. On the part of farmers, majority (56.7%) had low knowledge level of ICTs. This shows that apart from the researchers, the extension workers and farmers need to be trained on the use of ICTs.

Table 2 also shows that majority (72%) of the researchers and extension workers (63%) had high level of awareness of the major ICT tools, while only 41% of the farmers interviewed were highly aware of these tools. It is important to recognize that awareness among policy makers on the potentials of ICTs is a critical element for its development. The Table also shows that 65% of the researchers, 56% of the extension workers and 33% of the farmers asserted that they had access to ICT facilities. The fact that majority (67%) of the farmers do not have access shows that most rural areas in Enugu and Abia states don't have access to major ICT facilities and so are not likely to be aware of major agricultural findings. According to UNDP (2001) the problem of underdevelopment is attributable to the inability of a large portion of the world's population to access and effectively use ICTs.

Table 2: Distribution of respondents by their knowledge, awareness and access levels of ICTs

Variables	Researchers %	Extension Workers %	Farmers %
Knowledge Level			
High knowledge	52.5	32.5	16.7
Moderate knowledge	40.0	57.5	26.7
Low knowledge	7.5	10.0	56.7
Awareness level			
High awareness	72	63	41
Not aware	28	37	59
Access Level			
Access	65	56	33
Limited access	35	44	67

Use of Information Communication Technologies among Respondents

Data on Table 3 show that out of 24 ICT facilities listed, 14 facilities were frequently used by the researchers and these facilities include Internet ($\bar{x} = 2.25$), Television set ($\bar{x} = 2.07$), Voltage stabilizer ($\bar{x} = 2.17$), Radio set ($\bar{x} = 2.25$), Printer ($\bar{x} = 2.02$), Flash drive ($\bar{x} = 2.10$), Diskette ($\bar{x} = 2.20$), Computers ($\bar{x} = 2.20$), UPS ($\bar{x} = 2.08$), Mobile phone ($\bar{x} = 2.58$), and E-mail ($\bar{x} = 2.30$).

On the part of the extension workers, only 4 out of the 24 facilities were frequently used by extension workers and these include Video player ($\bar{x} = 2.00$), T.V ($\bar{x} = 2.10$), Radio set ($\bar{x} = 2.58$) and Mobile phones ($\bar{x} = 2.55$), while the other ones were not frequently used. This shows a very low level of digital ICTs utilization by the extension workers, especially the computer facilities. Seepersad (2003) reported that cell phones are fairly common among extension employees but however added that cell phones have not been used in an organized way by agricultural organizations. Yekinni and Olaniyi (2007) also reported that majority of the research and extension personnel in Southwestern Nigeria never used video, CD-ROM technology, organizational e-mail, organizational website and personal website in their work schedule.

On the part of the farmers, only 3 facilities were used frequently and they include: T.V ($\bar{x} = 2.20$), Radio ($\bar{x} = 2.57$) and Mobile phones ($\bar{x} = 2.03$). This also shows a very low level of utilization of digital ICT facilities by farmers in the two states. This implies that a large majority of the extension personnel and farmers will not have access to many useful materials found in the internet. The internet is a formidable source of information on recent developments in the field of agricultural extension (Agwu and Chah, 2007). However such information can only be available to those who source for it. These findings generally indicate the low digital ICT-readiness of major stakeholders in the agricultural development process of the country and points to the need to entrench ICTs access, availability and use mandates into policies establishing the national extension system.

Table 3: Respondents' mean ratings on extent of use of ICT facilities in Enugu and Abia States

ICT Facilities	Researchers		Extension workers		Farmers	
	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD
Internet	2.25	0.870	0.98	1.050	0.63	1.033
Intranet	0.65	0.893	0.05	0.221	0.10	0.548
Video recorder	0.77	1.050	1.82	1.023	0.83	1.085
Video player	1.48	1.062	2.00	1.013	1.57	1.278
Slide projector	0.75	0.670	0.73	0.877	0.13	0.346
Film projector	0.53	0.679	0.57	0.781	0.17	0.592
Multi-media projector	0.60	0.778	0.18	0.385	0.03	0.183
Magnetic board	0.93	1.185	0.45	0.639	0.13	0.346
Television set	2.07	1.163	2.10	1.150	2.20	1.064
Camera	1.28	1.062	1.40	1.128	0.90	1.213
Voltage stabilizer	2.17	1.107	1.70	1.203	1.38	1.399
Radio set	2.25	1.056	2.58	0.781	2.57	0.971
Printing machine/ printer	2.02	1.165	1.30	1.203	0.86	2.117
Scanner	1.08	0.917	0.33	0.656	0.37	0.890
Flash drive	2.10	1.033	0.60	0.900	0.43	1.006
Diskette	2.20	0.966	0.60	0.778	0.60	1.070
Computers	2.20	1.067	1.48	1.132	0.60	0.932
CD-ROMs	1.80	1.159	0.83	0.958	0.50	1.009
DVD	1.33	1.347	0.45	0.846	0.40	0.894
Fixed telephone	1.70	1.159	0.75	1.080	0.83	1.262
Photocopier	1.92	1.071	1.33	1.071	0.97	1.129
Uninterrupted Power Supply	2.08	1.095	1.00	1.109	0.93	1.230
Mobile phone	2.58	0.747	2.55	0.815	2.03	1.299
E-mail	2.30	0.966	1.45	1.239	1.27	1.285

Constraints to the use of ICTs in agriculture

Data in Table 4 show that out of the twenty possible constraints listed in the study, eight were considered to be serious constraints to the use of ICTs in agriculture by researchers. These include lack of communication infrastructure on which ICTs depend ($\bar{x} = 2.00$), lack of sufficient trained computer personnel ($\bar{x} = 2.03$), erratic power supply ($\bar{x} = 2.55$), poor finance ($\bar{x} = 2.32$) and lack of internet access in the rural areas ($\bar{x} = 2.60$). Others include; poor communication network ($\bar{x} = 2.10$), high cost of ICTs soft ware ($\bar{x} = 2.00$) and high cost of ICTs hard ware ($\bar{x} = 2.08$). It is generally agreed that ICTs access unevenly favour urban and wealthy residents. Arokoyo (2003) had earlier observed that the adoption and utilization of ICTs in agriculture are constrained among other problems by inadequate infrastructure, limited human resource capacity, absence of national policies and low ICTs literacy.

On the part of the extension workers, twelve out of the 20 statements were considered as serious constraints to the use of ICTs. These specific constraints perceived by extension workers include; lack of competence in handling ICT facilities ($\bar{x} = 2.30$), unavailability of hard ware required by modern ICTs ($\bar{x} = 2.00$), erratic power supply ($\bar{x} = 2.03$) and lack of communication infrastructure on which ICTs depend ($\bar{x} = 2.03$). It is important to recognize that availability and affordability of telecommunications infrastructure and support for rural communities, researches and extension organizations is generally lacking in Nigeria. Specifically, the availability of equipment including phones (fixed and mobile), computers, radio, TV, video camera, a

robust telecommunication system, preferably with reliable broad band with easy internet access and assured operation funds are not affordable by majority of stakeholders found in the agricultural sector, even when available. Other constraints include lack of sufficient trained computer personnel ($\bar{x} = 2.00$), poor finance ($\bar{x} = 2.48$), lack of adequate awareness about ICTs ($\bar{x} = 2.28$), lack of internet access to the rural areas ($\bar{x} = 2.45$), poor communication network ($\bar{x} = 2.23$) and nature of information provided ($\bar{x} = 2.30$).

The farmers also considered 12 constraints as major constraints to the use of ICTs. These include lack of confidence in operating ICT facilities such as computers ($\bar{x} = 2.40$), lack of competence in handling ICT facilities ($\bar{x} = 2.33$), lack of adequate time for training on ICT facilities ($\bar{x} = 2.33$) and unavailability of hardware required for modern ICTs ($\bar{x} = 2.23$). Others include; lack of communication infrastructure on which ICTs depend ($\bar{x} = 2.20$), lack of computer trained personnel ($\bar{x} = 2.20$) and erratic and fluctuating power supply ($\bar{x} = 2.70$). However, electricity and power supplies are absolute prerequisites to using contemporary ICT systems. Bertolini (2004) had earlier observed that several obstacles hinder ICTs usage in developing countries, especially in areas of access to telephone and electricity networks. According to the Academy for Educational Development and Win rock International (2003) over 1.5 billion people in developing countries lack relatively inexpensive grid or 'mains' electric service, and over a billion people will continue to lack grid electricity for the foreseeable future. For these people, other energy options such as small renewable energy-based power systems (solar photovoltaic (PV), small wind-electric turbines), are essential if they are to benefit from rural ICTs use. Other constraints include complexity in using ICTs ($\bar{x} = 2.23$), lack of internet access to the rural areas ($\bar{x} = 2.00$), nature of information provided ($\bar{x} = 2.43$), high cost of ICT software ($\bar{x} = 2.43$), and high cost of ICTs hardware.

Table 4: Mean scores of constraints that hinder the use of ICT in agriculture

Constraints	Researchers (\bar{x})	Extension workers (\bar{x})	Farmers (\bar{x})
Lack of confidence in operating ICT facilities such as computers, CD Rom	1.50	1.78	2.40*
Lack of competence in handling ICT facilities	1.78	2.30*	2.33*
Lack of adequate time for training on ICT facilities	1.60	1.90	2.33*
Unavailability of hard required by modern ICT	1.90	2.00*	2.23*
Lack of communication infrastructure on which ICTs depend on	2.00*	2.03*	2.20*
Fear that things will go wrong in using ICT	0.78	0.62	1.37
Inappropriate contents of ICT messages that do not meet the needs of clients	0.77	0.87	1.37
Poor benefits in using ICT	0.70	0.85	1.63
Lack sufficient trained computer personnel	2.03*	2.00*	2.20*
Erratic and fluctuating power supply	2.55*	2.38*	2.70*
Poor finance	2.32*	2.48*	1.77
Lack of adequate awareness about ICT	1.90	2.28*	1.93
Complexity in using ICT	1.80	1.85	2.23*
Lack of internet access in the rural areas	2.60*	2.45*	2.00*
Poor communication network	2.10*	2.23*	1.80
Nature of information provided	1.85	2.00*	2.43*
High cost of ICT soft ware	2.00*	2.72*	2.43*
High cost of ICT hard ware	2.08*	2.30*	2.43*
Negative attitude of people to change	1.88	1.55	1.30
General lack of awareness of the importance of ICT in agriculture	1.90	1.70	1.73

* *Serious Constraints*

Implications

Ghana perhaps appears to be one of the foremost countries to adopt ICTs in its National Agricultural Research System (NARS) in the West African sub region. Researchers in the Ghanaian NARS are using computer and internet – based ICT to communicate with each other and to carry out some important aspects of their research activities (Sraku – Iartey and San, 2003). It is suggested that by 2010, ICT in Ghana will be used to conduct researches. According to Global Watch (2002) it will be used in extension activities through the establishment of information centres and tele-centres and will facilitate collaborative research through the use of local area networks, wide area networks and research networks due to more inter disciplinary research.

However, in Nigeria, weak and inadequate legal framework on the use of ICTs in extension service has slowed down the agricultural development process. It thus becomes important to understand the specific actors who play (or should play) a role in establishing basic ICTs services in rural areas. Identifying the actors can help orient projects and programmes that would lead them to effectively and collectively engage in dialogue around telecommunications policy reform. These actors according to Richardson (2003) include:

1. Telecommunications service providers (also known as operators)
2. Regulators and policy-makers

3. Telecommunications policy reform advocates (most often found in, and focused on, urban service issues, and sometimes nascent in rural areas)
4. Rural clients (current and potential)
5. 'Last mile' entrepreneurs – phone shop operators and cyber café / telecentre operators
6. Extension managers and other professionals who deliver rural services.

There are many uses for ICTs for facilitating communication, information and advocacy services in the context of improving rural livelihoods, however connectivity constraints in rural areas is still an enormous barrier to the uptake of even basic ICTs. In that regard, extension has an important role to play in facilitating and brokering the participation of rural and agricultural organizations in policy dialogue on telecommunications reform in order to shape national telecommunications policies and programmes to meet the needs of rural areas (Richardson, 2003). This is a very new role for extension. In this role, they must be able to examine the appropriateness of various ICTs, the accessibility of ICTs in rural and remote areas, how best to reconcile costs and benefits, and how to insure that ICTs access include a diversity of cultures, languages, social strata, and age groups, and is gender sensitive (Richardson, 2003).

In conclusion, if modern ICT facilities are not adequately built into the mainstream of Nigerian agricultural extension system, there is likely to be stagnation in the dissemination, utilization and application of scientific agricultural information for purposeful development of the system. Presently in Nigeria, agricultural extension professionals are often absent from national policy dialogues that help create and/or shape positive policy change towards universal ICTs access. If they are not part of national policy dialogue, universal access policies, programmes and regulatory reform initiatives risk neglecting the needs of the very people the initiatives are meant to serve. Information Communication Technologies access implies not only the physical availability of communication equipment and methods but also the existence of the right conditions for their use in getting information. These conditions include the ease of use of the technologies, regular electric power supply and availability of spare parts. In this regard, government should take steps to build three basic infrastructures in the rural areas: electricity, telephone and internet connectivity.

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Analysis of Farmers' Access to and Perception of Extension Service Delivery in Borno State , Nigeria

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Abstract

This study analysed access to and perception of private extension delivery by farmers in Borno state. Primary data were collected from 128 farmers selected using multi-stage sampling technique. A five point Likert type scale was developed and used to elicit information on respondents' attitude toward private extension service delivery. The collected data were analysed using descriptive statistical techniques such as frequency counts and percentages. Result indicated that majority (63.3%) of the respondents were between the ages 36 and 50 years with high proportion (70%) cultivating not more than 4 hectares of land. The study further revealed that majority (84%) had access to public extension service with only 43% having access to private extension. Most of the respondents expressed positive attitude towards privatization of extension services. Based on the findings of the study, it was recommended that rural areas should be provided with social and economic infrastructure and private extension services be encouraged in rural areas.

Introduction

The importance of agricultural extension in agricultural development is widely acknowledged, particularly in developing countries such as Nigeria where the. Wanga (1999) opined that in most developing countries, agriculture is the main source of livelihood. In addition, Nambiro et. al. (2006) observed that since Kenya 's independence in 1963, agricultural extension services have largely been provided by government. This is equally true in Nigeria where public participation has been into all aspects of this economy including direct agricultural production (Adedoyin, 2004; Ozor and Madukwe, 2004).

The current trend in extension is tilting towards reduced emphasis on uniform message as provided by the Training and Visit (T&V) system but rather to involve other stakeholders (including farmers and private sector) in gaining more ground (Robert and Rober,2003). Private participation or outright privatized extension has been the subject of widespread discussion by those considering the challenges of providing an efficient agricultural extension system for farmers in developing countries(Kidd et. al., 2000; Rivera, 2001; Katz, 2002). Privatized extension can take many forms and it has become clear that it does not represent a simple undifferentiated alternative to the public extension system it is expected to replace (Anderson and Crowder, 2000).

Although the private extension initiatives offer many opportunities for large scale farmers, there is less certainty about the implication for the resource –poor farmers, whose connection to, and command of, market is much more tenuous (Robert and Robert, 2003). Such observation is much stronger given that many of the resource–poor farmers have been poorly served even by the public sector extension (Ozor and Madukwe,2004); Omotayo and Arokoyo, 1990). Does a call for privatization of extension imply any greater hope for them? Can private extension initiatives serve the needs of commercial farmers in order to strengthen agricultural market forces desirable economic development and accommodate the resource-poor farmer? In other words, can private extension outfit guarantee accessible and efficient services to all categories of farmers by redressing the uses of defective capital structure, excessive

bureaucracy, inappropriate technology, management and blatant corruption which seem to characterize public extension outfit? These are the questions that are to be addressed by this writeup

Objectives

The main objective of this study was to determine farmers' access to and perception towards private extension service in Borno state. The specific objectives were to;

- (i) determine the socio-economic characteristics of farmers in the study area;
- (ii) determine the types of extension service providers in this study area;
- (iii) determine accessibility to private extension service by farmers with study area;
- (iv) determine the farmers' attitude toward private extension service delivery in the study area.

Methodology

The study was conducted in Borno State, Nigeria. The state has three Agricultural Zones namely Biu, Bama and Kukawa Zones. Bama Zone was purposively selected for the study because the zone was created at the on-set of the Agricultural Development Programme (ADP) System in the former Borno State which now form Borno and Yobe States . The zone also serves as the state ADP headquarters since Maiduguri the state capital which hosts the ADP headquarters is also located in this zone. The zone is made up of eight (8) Extension Areas, (16) Extension Blocks and 128 Extension Circles. Using multistage random sampling technique, 4 Extension Areas were randomly selected out of the 8 Extension Areas in the Zone. In the second stage of the selection, 2 Extension Blocks were randomly selected from each of the 4 selected Extension Areas giving a total of 8 Extension Blocks used for the study. Each of the 8 Extension Blocks has 8 Extension Circles, giving a total of 64 Extension Circles used for the study. From each of the 64 Extension Circles, 2 farmers were randomly selected giving a total of 128 farmers used for the study.

Interview schedule was used to obtain information from the respondents. Information was sought on the sources of extension information available (private or public) to the farmers. A five point Likert type scale was developed and used to elicit information on the appropriateness of public and private extension outfit in the provision of services to farmers, as used by Ozor and Madakwe (2004).

3.0 Results and Discussion

3.1 Socio Economic Characteristics of Respondents

Table 1 revealed that majority (63.3%) of the respondents fall between 36 and 50 years of age, with about 70% having educational qualification not beyond the primary school level. This means that more than half of the respondents are youth and have received certain level of educational training. These have implications for demand driven extension as Nambiro, et al (2006) put it that age and literacy level have a significant impact on the likelihood of farmers seeking and receiving demand driven extension service, which is essential in privatized extension service. The study also showed that most of the respondents are small-holder farmers with about 70% cultivating not more than 4ha of land. The same thing applies to income. Half (50%) of the respondents earn not more than N200,000:00 per annum. Both farm size and level of income positively affect accessibility to extension service as previous studies (Nambiro, et al, 2006; Alax, et al; 2002; Byerlee and Echeverria, 2002) opined that private agricultural extension is intimately associated with large scale commercial farming. In a particular study in Germany (Robert and Robert, 2003), the proportion of farmer seeking extension advice fell from 80% to 13% when extension service was privatized and the majority those who

patronize the advisory services were farmers cultivating over 500ha. Onu (2006) also reported that farm size significantly influence both farmers' adoption decision and accessibility to extension service. This implies that majority of the farmers in the study area may not be able to afford extension service under the privatized regime since a vast majority have small land holding. The finding is also particularly implicative for Nigeria, with more than half of her citizen living below the poverty line and more than 70% of the farmers operating at peasantry level (Olowoye, 2004).

Table 1 also shows that 68% of the respondents are members of registered farmers' associations. This can facilitate their accessibility to private extension as the effect of membership of farmers' cooperative society on accessibility to private extension services appreciably high (Birkhaeuser, 1991). Also, more than 70% of the respondents reported that they reside at a distance of more than 10km from the closest source of private extension services. Households that are located further away from town centers, which would require extension agents to spend more time and fuel resources to access are less likely to be visited (Nambiro, et al, 2006). In a related study, Carney (1998) opined that, farmers living in areas with decentralized extension services are more likely to access such services. This coincides with the general opinion that when farmers have extension opportunities open to them, they are better placed to actively participate in seeking such service. However, the result provides an indication that a vast majority of the resource-poor farmers in Nigeria, who are mostly resident in the rural areas may not benefit equitably from such advisory services despite the raging debate on its benefit.

Table 1: Distribution of Respondent According to Socio-economic Characteristics

Socio-economic Variable (x)	Frequency (n)	Percentage (%)
Age (years)		
Less than 35	31	24.0
36 – 50	81	63.3
Above 50	16	12.7
Educational Level		
No formal education	48	29.7
Primary school education	50	39.1
Secondary school education	37	28.9
Tertiary education	03	2.3
Farm Size (ha)		
Less than 2 ha	32	25.0
2 – 4 ha	58	45.3
5 – 7 ha	25	19.5
More than 7 ha	13	10.2
Level of Income (Per annum)		
Less than N100,000=00	12	9.4
N100,000 – N200,000=00	52	40.6
N200,000 – N300,000=00	38	29.7
More than N300,000=00	26	20.3
Membership of farmers corporative		
Yes	87	68
No	41	32
Distance from source of private extension service (km)		
<5km	15	11.7
5-10km	21	16.4
11-15km	48	37.5
16-20km	32	25.0
>20km	12	9.4

Source: Field Survey, 2007.

Type of Extension Services Received and Crop Grown

Table 2 revealed that more than eighty (80%) percent of the respondents had access to public extension service while less than half (43.8%) had access to private extension service. Out of those who had access to private extension service, about 80% are resident in the urban towns of Maiduguri and Bama, while most of them are either large scale farmers or cash crop farmers mostly engaged in Dry season farming. This also portrays

the biased nature of private extension services in favor of the large scale and/or urban based farmers.

Result on the type of farming also indicates that 68% of the respondents are engaged in the production of food crops mainly millet, sorghum and groundnuts, while about half (50.8%) are engaged in cash crop production, mainly cowpea, onion, pepper and carrot. Here also, most of the farmers patronizing private extension services are cash crop farmer in the urban/peri-urban centers. Omotayo and Arokoyo (1990) pointed out that generally, most private organization do not provide extensive service on a country-wide basis. They concentrate their services in areas which have favorable physical environment and satisfactory infrastructure. Again, private organizations are often involved in the promotion of cash crops at the expense of food crops. Relevant examples are cotton and tobacco whose production have received vigorous boost over the years due to services provided by private extension services (namely AFCOT and NTC). This trend will further frustrate the attempt to up grate the subsistence food production.

Table 2: Distribution of respondents according the type of extension service received (public or private)

Type Of Extension Service	Frequency	Percentage(%)
Public	108	84
Private	56	43.8
Type of farming		
Food crop farming	87	68.0
Cash crop farming	65	50.8

- multiple responses existed sum of % >100
- Source: Field Survey, 2007.

Farmers' Access to Private Extension Services

Among the few that had access to private extension services, about half (42.9%) had the access on weekly basis, and another 35.7% accessed the service at least once every fortnight (Table 3). This also justifies the biased nature of private extension service. The fact that more than three-quarters (78.6%) of the eligible population could access the service highly contrasts with the average accessibility of public extension service where more than half (58% had access to extension service once in a month (Idrisa and Ogunsbameru, 2004).

Table 3: Distribution of Respondents according to access to private extension services.

Access to private extension service	Frequency	Percentage (%) as of those who have access (56)	Percentage as of whole sample (128)
Weekly	24	42.9	18.8
Once in two weeks	20	35.7	15.6
Once in a month	8	14.3	6.3
Irregular	4	7.1	3.1
No access	108	192.9	84.0

Source: Field Survey, 2007

Attitude of Respondents toward Private Extension Services

Analysis of the attitude of farmers toward private extension services indicates that most of the farmers are in support of privatizing agricultural extension services. For instance, more than half (53.1%) of the respondents indicated that privatization of extension will bring about higher frequency of contact between farmers and extension agents. This may be because if farmers actually contribute to extension services, they will watch out to ensure that extension agents justify the farmers' investment by visiting them more regularly. The percentage distribution of respondents who strongly agree or agree that there is going to be improvements in provision of appropriate technical information, timely and affordable input accessibility and accountability in extension delivery following privatizations are 62.5%, 79.7% and 84.4% respectively as can be seen in Table 4. All the above can be explained by the fact that privatization will lead to participation of farmers in monitoring of extension activities with a view of seeing that they get value for their resources. This further corroborates earlier studies (Farrington, 1994; Rolling, 195 Coldevin, 2000) that an environment characterized by dwindling government budget and waning donor interest lead to significant decline in public extension services while Suleiman (2003) suggested that one major advantage of privatized extension service is that it involves broad based and knowledgeable participation from farmers themselves in terms of planning and monitoring. Similarly, Schwartz (1994) opined that privatized extension functions better than the public extension because extension assumes that the farmers will articulate their needs, they manage and enforce contract with private extensions provider and also evaluate the result of such contract. Ideally, this strategy not only eases the delivery of extension messages to farmers, but also makes extension service more appropriate and responsive to their needs.

Table 4: Distribution of respondents according to the attitude towards privatization of extension services.

Statement	Responses		Categories		
	SA	A	UD	D	SD
Privatization can bring higher frequency of contact with extension agents	38(19.7)	30(23.4)	40(31.2)	15(11.7)	5(4.0)
Privatization will bring more appropriate technical information	45(25.2)	35(27.5)	2(1.6)	36(28.1)	10(7.8)
Privatization will bring about timely and affordable input accessibility	34(26.6)	68(53.1)	15(11.7)	10(7.8)	1(0.8)
Privatizations will bring about accountability and efficiency in extension service	50(39.1)	58(45.3)	10(7.8)	4(3.1)	6(4.7)
Privatization will lead to deprivation the resource poor farmers	15(11.7)	10(7.8)	40(31.2)	50(39.1)	13(10.2)

N.B. Values in bracket are percentages.

Source: Field Survey, 2007.

About half (49.3%) of the respondents also disagree that privatization of extension will lead to deprivation of the resource-poor farmers. Although Suleiman and Van den Ban (2003) are of the opinion that the demise of public extension may be seen as abandonment of the cause of the resource-poor farmers, probably because agricultural extension has come to be so firmly associated with the public sector, particularly in the developing countries, the view of the respondents indicates that such fears are

unwarranted. The result also supports earlier findings (Roberts and Robert, 2003; Katz, 2002) that, private extension alternatives have been debated and developed precisely because of concerns about the poor performance of public extension, including its inability to consistently deliver useful information to the resource-poor farmers.

Conclusion

Majority of farmers aged between 30 to 50 years, with low levels of education and cultivating less than 4 hectares of land. Incomes among the farmers were generally low, with about half earning not more than #200,000.00k per annum. It is also the conclusion of this study that private extension is more popular with large scale or cash crop farmers, most of who are urban-based. If deliberate steps are not taken, the rural-based peasant farmers, who produce bulk of the agricultural products used in this country may be deprived. However, among those who had access to the private extension services, frequency of contact with extension agents and delivery of appropriate technologies have been enhanced significantly, with majority having contact with extension agents at least once in a fortnight. Overwhelming majority of the respondents also have positive attitude towards privatization of extension services because they believed that privatized extension service can, and will bring about farmers' participation in extension planning and monitoring.

From the analyses of the study, the following recommendations are hereby proffered:

1. Private extension should be encouraged to serve food crop farmers who are essentially subsistent in operation, at least at the initial stage so as to expose them to the benefits of private extension.
2. Private extension outfits should be encouraged to reach out to rural areas where majority of the farmers live and work, rather than limiting their services to the urban and peri-urban.

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Analysis of Students Industrial Work Experience Scheme (SIWES) in NIFFR and the Challenge of Skilled Fishery Extension Manpower Development in Nigeria

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Abstract

The study examined Student's Industrial Work Experience Scheme carried out in NIFFR visa-a-vise the challenge of skilled manpower development for fishery extension. Secondary data collected from NIFFR library and report of 2007 SIWES period was analysed descriptively. Out of 617 students from 36 schools that visited NIFFR, 282 (46%) were for IT from 16 tertiary institutions in the six geo-political zones. Over 80% of the IT students were University students in the department of fisheries dominated by institutions in the South West and North Central zones. SIWES students spend 2-32 weeks to acquire skills and practical knowledge in different aspects of fisheries like artisanal, aquaculture & biotechnology, fish technology, environmental studies, and socio-economic/extension. High influx of students in the department of fisheries is an indication that NIFFR adds value to graduates of fisheries. However, it is appalling to note that students of agricultural extension never utilize opportunities existing at NIFFR for industrial training like their counterparts in fisheries department. This is a pointer to a large extent that the challenge of training skilled and competent professionals for fishery agricultural extension is still a mirage rather than a reality. To reverse the ugly trend, students of agricultural extension in various tertiary institutions should be compelled to spend at least two weeks of their IT period at NIFFR for practical experience. This development will be seen as a step in the right direction towards skill development and changing student's perception to seek livelihood in fishery particularly in aquaculture to create jobs and reduce unemployment as well as building competency and confidence.

Keywords: students, niffr, fishery, extension, Nigeria.

Introduction:

One of the critical issues in the seven point agenda of present administration is food security. Realization of food security agenda can be accessed on the performance of agricultural sub sector of the economy to provide food at the right quality and quantity to citizenry with meaningful impact on nutrition, wealth creation, and poverty reduction to improve well being. Extension services delivery in agriculture has a key role to play to make this happen. In this regard, Eremie (2006) enumerated the role of effective extension service as facilitating the development of technology, support its adaptation and adoption by farmers, foster linkages with relevant service providers and institutions and provide feedback for further improvement of the system.

Presently, agriculture extension service delivery is championed by Extension Agents (EAs) of the State Agricultural Development Programme (ADPs) with little contribution from Research Institutions as public providers and Non Governmental Organizations as emerging private providers. Efficiency and effectiveness of ADPs in extension service delivery to farmers reached its peak in the 70s and mid 90s during the period of World Bank assistance. This investment in ADP service delivery and capacity cost World Bank US\$2billion (Eremie, 2006).

Despite earlier impact of the State extension agents in agriculture, it is now characterized by decline in supporting adoption of technologies (Adebayo, 2005 and Oladele, 2005), shortage of agricultural manpower (Olunlade, 1996), low capacity (Moshia, 2006), unskilled graduates (Akpoko, 1998), low ratio of extension agents to farmers (NAERLS and PCU, 2002) and crop and livestock biasness against fishery/aquaculture (Okomoda *et al*, 1996). Also, further evidence by Okomoda (1996) in Nigeria, Gemo (2005) in Mozambique and report of Limpopo Province Department of Agriculture (LPDA) (2005) in South Africa established dominance of agricultural extension profession by Diploma holders (OND and HND) with few university graduates, a situation common in developing countries of Africa. This scenario poses a challenge on the capacity and capability of extension personnel to meet the needs of end users. Hence, there is urgent need to exposure prospective change agents in agriculture to practical training to improve their competency in chosen carrier. This circumstance made Dimelu and Saingbe (2006) to ask; when is it appropriate to acquire the knowledge, skills and re-orient agents/professionals for attitude change in extension work?

However, the issue of agricultural manpower development in terms of shortage, competence and skill is more critical in fishery due to its late introduction in ADPs activities. Consequences of fisheries neglect is manifested in ugly scenario where fish importation dwarf local production from capture and aquaculture as shown in Ifejika *et al* (2008). Also, it is obvious that fish supply from importation and capture cannot guarantee fish food security due to high cost, low per capita fish consumption as well as stagnation and decline in yield. Therefore, filling the gap existing in domestic fish supply shortage put at over 1.6million metric tonnes requires triple intensification of aquaculture practices to meet demand. This is a pointer that we need capable and skilled extension agents in fishery who can deliver the message to end users to produce result. Therefore, effort to increase domestic fish production should start with grooming of skillful manpower in fishery extension as change agents with practical orientation and spirit of entrepreneurship. Oladele and Agbebaku, (2006) asserted that student's farm practical training programmes are fashioned within the principles of entrepreneurial skill development.

In this regard, fisheries research institutions in the country have a vital role to play in practical grooming of agricultural extension students. One of them is the National Institute for Freshwater Fisheries Research (NIFFR), New Bussa, with mandate on freshwater fisheries is probably in a better position to perform this role. NIFFR is a federal government agency obliged by law to accept students on SIWES otherwise known as Industrial Training (IT) in this study. Rising number of students' to NIFFR for excursion and IT from 533 in 2005 to 656 in 2006 and 617 in 2007 is an evidence of active involvement in development of skilled manpower for fishery sub-sector of agriculture. It is expected that extension students in the Department of Agricultural Extension should avail themselves the opportunity at NIFFR to be practically exposed in capture fisheries and aquaculture.

According to National Universities Commission (NUC) document, realization of skill weakness in Nigerian awarding institutions inspired the need to expose students to practical experience to acquire on the job skill training needed to face real work situation. In view of this, SIWES or IT has become one of the minimum academic standards for students to undergo for two to six months. The broad objective of SIWES is to bridge the gap existing between theory and practice in all professions including agriculture as in NUC document. The NUC document further stated that IT in fisheries is designed to make the graduates to enter into fisheries enterprise on their own, accept

assignments in private and public sectors. In accordance with fisheries schedule guideline, IT students at NIFFR are exposed to five technical divisions;

(1). Aquaculture and Biotechnology to learn breeding technique, hatchery management, sex reversal and fish feed formulation water recirculation system management.

(2). In Artisanal Fisheries, IT students are exposed to different fish gears, identification of common fish disease, technique for catch assessment and obnoxious practices.

(3) Environmental Studies groom students on raising of natural fish food (zooplankton and phytoplankton) for fingerlings, water quality management in ponds and control of aquatic weed in water bodies.

(4) In Fish Technology, IT students are exposed to fish processing with smoking kiln and solar tent, fish feed formulation, preservation and quality control.

(5) While Socio-Economics and Extension Services relates to aquaculture practices, packaging of technologies, dissemination of technologies, field trip to fishing communities, feasibility studies, information gathering methods and rural sociology of fisher folks.

It is in against this background that the study seeks to analyze 2007 SEWIS at NIFFR to determine;

- proportion of IT student's among Student visitors to NIFFR;
- categorize IT students based on course of study vis-à-vis zonal distribution; and
- Categorize SEWIS students based on tertiary institutions.

Study Area and Methodology

The forty years fisheries research institute was established in 1968 as a result of Kainji dam construction. It has undergone series of change in nomenclature to be known now as National Institute for freshwater Fisheries Research (NIFFR). It is located in New-Bussa, Niger State, in north central zone of Nigeria. The mandate of NIFFR is on freshwater fisheries which cover socio-economic and extension services, aquaculture and biotechnology, environmental issues, artisanal fisheries and fish technology. In carrying out these responsibilities, NIFFR collaborates with other organizations involved in fisheries development, thus making IT part of institute activities. Data for the study is secondary which was compiled from library and NIFFR records for 2007 SIWES period only. The data were descriptively analyzed as presented in table and figures.

Results and Discussions.

Table one deals with identification of IT students to NIFFR in 2007. Within the period under study, there are two categories of student's visitors to the institute which is either for excursion/field trip or SIWES. Out of 617 students from 36 schools, 282 (46%) are for IT whereas 335 (54%) are for excursion. Report of Ibeun (1996) on decade of NIFFR library use between 1987 and 1996 established students to be institute most valued non-staff visitors. Trooping of students to NIFFR for either purpose is a sign of building students' interest and confidence in fisheries. This development is a step in the right direction towards changing youth perception to seek livelihood and entrepreneurship in fishery particularly aquaculture to create jobs and reduce unemployment.

An entry in table two is on zonal distribution of SIWES students, which reveals wide spread across the six geo-political zones in the country. Out of 16 tertiary institutions that came for IT, South West dominated with 37.4% and followed by North Central (25%). Further revelations confirm that three geo-political zones in the south account for 56.2% of the institutions on IT compared to 43.8% from the Northern zones. It implies that northern states are under utilizing NIFFR resources in their area

for fishery aquaculture development. Also, high influx of institutions from South West and North Central suggests proximity and popularity of the institute in these areas. The trend in SIWES participation is a reflection on level of aquaculture development in the zones which is found to be poor in North West and North East. Above statement is supported in finding on inventory survey of fish farms in Nigeria conducted by FAO (2004).

Data on distribution of IT students based on course of study reveals that a total of 253 (89.8%) students from 14 different institutions in fishery department spent 2 to 32 weeks at the institute. Highest number of students came from Delta State University, Asaba Campus (48), University of Agriculture, Abeokuta (42) and Michael Opara University of Agriculture, Umudike (22). Report of Ibeun (1996) collaborated the finding on dominance of fisheries students from various schools including Abeokuta and Umudike. Other closely related courses taking advantage of the fishery research institute are Biological science and Agricultural education. Sending of student's en masse to NIFFR is a pointer on the quality and level of confidence the schools have on the practical training student's receive over the years. Similar study by Oladele and Agbebaku, (2006) found out that IT has influenced student's choice of livestock/fishery over crop as a means of livelihood. It is surprising that non agricultural extension student from any of the schools benefited in the practical exposure like their counterparts in fishery departments. Overcoming professional deficiency in skill and technical knowledge among extension personnel as observed in fishery can only be solve if agricultural extension students are practically groomed on the basic rudiments of fishery and aquaculture as experienced in NIFFR industrial training or any organized private fish farms with facilities. None utilization of opportunity at NIFFR by agricultural extension students will elude the desire to train competent professionals with skills and right attitude. Emerging facts in the study suggests that Agricultural Extension students are likely to lose fisheries extension works to their counterparts in department of fisheries. Hence, the desire for effective and efficient information dissemination in fisheries will be jeopardized by incompetency and unskilled labour force among extension professionals.

Table four relates to categorization of tertiary institutions in the SIWES in the year 2007. As shown, University account for 84.2% of the institutions with 254 attaches followed by College of Fishery with 22 attaches and two students from College of Education. Dominance of Universities can be trace to their offering of agricultural courses in addition to College of Fishery as a specialist school. High utilization of NIFFR by universities hinges on the fact that research institutions are partners in progress in grooming of students; hence NIFFR is maximized to add value to graduates of fisheries. It is appalling that Student's of Agricultural Extension is yet to explore opportunities existing at NIFFR to gain skill like their counter parts in fishery department. This is a pointer that the challenge of training skilled and competent professionals for fishery agricultural extension is still a mirage rather than a reality to actualize.

Conclusion

In the country, NIFFR is being utilized by universities to add value to quality of graduates in fisheries and aquaculture in terms of knowledge, skill and practical orientation. However, the situation differs with that of agricultural extension due to none utilization of opportunities at NIFFR, New-Bussa. This has serious consequences on the quest to groom competent and skilled professional for fishery sub sector characterized by manpower shortage. In view of this, students of agricultural extension

are advised to spend at least two weeks of their SIWES at NIFFR to gain knowledge, skill and practical experience to boost their competency in fishery and aquaculture.

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Table1. Categorization of student visitors at NIFFR in 2007.

Categories	NO.	%
SIWES	282	46
Excursion	335	54
Total	617	100

Table Two. Geo-political zonal distribution of SIWES students

Zones	%
North East	12.5
North West	6.3
North Central	25.0
South East	6.3
South West	37.4
South-South	12.5

Table3. Distribution of SIWES students based on course of study

Course of study	frequency	%
Fishery/Aquaculture	253	89.8
Biological Science	4	1.4
Forestry/Wildlife	21	7.4
Agric. Science	4	1.4

Table 4. Categorization of SIWES based on tertiary institutions

Institutions	%
University	87.6
College of Fisheries Technology	6.2
College of Education	6.2

Sources: Niffr library & records, 2007.

Confidence of Extension Staff in Akwa Ibom State Agricultural Development Programme

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Abstract

This study assessed the organizational confidence of extension staff in Akwa Ibom state agricultural development programme (AKADEP). The study also determined the relationships between selected personal characteristics and organizational confidence variables of the extension staff. A sample of ninety (90) randomly selected respondents provided information used for the study. Percentages, mean scores and Pearson correlation coefficient were employed in the analysis of data. Majority of the extension agents (EAs), block extension agents (BEAs), block extension supervisors (BESs), and zonal extension officers (ZEOs) were sometimes satisfied with AKADEP as their organization. Age, household size, and years of extension experience of EAs were strong indicators of organizational confidence. Age, level of formal education, household size and extension experience of BEAs were strong predictors of organizational confidence. Age, level of formal education, household size and extension experience of BESs were significantly associated with organizational confidence. Age, household size and years of extension experience of ZEOs were strong indicators of organizational confidence. Policies that would make good and balanced working conditions to be prevalent in AKADEP should be designed. This will promote organizational confidence of extension staff which, in turn, will boost their job performance and ultimately the performance of AKADEP as an extension agency.

Introduction

Nigeria is endowed with abundant natural resources. The agricultural potential of the country is high. One of the most effective means of transforming the potential agricultural resources into sustained agricultural development is effective agricultural extension service (NAERLS, 1997). Effective agricultural extension service depends largely on the effectiveness of frontline extension staff, namely extension agents (EAs), block extension agents (BEAs), and extension supervisors (BEs), who have the mandate to train the farming population. The effectiveness of these crops of workers in turn depends partly on the extent of satisfaction they have with every aspect of the organization. In other words, first-rate quality job performance of field extension personnel is partly dependent on the organizational confidence of these workers.

Employee confidence in an organization could be measured in two aspects, viz, redressal of grievances, and fairness of supervisor's dealings, that is, the degree of satisfaction a worker gets from his dealings with his supervisor (Patel, 1983). Employee grievances, which are dissatisfactions that a staff has against management or dissatisfactions felt by a worker in connection with his work, can be a major reason for poor job performance of staff (Morgan, 1982).

Individual grievances can arise as a result of one employee feeling aggrieved. A staff that feels he has a grievance against a manager, a supervisor or against the organization as a whole is an unhappy worker and an unhappy worker cannot do effective work. He becomes depressed, his morale is low and as a consequence his efficiency reduces. Collective grievances may arise from alleged ill-treatment of an employee, generally a union member or from a disagreement between the local union

representative and management over the interpretation or non implementation of the collective agreement. A grievance, whether real or imaginary, can be the source and the reason for poor job performance of staff (Morgan, 1982).

The characteristics of extension personnel may affect (favour or disfavour) their level of confidence in extension organization. The personal characteristics include age, level of formal education and years of extension experience among others.

The questions which need to be addressed are the organizational confidence of extension personnel and their personal characteristics as they relate to organizational confidence. What is the level of organizational confidence of extension staff? What are the relationships between the personal characteristics of the extension workers and their level of confidence in the extension agency? These questions are relevant to effective agricultural extension services and sustainable agricultural development in general. To provide solution to these questions, this study was designed to assess the organizational confidence of extension staff at the zonal level in Akwa Ibom state agricultural development programme (ADP), as well as determine the relationship between selected personal characteristics and the organizational confidence variables of the extension staff.

Methodology

The study was carried out in Akwa Ibom State of Nigeria. The state is situated within the humid zone and occupies the south east corner of Nigeria (Akpabio *et al.* 2002; Ekong and Olowu, 2002). The target population for this study was the agricultural extension staff at the zonal level in Akwa Ibom state ADP. They are the ZEOs, BESs, BEAs, and EAs.

Multi-stage random sampling procedure was used in the selection of the agricultural zones, blocks, and circles. The first stage involved simple random selection of two agricultural zones in the state under study. Ikot Ekpene and Uyo zones were selected. The ZEOs whose zones were selected served as respondents. The second stage involved simple random selection of seven blocks from each of the agricultural zones. The BESs and BEAs whose blocks were selected served as respondents. The third stage involved simple random sampling of five circles from each of the blocks. The EAs whose circles were selected served as respondents. This gave a total of 2 ZEOs, 14 BESs, 14 BEAs and 70 EAs. Altogether, one hundred (100) respondents made up the sample size for the study. However, 90 copies of questionnaire (2, 4, 12, and 62 copies of questionnaire from ZEOs, BESs, BEAs and EAs, respectively) were found suitable for use in the analysis.

Data were collected through the use of structured questionnaire schedule. Four sets of questionnaire were used to elicit information from EAs, BEAs, BESs, and ZEOs. Questionnaire for the four groups of respondents were designed to collect data on their personal characteristics and organizational confidence.

To assess the organizational confidence of the extension staff, each of the sampled extension staff was asked to indicate the degree of satisfaction he/she derived in each of the 14 organizational confidence statements or items on a five point Likert-type scale. The five points on the scale were graded as follows: 1=Very Dissatisfied, 2=Dissatisfied, 3=Sometimes Satisfied, 4=Satisfied and 5= Very Satisfied. The mean degree of satisfaction for each of the 14 different organizational confidence statements or items for EAs, BEAs, BESs, and ZEOs was calculated by dividing the total satisfaction score by the number of respondents respectively. The organizational confidence level for each group of respondents was computed by dividing the grand mean satisfaction score of each group by number of the organizational confidence items (14).

Percentage and mean scores were utilized for data analysis. The correlation statistics was used for determining the relationship between selected personal characteristics and organizational confidence variables of extension staff at 0.05 level of significance.

Result and Discussion

Information was collected on the age, level of formal education, household size, and years of extension experience of the four groups of respondents in order to determine the relationships between the personal characteristics and organizational confidence of these respondents. The percentage scores of the selected personal characteristics are briefly summarized below. The organizational confidence of EAs, BEAs, BESs, and ZEOs are presented in Tables 1 to 4 respectively. The relationships between the selected personal characteristics and organizational confidence variables of the four groups of respondents are tested in Table 5, 6, 7 and 8.

Personal Characteristics

About 60.0% of the EAs compared with 67.0% of the BEAs were in the age range from 30-39 years. Sixty four percent of the BESs fell within the age bracket of 40-49 years. Fifty percent of the ZEOs were in the age range from 40-49 years, while the remaining 50.0% were between 50 and 59 years. A greater proportion of the groups of respondents were in their economically active years (20-49 years). Ideally, young officers will be able to put in more years of productive service if the conditions of service are good for them (Ekumankama, 1994).

Majority of the EAs (63.0%) BEAs (75.0%), and BESs (78.6%) have higher national diploma (HND) certificate and/or above respectively. All the ZEOs (100.0%) have HND certificate.

Most of the EAs (75.8%), BEAs (66.7%), and BESs (64.3%) had between 1 and 5 members in their respective households. Fifty percent of the ZEOs had between 6 and 10 members in their households, while the remaining 50.0% had between 11 and 15 household members.

The EAs acquired extension experience that ranged from 1 to 20 years with 61.3% of them having 1 to 5 years of service. Majority of the BEAs (91.7%) had between 1 and 5 years experience in extension work. The BESs acquired extension experience that ranged from 6 to 25 years with 28.6%, 28.4% and 35.7%, of them having 6 to 10 years, 11 to 15 years, and 16 to 20 years of service, respectively. Fifty percent of the ZEOs had between 21 and 25 years experience in extension work, while another 50.0% had acquired between 31 and 35 years experience in extension work. The survey shows that the ZEOs were generally more experienced in extension work than the EAs, BEAs and BESs. This result could be explained by the fact that the ZEOs are senior officers who reached that level by promotion from EA to BES to ZEO. Therefore, it naturally follows that higher officers have put in more years in most cases.

Organizational Confidence of Extension Agents in Akwa Ibom State ADP

Entries in Table 1 indicate the means of the organizational confidence indices for the EAs in Akwa Ibom state ADP. The table reveals that the EAs were mostly satisfied with the level of interaction between them and their supervisors ($X=4.26$). This was followed by methods of human relationships ($X=3.42$), patterns of role clarification ($X=3.11$), and lines of organizational communication ($X=3.10$). Effective interaction between workers and their supervisors and cordial relationships among employees are essential factors in a work environment. This is because they will increase the

probability that workers will be satisfied with their roles, have more confidence in the organization, and perform more effectively.

The grand mean organizational confidence was 35.09, while the organizational confidence level was 3.00 implying that majority of the EAs were sometimes satisfied with the Akwa Ibom state ADP as an organization.

Table 1: Confidence of the Extension Agents in Akwa Ibom State ADP (N=62).

<u>Organizational Confidence Indices</u>	<u>X satisfaction score</u>
The level of interaction between you and your supervisor	4.26
Timeliness of salary payment	2.27
Provision of incentives	1.29
Promotion and appraisal exercise	1.65
Concern for the staff social welfare	1.71
Provision of basic logistics including working kit	1.60
Coordination and supervision techniques being used	2.58
Monitoring and evaluation system	2.84
Interpretation of collective bargaining contract or personnel policy	2.11
Channels for adjustment or redressal of grievances	2.18
Lines of organizational communication	3.10
Methods of human relationships	3.42
Performance feedback	2.97
Patterns of role clarification	3.11
Grand mean \bar{X} organizational confidence score	= 35.09
Organizational Confidence Level	= 2.51 \approx 3.00

Organizational Confidence of Block Extension Agents in Akwa Ibom State ADP

Table 2 indicates the means of the organizational confidence indices for the BEAs in Akwa Ibom state ADP. The BEAs were mostly satisfied with the level of interaction between them and their immediate supervisors ($X = 4.50$). Next to this was performance feedback ($X = 3.58$), followed by patterns of role clarification ($X = 3.50$). This was followed by methods of human relationships ($X = 3.42$). The nature of relationships with one's supervisor and colleagues affect the level of confidence a worker has on his organization. Proper clarification of an employee's role is necessary if role conflict is to be avoided. According to Mmaduakonam (1997), role conflict exists when a worker in a particular work role is torn by conflicting job demands or is doing things he really does not want to do or does not think are part of the job specification. Role conflict will obviously lower the job satisfaction of an employee and ultimately the level of confidence he has in his organization.

The grand mean organizational confidence was 37.16, while the organizational confidence level was $2.65 \approx 3.00$. These findings imply that most of the BEAs were sometimes satisfied with the Akwa Ibom state ADP as an organization.

Table 2: Confidence of the Block Extension Agents in Akwa Ibom State ADP (N=12)

Organizational Confidence Indices	X Satisfaction Score
The level of interaction between you and your Supervisor	4.50
Timeliness of salary payment	2.67
Provision of incentives	1.83
Promotion and appraisal exercise	1.33
Concern for the staff social welfare	1.92
Provision of basic logistics including working kit	1.67
Coordination and supervision techniques being used	2.67
Monitoring and evaluation system	2.83
Interpretation of collective bargaining contract or personnel policy	2.08
Channels for adjustment or redressal of grievances	2.58
Lines of organizaional communication	2.58
Methods of human relationships	3.42
Performance feedback	3.58
Patterns of role clarification	3.50
Grand mean (X) Organizational confidence score	= 37.16
Organizational confidence level	= 2.65 ~ 3.00

Organizational Confidence of Block Extension Supervisors in Akwa Ibom State ADP

Entries in Table 3 indicate the means of the organizational confidence indices for the BESs in Akwa Ibom state ADP. The BESs were mostly satisfied with the level of interaction between them and their supervisors ($X=3.86$). Next to this were lines of organizational communication ($X=3.29$). This was followed by monitoring and evaluation system ($X=3.21$), methods of human relationships ($X=3.21$), performance feedback ($X=3.21$), and patterns of role clarification ($X=3.07$).

These findings are contrary to an earlier finding that alienation between the management and the workers, lack of interpersonal relationships and quarrels are characteristics of most organizations and industrial setup in Nigeria (Maduakonam, 1997)

Good interpersonals between a worker and his supervisor and counterparts are central factor in individual and organizational health (Mmaduakonam, 1997). Good communication with management, colleagues and subordinates makes an organization to maintain goodwill, grows and waxes (Nwachukwu, 1988). The grand mean organizational confidence was 37.43, while the organizational confidence level was 3.00, implying that majority of the BESs were sometimes satisfied with the Akwa Ibom state ADP as an organization.

Table 3: Confidence of the Block Extension Supervisors in Akwa Ibom state ADP (N=14)

Organizational Confidence Indices Score	X Satisfaction
The level of interaction between you and your supervisor	3.86
Timeliness of salary payment	2.43
Provision of incentives	1.36
Promotion and appraisal exercise	1.93
Concern for the staff social welfare	2.36
Provision of basic logistics including working kit	1.71
Coordination and supervision techniques being used	2.93
Monitoring and evaluation system	3.21
Interpretation of collective bargaining contract or personnel policy	2.57
Channels for adjustment or redressal of grievances	2.29
Lines of organizational communication	3.29
Methods of human relationships	3.21
Performance feedback	3.21
Patterns of role clarification	3.07
Grand mean (X) Organizational Confidence Score	= 37.43
Organizational Confidence Level	= 2.67 ≈ 3.00

Organizational Confidence of Zonal Extension Officers in Akwa Ibom state ADP

The means of the organizational confidence indices for the ZEOs in Akwa Ibom state ADP are presented in Table 4. The ZEOs were mostly satisfied with the level of interaction between them and their supervisor ($X=4.00$), lines of organizational communication ($X=4.00$) and methods of human relationships ($X=4.00$). The table also reveals that the mean satisfaction scores for monitoring and evaluation system, performance feedback, patterns of role clarification, timeliness of salary payment, coordination and supervision techniques being used, and interpretation of collective bargaining contract or personnel policy were 3.50, 3.50, 3.50, 3.00, and 3.00 respectively. A worker's behaviour is influenced by interactions with people around him. Good interpersonal relationships at work can enhance the organizational confidence of workers. A good organizational climate is set when the leader sets the pace for open communication by encouraging subordinates to be frank, by soliciting information and sending out feedback (Nwachukwu, 1988).

The grand mean organizational confidence was 43.50, while the level of organizational confidence was 3.00. These findings imply that the ZEOs were sometimes satisfied with the Akwa Ibom state ADP as an organization.

Table 4: Confidence of the Zonal Extension Officers in Akwa Ibom state ADP

Organizational Confidence Indices	X Satisfaction Score
The level of interaction between you and your supervisor	4.00
Timeliness of salary payment	3.00
Provision of incentives	2.50
Promotion and appraisal exercise	2.50
Concern for the staff social welfare	2.50
Provision of basic logistics including working kit	2.50
Coordination and supervision technique being used	3.00
Monitoring and evaluation system	3.50
Interpretation of collective bargaining contract or personnel policy	3.00
Channels for adjustment or redressal of grievance	2.50
Lines of organizational communication	4.00
Methods of human relationships	4.00
Performance feedback	3.50
Patterns of role clarification	3.50
<hr/>	
Grand mean (\bar{X}) organizational confidence score	= 43.50
Organizational confidence level	3.11 \approx 3.00

Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Extension Staff.

Four personal characteristics, namely age, level of formal education, household size and years of extension experience were selected and their relationships with the organizational confidence variables of the extension staff were determined using Pearson correlation. Four hypotheses stated in the null form were tested and the results shown in Tables 5 to 8.

Relationship between Selected Personal Characteristics and Organizational Confidence Variables of Extension Agents in Akwa Ibom State ADP

The first hypothesis states that there is no significant relationship between selected personal characteristics and organizational confidence variables of extension agents in Akwa Ibom state ADP. Data in Table 5 reveal that level of formal education of EAs was negatively and significantly correlated with timeliness of salary payment ($r = -0.31$), methods of human relationships ($r = -0.025$) and patterns of role clarification ($r = -0.26$). The implication of this finding is that the higher the level of formal education received by the EAs, the less satisfied they were with timeliness of salary payment, methods of human relationships and patterns of role clarification and thus, the less they developed confidence in the organization.

The table further shows that household size of EAs was positively and significantly correlated with timeliness of salary payment ($r = 0.26$), implying that the larger the household size of the EAs, the more satisfied they were with the time they received their salaries and hence, the more they developed confidence in the organization. Extension experience of EAs was positively and significantly correlated with performance feedback ($r = 0.33$), meaning that the more extension experience the EAs acquired, the more satisfied they were with performance feedback and thus, the more they developed confidence in the organization. Age expressed a non-significant relationship with all the organizational confidence variables, implying that age was not significantly associated with organizational confidence of EAs in Akwa Ibom state ADP.

Table 5: Pearson Correlation Analysis of the Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Extension Agents in Akwa Ibom State ADP (N=62)

Personal Characteristics	Organizational Confidence Variables													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	-0.09	0.14	-0.02	0.10	-0.03	-0.05	0.01	0.18	0.02	-0.08	0.21	0.22	0.12	0.09
Level of formal education	-0.03	-0.31*	-0.13	-0.05	0.07	-0.05	0.09	-0.24	-0.02	0.04	-0.12	-0.25*	-0.06	-0.26*
Household size	0.21	0.26*	0.08	0.01	-0.23	-0.10	0.18	0.17	-0.02	0.06	0.21	0.00	0.03	0.01
Extension experience	-0.12	-0.06	0.13	0.09	0.01	0.10	0.11	0.14	0.17	0.13	0.11	0.11	0.35*	0.07

*Significant at $P < 0.05$

Key:

- 1 = The level of interaction between you and your supervisor
- 2 = Timeliness of salary payment
- 3 = Provision of incentives
- 4 = Promotion and appraisal exercise
- 5 = Concern for the staff social welfare
- 6 = Provision of basic logistics including working kit
- 7 = Coordination and supervision techniques being used
- 8 = Monitoring and evaluation system
- 9 = Interpretation of collective bargaining contract or personnel policy
- 10 = Channels for adjustment or redressal of grievances
- 11 = Lines of organizational communication
- 12 = Methods of human relationships
- 13 = Performance feedback
- 14 = Patterns of role clarification

Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Block Extension Agents in Akwa Ibom State ADP

The second hypothesis states that there is no significant relationship between selected personal characteristics and organizational confidence variables of block extension agents in Akwa Ibom state ADP. Data in Table 6 indicate that age was negatively and significantly correlated with the level of interaction between BEA and her supervisor ($r = -0.75$), promotion and appraisal exercise ($r = -0.28$), concern for the staff social welfare ($r = -0.31$), provision of basic logistics including working kit ($r = -0.46$), coordination and supervision techniques being used ($r = -0.25$) and lines of organizational communication ($r = -0.33$). This finding implies that the older the BEAs, the less satisfied they were with the level of interaction between them and their supervisor and the other aforementioned organizational confidence variables and hence, the less they developed confidence in the organization. Age was positively and significantly correlated with timeliness of salary payment ($r = 0.90$), performance feedback ($r = 0.39$) and patterns of role clarification ($r = 0.42$). This implication of this finding is that the older the BEAs, the more satisfied they were with these organizational confidence variables, thus the more they developed confidence in the organization.

The table further shows that level of formal education was negatively and significantly correlated with the level of interaction between BEA and her supervisor ($r = -0.30$), provision of incentives ($r = -0.29$), concern for the staff social welfare ($r = -0.42$), provision of basic logistics including working kit ($r = -0.69$), interpretation of collective bargaining contract or personnel policy ($r = -0.36$), methods of human relationships ($r = -$

0.27), and patterns of role clarification ($r=-0.30$). This means that the higher the level of formal education received by the BEAs, the less satisfied they were with these organizational confidence variables and therefore, the less confidence they developed in the organization. The level of formal education was positively and significantly correlated with monitoring and evaluation system ($r=0.25$) and channels for adjustment or redressal of grievances ($r=0.25$). This finding imply that the higher the level of formal education received by the BEAs, the more satisfied they were with these organizational confidence variables and hence, the more they developed confidence in the organization

The size of the household was positively and significantly correlated with the level of interaction between BEA and her supervisor ($r=0.26$), timeliness of salary payment ($r=0.55$), promotion and appraisal exercise ($r=0.33$), coordination and supervision techniques being used ($r=0.45$), monitoring and evaluation system ($r=0.77$), channels for adjustment or redressal of grievances ($r=0.32$) and lines of organizational communication ($r=0.32$), respectively. This finding implies that the larger the household size of the BEAs, the more satisfied they were with the aforementioned organizational confidence variables. This, in turn, ensured development of more confidence by the BEAs in their organization. Household size was negatively and significantly correlated with provision of basic logistics including working kit ($r=-0.43$) and interpretation of collective bargaining contract or personnel policy ($r=-0.40$), implying that the larger the household size of the BEAs, the less satisfied they were with provision of basic logistics including working kit and interpretation of collective bargaining contract or personnel policy and hence, the less they developed confidence in the organization.

Table 6 also reveals that extension experience was negatively and significantly correlated with promotion and appraisal exercise ($r= -0.31$), concern for the staff social welfare ($r= -0.50$), and provision of basic logistics including working kit ($r= -0.41$) respectively. The implication of this finding is that the more experience the BEAs acquired on extension work, the less satisfied they were with these organizational confidence variables; thus, the less they developed confidence in the organization. The extension experience of the BEAs was positively and significantly correlated with timeliness of salary payment ($r= 0.26$) and monitoring and evaluation system ($r=0.27$), implying that the more experience the BEAs acquired on extension work, the more satisfied they were with the time they received their salaries and monitoring and evaluation system, thus the more they developed confidence in the organization.

Table 6: Pearson Correlation Analysis of the Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Block Extension Agents in Akwa Ibom State ADP (N=12)

Personal Characteristics	Organizational Confidence Variables													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	-0.75*	0.90*	-0.20	-0.28*	-0.31*	-0.46*	-0.25*	0.05	-0.04	-0.14	0.33*	-0.10	0.39*	0.42*
Level of formal education	-0.30*	-0.09	-0.29*	-0.05	-0.42*	-0.69*	0.12	0.25*	0.36*	0.25*	0.12	-0.27*	-0.20	-0.30*
Household size	0.26*	0.55*	0.22	0.33	-0.06	-0.43*	0.45*	0.77*	-0.40*	0.32*	0.32*	0.18	0.21	0.09
Extension Experience	-0.15	0.26*	0.00	-0.31*	-0.50*	-0.41*	0.17	0.27*	0.23	0.05	0.18	-0.15	-0.23	-0.15

*Significant at $P < 0.05$

KEY:

- 1 = The level of interaction between you and your supervisor
- 2 = Timeliness of salary payment
- 3 = Provision of incentives
- 4 = Promotion and appraisal exercise
- 5 = Concern for the staff social welfare
- 6 = Provision of basic logistics including working kit
- 7 = Coordination and supervision techniques being used
- 8 = Monitoring and evaluation system
- 9 = Interpretation of collective bargaining contract or personnel policy
- 10 = Channels for adjustment or redressal of grievances
- 11 = Lines of organizational communication
- 12 = Methods of human relationships
- 13 = Performance feedback
- 14 = Patterns of role clarification

Relationship Between Selected Personal Characteristics and Organizational Confidence variables of Block Extension Supervisors in Akwa Ibom State ADP

The third hypothesis states that there is no significant relationship between selected personal characteristics and organizational confidence variables of block extension supervisors in Akwa Ibom state ADP. According to Table 7, age was positively and significantly correlated with the level of interaction between BES and the supervisor ($r=0.36$), provision of incentives ($r=0.31$), promotion and appraisal exercise ($r=0.29$), coordination and supervision techniques being used ($r=0.37$), interpretation of collective bargaining contract or personnel policy ($r=0.30$), channel for adjustment or redressal of grievances ($r=0.38$) and lines of organizational communication ($r=0.53$). This finding implies that the older the BESs, the more satisfied they were with the aforementioned organizational confidence variables, thus, the more they developed confidence in the organization.

Data in Table 7 reveal that level of formal education was negatively and significantly correlated with the level of interaction between BES and the supervisor ($r=-0.66$), provision of incentives ($r=-0.25$), coordination and supervision techniques being used ($r=-0.43$), interpretation of collective bargaining contract or personnel policy ($r=-0.26$), channel for adjustment or redressal of grievances ($r=-0.55$), lines of organizational communication ($r=-0.62$), methods of human relationship ($r=-0.56$), performance feedback ($r=-0.36$) and patterns of role clarification ($r=-0.37$), respectively. The implication of this finding is that the higher the level of formal education received by the BESs, the less satisfied they were with the aforementioned organizational confidence variables, thus, the less confidence they developed in their organization. Level of formal education was positively and significantly correlated with concern for the staff social welfare ($r=0.37$), implying that the higher the level of formal education received by the BESs, the more satisfied they were with concern for the staff social welfare and hence, the more confidence they developed in their organization.

Table 7 indicates that household size was positively and significantly correlated with the level of interaction between BES and the supervisor ($r=0.54$), coordination and supervision techniques being used ($r=0.44$), channels for adjustment or redressal of grievances ($r=0.68$), lines of organizational communication ($r=0.90$), methods of human relationships ($r=0.54$) and patterns of role clarification ($r=0.54$), respectively. The implication of this finding is that the larger the household size of the BESs, the more satisfied they were with the aforementioned organizational confidence variables and hence, the more they developed confidence in the organization. Household size was negatively and significantly correlated with concern for the staff social welfare, implying that the larger the household size of the BESs, the less satisfied they were with concern for the staff social welfare, thus, the less they developed confidence in the organization.

Table 7 shows that extension experience was positively and significantly correlated with provision of basic logistics including working kit ($r=0.45$), coordination and supervision techniques being used ($r=0.30$), channel for adjustment or redressal of grievances ($r=0.32$), lines of organizational communication ($r=0.32$) and patterns of role clarification ($r=0.28$), respectively. This finding implies that the more experience the BESs acquired on extension work, the more satisfied they were with these organizational confidence variables, thus, the more they developed confidence in the organization. Extension experience was negatively and significantly correlated with monitoring and evaluation system, meaning that the more experience the BESs acquired on extension work, the less satisfied they were with monitoring and evaluation system and hence, the less they developed confidence in the organization.

Table 7: Pearson Correlation Analysis of the The Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Block Extension Supervisors in Akwa Ibom State ADP (N=14)

Personal Characteristics	Organizational Confidence Variables													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	0.36*	0.19	0.31*	0.29*	0.11	0.14	0.37*	0.08	0.30*	0.38*	0.53*	0.22	0.02	0.11
Level of formal Education	-0.66*	-0.01	-0.25*	-0.22	0.37*	0.11	-0.43*	-0.11	-0.26*	-0.55*	-0.62*	-0.56*	-0.36*	-0.37*
Household size	0.54*	0.20	0.11	0.10	-0.35	0.06	0.44*	-0.07	-0.02	0.68*	0.90*	0.54*	0.22	0.54*
Extension Experience	0.12	0.12	0.18	0.08	0.19	0.45*	0.30*	-0.26*	-0.11	0.32*	0.32*	0.12	0.09	0.28*

*Significant at $P < 0.05$

KEY:

- 1= The level of interaction between you and your supervisor
- 2= Timeless of salary payment
- 3= Provision of incentives
- 4= Promotion and appraisal exercise
- 5= Concern for the staff social welfare
- 6= Provision of basic logistics including working kit
- 7= Coordination and supervision techniques being used
- 8= Monitoring and evaluation system
- 9= Interpretation of collection bargaining contract or personnel policy
- 10= Channel for adjustment or redressal of grievances
- 11= Lines of organizational communication
- 12= Methods of human relationships
- 13= Performance feedback
- 14= Patterns of role clarification

Relationship Between Selected Personal Characteristics And Organizational Confidence Variables of Zonal Extension Officers In Akwa Ibom State ADP

The fourth hypothesis states that there is no significant relationship between selected personal characteristics and organizational confidence variables of zonal extension officers in Akwa Ibom state ADP. Data on the relationship between selected personal characteristics and organizational confidence variables of zonal extension officers in Akwa Ibom state ADP are presented in Table 8. Age was found positively and significantly correlated with the provision of incentives ($r=1.00$) and performance feedback ($r=1.00$) implying that the older the ZEOs, the more satisfied they were with provision of incentives and performance feedback, thus, the more they developed confidence in the organization. Age was also negatively and significantly correlated with concern for the staff social welfare ($r=-1.00$), provision of basic logistics including working kit ($r= -1.00$), monitoring and evaluation system ($r=-1.00$), channels for adjustment or redressal of grievances ($r=-1.00$) and patterns of role clarification ($r=-1.00$), respectively. This means that the older the ZEOs, the less satisfied they were with these organizational confidence variables and hence, the less they developed confidence in the organization.

The table indicates that household size was negatively and significantly correlated with provision of incentives ($r=-1.00$), and performance feedback ($r=-1.00$). This finding implies that the larger the household size of the ZEOs, the less satisfied they were with provision of incentives and performance feedback and thus, the less they developed confidence in the organization. Household size was also positively and significantly correlated with concern for the staff social welfare ($r=1.00$), provision of basic logistics including working kit ($r=1.00$), monitoring and evaluation system ($r=1.00$), channels for adjustment or redressal of grievance ($r=1.00$), and patterns of role clarification ($r=1.00$), respectively.

The implication of this finding is that the larger the household size of the ZEOs, the more satisfied they were with these organizational confidence variables and hence, the more they developed confidence in the organization.

Table 8 shows that extension experience of the ZEOs was positively and significantly correlated with provision of incentives ($r=1.00$), and performance feedback ($r=1.00$). This finding implies that the more experience the ZEOs acquired in extension work, the more satisfied they were with provision of incentives and performance feedback and thus, the more they developed confidence in the organization. Also, extension experience was negatively and significantly correlated with concern for the staff social welfare ($r=-1.00$), provision of basic logistics including working kit ($r=-1.00$), monitoring and evaluation system ($r=-1.00$), channels for adjustment or redressal of grievances ($r=-1.00$), and patterns of role clarification ($r=-1.00$), respectively. This means that the more experience the ZEOs acquired on extension work, the less satisfied they were with these organizational confidence variables and hence, the less they developed confidence in the organization.

The hypothesis of no significant relationship between selected personal characteristics and organizational confidence variables of ZEOs in Akwa Ibom state ADP was rejected on the basis of the above findings.

Table 8: Pearson Correlation Analysis of the Relationship Between Selected Personal Characteristics and Organizational Confidence Variables of Zonal Extension Officers in Akwa Ibom State ADP (N=2).

Personal Characteristics	Organizational Confidence Variables													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	A	a	1.00*	a	-1.00*	1.00*	a	1.00*	a	-1.00*	A	a	1.00*	-1.00*
Level of formal education	A	a	A	a	A	A	a	a	a	a	A	a	a	a
Household Size	A	a	-1.00*	a	1.00*	1.00*	a	1.00*	a	1.00*	A	a	-1.00*	1.00*
Extension experience	A	a	1.00*	a	-1.00*	-1.00*	a	-1.00*	a	-1.00*	A	a	1.00*	1.00*

*Significant at $P < 0.05$

^a cannot be computed because one of the variables is constant

key:

- 1= The level of interaction between you and your supervisor
- 2 = Timeliness of salary payment
- 3= Provision of incentives
- 4= Promotion and appraisal exercise
- 5= Concern for the staff social welfare
- 6= Provision of basic logistics including working kit
- 7= Coordination and supervision techniques being used
- 8= Monitoring and evaluation system
- 9= Interpretation of collective bargaining contract or personnel policy
- 10= Channels for adjustment or redressal of grievances
- 11= Lines of organizational communication
- 12= Methods of human relationships
- 13= Performance feedback
- 14= Patterns of role clarification

Conclusion

This study has shown that majority of the EAs, BEAs, BESs, and ZEOs in Akwa Ibom state ADP were sometimes satisfied with ADP as their organization. Level of formal education, household size, and extension experience of EAs were significantly associated with organizational confidence. Age, level of formal education, household size and extension experience of BEAs were strong predictors of organizational confidence. Age, level of formal education, household size and extension experience of BESs were significantly associated with organizational confidence. Age, household size and extension experience of ZEOs were strong indicators of organizational confidence.

Policies should be designed toward ensuring good and balanced working conditions in AKADEP. This will promote the organizational confidence of the extension personnel and ultimately improving their job performance.

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Effect of Group Participation on Access to Micro-Credit among Rural Women in Osun and Oyo States, Nigeria.

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Abstract

Various reports have it that poverty is more prevalent among people in rural communities with women being the most vulnerable group. Globally, improved access to micro credit is promoted as an important strategy in the struggle against poverty in developing economies. Using a sample of 104 rural women selected through multi-stage sampling technique, this study examined group participation and access to micro credit among women in rural communities of Osun and Oyo States, Nigeria. The results showed that about 85.6% of rural women belonged to micro credit groups notably religious and traders associations through which 42.3% were able to source credit. Rural women were only able to meet 40.3% of the capital need through micro-credit offered by the groups. Cooperative societies granted higher volume of credit than the local groups while women farmers had access to greater volume of credit than women traders; however, micro credit was yet to have significant impact on poverty status of the women.

Keywords: micro-credit, rural women, poverty

Introduction

Over the past two decades there has been increased recognition of micro credit as one of the leading strategies in poverty eradication among nations of the world. In effect, the World Summit for Social Development, held in Copenhagen in March 1995, underlined the importance of improving access to credit for small rural or urban producers, landless farmers and other people with low or no income, with special attention to the needs of women and disadvantaged and vulnerable groups (UNO 1998).

Records have also revealed that more than one billion people across the world today live in poverty with Nigeria harbouring over 60 million of this number (6% percent of the total figure) (Nwachukwu, 2006). As the most populous and one of the largest countries in sub-Saharan Africa, the issue of poverty in Nigeria is of concern not only in itself but also as a challenge for poverty reduction mandate in the entire African continent. Though, Nigeria is blessed with abundant physical and human resources, there had been progressively worsening welfare and poverty condition of its nationals (Okunmadewa, 2001).

However, research reports and official documents show that poor people in Nigeria tend to be concentrated in communities that lack the benefits of modern development. Rural areas and urban fringes have a slightly higher concentration of poor people (Ayanwale and Alimi 2004).

Generally, available estimates (CIA 2008, DFID 2008) have shown that about 70% of the population lives below poverty line while poverty reduction in the country has been rated to be very slow with decreasing potential for meeting the Millennium Development Goal (MDG) 2015 target. In addition, Nwachukwu et al (2007) asserted that evidence from previous surveys conducted by the Federal Office of Statistics showed that poverty in Nigeria is overwhelmingly a rural problem. Various reports (Ajetomobi 1995, World Bank 1999 quoted in Ayanwale and Alimi 2004, Ajao 2000, Ajani 2008, Kareem et al 2008) also have it that people in rural communities and

especially women are the most vulnerable group in Nigeria owing to their limited access to productive resources, coping strategies, safety nets and constantly growing sense of insecurity.

This possibly explains the focusing of poverty alleviation programmes on rural communities by various administrations in Nigeria over the years as noted by Ogwumike (2002).

In recognition of micro credit as an important tool in the struggle against poverty, CBN (1999) reported the significance of credit and other inputs to agricultural output and submitted that the provision and use of these inputs in the right proportion were crucial to increasing agricultural output and productivity in Nigeria. Availability and proper usage of inputs/credit has also been empirically proved to enhance productivity level of farm households in Nigeria (Okoruwa and Oni, 2002). However, since it has also been established that women are usually at the receiving ends in accessing production incentives and it has even been suggested that such limitations could be removed through group participation. It then becomes pertinent to investigate the extent to which group participation has been able to enhance access to credit among women in rural communities in Osun and Oyo States, Nigeria.

Methodology

Data for this study were generated from a household survey of 120 women selected through a multi-stage sampling technique. The first stage involved purposive selection of two ADP zones that are predominantly rural in geographical distribution, followed by selection of ten villages from each of the zones. Rural households were randomly selected from the list of households members obtained from member of each of the villages who served as contact for the study.

However, a total of 104 questionnaires certified as containing adequate information relevant to the scope of the study were used in the analysis. Data generated were analyzed using descriptive statistics including frequency distribution, percentages, and means while chi-square statistic was used to draw inference about the dependence of group participation on poverty status of rural women. The study adopted two-third of mean household expenditure (Oke *et al* 2007) as the poverty line.

Results and Discussion.

Socio-economic Characteristics and Membership of micro-credit groups

The distribution of the respondents on the basis of their socio-economic characteristics and the relationship between these and membership of micro-credit group among rural women is shown on Table 1. The distribution of the women by their age group indicates that majority of the women were within the productive age of 20 to 60 years and belong to micro credit associations (85.6%). There was no significant difference in the average age of women who were members of micro credit groups (44.1) and non members (42.8). The results also indicated that majority of the rural women (62.5%) had formal education from primary schools (20.2%); secondary school (26.0%) and post secondary schools (16.3%) while a greater percentage (48%) were members of micro credit associations. The study has shown that majority of the women in micro credit group were within the productive age in addition to having formal education. This is in consonance with earlier findings (Ayanwale and Alimi 2004, Oke *et al*, 2007) that members of micro-credit groups were mostly within the productive age and had formal education

Meanwhile, trading in farm produce (82.7%) was the commonest vocation among the respondents with about 68% of the women traders belonging to micro-credit. This agrees with an earlier study (Oke *et al* 2007) that more female members of micro-credit

groups were involved in non-farming businesses than farming businesses. In addition, about 52% had alternative sources of income alongside their primary vocation and were predominantly members of micro-credit groups (44.2%). The distribution of the population by religious sect is indicative of the importance of Islam (57.7%) and Christianity (42.3%) among women in rural communities of the study area. However, a greater percentage of women under the two religions were members of micro-credit associations.

Further analysis of the distribution also suggested that age group, level of education; religion and type of family had significant relationship with membership of micro-credit associations among rural women. The dominance of the population by women within the productive age and the prevalence of literate majority are reflective of availability of physical and mental strength, and innovativeness for entrepreneurial initiatives among the rural women. The combined influence of these is thus capable of stimulating increased drive for investible fund and consequently, participation in micro credit groups. In addition, an educated population is known to provide the ingredient for adequate exposure to the basic skills required in organizing, coordinating and managing not only the acquired fund but also the home grown informal sources of such fund. The relevance of these had been demonstrated in earlier studies (Ayanwale and Alimi 2004) of micro credit groups with emphasis on the importance of age and level of education on managing of micro credit group and credit sourcing.

The impact of religion on credit according to Kessey (2005), takes root in moral basis regarding the prohibition of interest (*riba*) by Muslims and this could, to some extent constitute a limiting factor on sourcing of credit from formal institutions by this group. However, emerging trends in the roles played by religious groups and associations in the struggle against poverty through economic empowerment at the grassroots is a testimony to the potential influence that religion can play in membership and functioning of micro-credit groups.

Similarly, the influence of family type (monogamous or polygamous) and its attendant influence on family size and pressure on family resources are capable of stimulating the drive from extra-household means of meeting competing ends. Consequent upon this, the drive for additional support outside personal earnings might be more pronounced within one family type and the other especially as this study has shown that members of micro-credit group have smaller family size and number of children in the household than non members. Perhaps, smaller family size affords opportunity for savings, which is a significant feature of membership of micro-credit groups.

Table 1: Influence of socio-economic characteristics of Respondents on Group Participation among rural women.

Characteristics	Member	Non Member	Test Statistic Value
<u>Age Group (Years)</u>			
21-40	26(25.0)	10(9.6)	7.956 ^{C*}
41-60	63(60.6)	05(4.8)	
Average Age (years)	44.1	42.8	0.605 [†]
<u>Level of Education</u>			
None	39 (37.5)	0(0.0)	49.988 ^{C *}
Primary School	21 (20.2)	0(0.0)	
Secondary School	12(11.5)	15(14.4)	
Post Secondary	17(16.3)	0(0.0)	
<u>Occupation</u>			
Farming	05(4.8)	0(0.0)	3.669 ^C
Trading in farm produce	71(68.3)	15(4.4)	
Trading in non-farm products	5(4.8)	0(0.0)	
Civil Servant	5(4.8)	0(0.0)	

Agro-Processor	03(2.9)	0(0.0)	
<u>Alternative Income Source</u>			
Yes	46(44.2)	8(7.7)	0.014 ^C
No	43(41.3)	7(6.7)	
<u>Religion</u>			
Islam	60(57.7)	0 (0.0)	23.902 ^{C*}
Christianity	29(41.3)	15(4.4)	
<u>Type of Family</u>			
Monogamous	47(45.2)	0(0.0)	14.453 ^{C*}
Polygamous	42(40.4)	15(4.4)	
Household size (Mean)	7.4	9.7	3.667 ^{t*}
Number of Children (mean)	3.8	4.3	1.890 ^{t*}

Source: Survey data 2007

* Significant (P≤0.05). t= T value C= Chi Square Value

Type of Associations and Sources of Micro Credit

Table 2 shows the distribution of rural women by the type of credit associations joined and the major sources of micro-credit. The results showed that religious association and traders associations were the prominent form of micro-credit groups joined by 70.2% and 48.1% of the respondents respectively. However, credits were commonly sourced from local micro-credit groups and cooperative societies thereby underscoring the importance of local associations in financing micro-credit needs of rural women. In the same vein, the results had as envisaged earlier pinpointed the increasing importance of religious organizations in providing ground for women economic empowerment as about 70% of the respondents belonged to these associations.

Table 2: Type of Associations and Sources of Credit

Type of Association ^a	Frequency	Percentage
Cooperative Societies	05	4.8
Traders Association	50	48.1
Religious Association	73	70.2
Farmers Association	02	1.9
<u>Sources of Credit</u>		
Cooperative societies	02	1.9
Money lenders	0	
Community Banks	0	0
Commercial Banks	0	0
Government Credit Agencies	0	0
Local Micro-credit groups	28	26.9
Friends and Relatives	0	0
Cooperatives and Local micro-credit groups	11	10.6

Source: Survey data 2007

^a Multiplicity of membership of associations

The study has shown that majority of the women belong to various form of micro-credit groups thereby underscoring the contribution of previous economic empowerment policies and programmes targeted at group participation for enhanced access to credit among rural women. However, the dominance of non formal groups over others like cooperative societies undermines the impact that the policies were designed as regards sourcing credit from formal sources. This is evident in the marked dependence on local groups for credit that is not known to guarantee adequate supply in terms of volume of credit required to bring about meaningful impact on the livelihood and poverty status of

the rural women. Also, the dominance of religious group is an indication of the new role and potential impact that religious groups are likely to have on credit supply to rural women. This is indeed a pointer to the need for policies directed at economic empowerment of rural women to mainstream religious association into the strategies.

Demand for Credit among Rural Women

The average investment capital need of the rural women was estimated as ₦58,827.07 out of which ₦25,721 representing (43.7%) of the capital need was sought as credit from the micro-credit groups. However, the estimates showed that ₦23,707 or (40.3%) of the credit requested for was financed by the group. This study revealed the high level of dependence of rural women on the micro-credit groups for investment capital and undoubtedly an indication of the significant role that the groups play in micro-credit financing. In addition, Table 3 shows that the investment capital need of women farmers (₦60,000) and consequently, the amount sought (₦49,000) and obtained as micro-credit (₦35,000) were significantly higher than those of women traders respectively ($P \leq 0.05$). However, the amount obtained as credit by women farmers (₦35,000) was about 71% of the amount requested for compared to women traders who obtained about 99% (₦ 22,138) of their credit requisition as micro-credit.

Similarly, the results (Table 4) showed that the volume of credit requested and obtained from cooperative societies were significantly higher than those of local credit group. However, rural women rated local micro credit groups significantly higher ($P \leq 0.05$) in terms of period of loan delivery and affordability of interest rates charged more than those of cooperative societies (Table 5).

Table 3: Credit Demand and Use of Credit among Rural Women

	N	Minimum	Maximum	Mean	Std. Deviation
Amount Required	41	10000	70000	58,827.07	16,694.89
Amount sought as Credit	41	10000	60000	25,721.71	14,601.41
Total Obtain as Credit	41	9000	60000	23,707.31	13,092.44
Credit Demand by Purpose of Credit					
	N	Need for Loan	Mean	t-Value	
Amount Required	5	Farming	60,000.00	2.767*	
	36	Trading	49,583.33		
Amount sought as Credit	5	Farming	49,000.00	4.836*	
	36	Trading	22,361.11		
Total Obtain as Credit	5	Farming	35,000.00	2.149*	
	36	Trading	22,138.88		

Source: Survey data 2007

* Significant ($P \leq 0.05$).

Table 4: Comparism of Credit Demand from Different Sources

Credit	Source1	N	Mean	Std. Deviation	T-Value
Total sought	Cooperative	6	40833.33	20836.67	3.084*
	Local Credit Group	35	23000.00	11517.25	
Total granted	Cooperative	6	35000.00	20736.44	2.422*
	Local Credit Group	35	21771.42	10586.02	

Source: Survey data 2007

* Significant ($P \leq 0.05$).

Table 5: Relative Performance Score of Sources of Credit

Performance Parameter	Credit Sources	N	Mean	T-Value
Volume of Credit	Cooperative Society	23	2.92	2.491*
	Local Credit Group	40	2.65	
Period of Delivery	Cooperative Society	23	2.30	4.763*
	Local Credit Group	40	2.83	
Affordability of Interest Rate	Cooperative Society	23	1.00	2.782*
	Local Credit Group	40	2.48	

Source: Survey data 2007

* Significant ($P \leq 0.05$).

Membership of Micro-Credit Group and Poverty Status of Rural Women.

It has been established that rather than being an end itself, provision of micro-credit is a tool to an end of alleviating poverty especially among rural dwellers. Hence, the yardstick for measuring the effectiveness of micro-credit groups is not limited to assessing its potential in provision of credit to its members but also to investigate whether such function has been translated to improvement in poverty status of the members. While assessment of credit delivery and recovery potential relates principally to the operational efficiency of the groups, the possibility of provided credit translating to improvement of poverty status of members relates to the use efficiency of such credit which is in turn affected by factors including the both the loanee-specific and enterprise-specific attributes.

The average monthly expenditure of the respondents was estimated as N14,559.62 and this was used in determining the poverty status into which each of the respondents belong as done by Oke et al (2007). The results presented in Table 6 showed that majority of members (77.5%) and non members (66.7%) were poor while the Chi-square value suggested that there was no significant relationship between membership of micro-credit group and poverty status of rural women. Hence; membership of micro-credit group had no significant relationship with the poverty status of rural women in the study area. This could probably be attributed to the dominance of non-formal credit institutions and its attendant problem of been able to guarantee meager amount as loan to its members. The study has earlier shown the estimate of average volume of credit as ranging from about N21,000 to N35,000 per year from both local credit group and cooperative societies respectively.

Table 6: Distribution of rural women by membership of micro-credit group and Poverty Status

Poverty Status	Membership of Micro-credit Group				Chi Square Value	
	Member		Non Member		Value	Remark
	Freq	%	Freq	%		
Poor	69	77.5	10	66.7	0.829	NS
Non Poor	20	22.5	05	33.3		
Total	89	100.0	15	100.0		

Source: Survey data 2007

NS=Not Significant ($P \leq 0.05$)

In addition, the average monthly expenditure profile of rural women members and non members of micro credit group (Table 7) showed that food accounted for the greatest percentage of expensed incurred personally by women in the households. However,

there was no significant difference in the expenditure profile of rural women who were members of micro credit groups and non members thereby underscoring the earlier suggestion that participation in micro-credit group was yet to have any significant member in the poverty status of rural women.

Table 7: Comparism of Average Expenditure by Membership of Association

Expenditure	Membership of Micro-credit Group		T-statistics		
	Member	Non Member	Value	P Level	Remark
Food	12,280.90	10,226.67	1.17	0.24	NS
Cloth	876.40	493.33	1.86	0.07	NS
Household Utensils	260.67	220.00	.1.45	0.15	NS
Children's education	780.89	440.01	1.70	0.09	NS
Family Health	349.44	293.33	1.67	0.09	NS
Social Functions	430.34	360.00	1.36	0.17	NS
Total Expenditure	14,978.65	12,073.33	1.47	0.15	NS

Source: Survey data 2007

NS= Not Significant (P ≤0.05)

Constraints in Sourcing of credit from micro credit groups.

Table 8 showed the relative importance of constraints faced by rural women in sourcing micro-credit. The distribution shows that inability to get information on sources of credit, difficulty in coping with the required protocols, problem of finding suitable guarantor are the prominent constraints against sourcing finance from micro-credit institutions. It is however evident that the bulk of this constraints are more relevant to credit sourcing from formal micro-credit institutions rather than the non formal sectors.

Table 8: Constants in Sourcing of Micro-credit by Rural Women

Constraint	No of Respondents	Percentage
Lack of Information on Sources	104	100.0
Difficulty in Coping with Protocols	68	65.4
Issue of collateral	48	46.2
Finding Guarantor	65	62.5
High Interest Rate	29	27.9
Untimely Delivery	21	20.2
Distance to Credit Institutions	21	20.2

Source: Survey data 2007

Conclusion

The results obtained from this study have shown that non-formal micro credit institutions form the most prominent sources of micro-credit to rural women. Specifically, local micro credit groups including traders and religious associations represented the dominant sources of micro credit through which they were able to source about 80% of the capital need as credit. The study also showed that more credit was demanded for investment in farming than trading with cooperative societies granting higher volume of credit. However, the performance of local credit group was rated higher by the rural women in terms of promptness of credit delivery and affordability of rates charged. However, the study showed that membership of micro-credit did not have any significant relationship with the poverty status of the women.

The study however suggested that policy efforts directed at giving publicity to the operations of formal micro-finance institutions through training programmes and awareness campaign could go a long way in removing some of the bottlenecks already experienced by rural women and thus enhanced their patronage of formal institutions for improved credit delivery and standard of living. Similarly, better appreciation needs to be accorded the role that is now been played by religious association in mobilizing rural women for enhanced access to micro credit.

The religious associations are likely to have structures that are easily amenable to organized reforms that could help increased access to greater volume of credit from formal sources like government credit agencies, micro-finance banks and commercial banks.

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Emerging Policy issues in the Special Crop Productions Programme of Benue State.

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Abstract

This study was carried out to examine the characteristics of the Special Crop Production Programme of the Benue State Ministry of Agriculture, Makurdi and highlight the emerging policy issues. Primary data were collected through structured questionnaire from 120 respondents who were randomly selected. Analysis of data was carried out using percentages and mean scores. Results showed that, procurement and distribution of inputs (improved seeds, fertilizer and herbicides) were insufficient and untimely provided. The situation forced farmers to acquire most of their input from the open market at exorbitant prices. Farmers were not involved in the planning of the programme and the extension personnel attached to the programme were not sufficient for effective delivery of extension services to farmers. The recommendations are that policy should be put in place to ensure early procurement and distribution of inputs at affordable prices, organize farmers into farmers associations and co-operatives to help pool farm lands, input procurement, and access to the use of machinery and providing market outlets for disposing farmers' outputs. This way a veritable extension policy for crop production will be ensured in Nigeria.

Key words: Characteristics, Special crop production programme, Benue State.

Introduction

In a bid to ensure food security, the Nigerian Government recently initiated activities that would improve agricultural development. These include among others, the Special Programme for Food Security (SPFS) implemented by the State ministry of Agriculture (FGN and FAO, 2000). This programme aim at extending the application of innovative technical and institutional low cost approaches to food production; improving the productivity and sustainability of agricultural system with the ultimate objective of contributing to better livelihood of the poor people.

The SPFS aims at assisting farmers in achieving their potentials for increasing output and production and consequently their incomes on sustainable basis; Crops to be grown include cereal, legumes, tubers and tree crops. Under the programme, Benue State has the mandate of producing rice, maize, soybeans and beniseed, which are suited to the agro-ecological conditions prevalent in the state.

The Special Crop Production Programme of the Benue State MOA has been in operation since the year 2000. The general objective of the study was to identify the characteristics of the Special Crop Production Programme of the Benue State Ministry of Agriculture (MOA). Specifically, the study was designed to:

- describe the characteristics of farmers participating in the programme.
- ascertain the characteristics of personnel attached to the programme; and
- examine the characteristics of the programme.
- Based on the above identify the emerging policy issues for improving the delivery of the programme.

Methodology

This study was carried out in Benue State of Nigeria. It has a total land area of 34059 km² and a population of 4,219,244 people (NPC, 2006). The state is situated

between longitude 7°30E and 10°E latitude 6°30N and 8°30N. The state has 23 Local Government Areas with Makurdi town as the state capital. (BNARDA, 1994 and 1997)

The sample for the study was drawn from the three (3) agricultural zones of the state. For each zone, one local government was randomly selected, making up three local government areas for the study. Each town has 60 SCPP Farmers. Two (2) towns were randomly selected from each local government, making a total of six towns (6 towns). One village from each town was randomly selected giving a total of six (6) villages and from each village twelve (12) participating farmers were randomly selected giving a total of seventy-two (72) respondents. Twelve (12) extension staff from each zone were randomly selected giving a total of thirty-six (36) extension staff and twelve (12) management staff were purposively selected totaling forty-eight (48) staff, with grand total of one hundred and twenty (120) respondents. Objectives one to five were analyzed using percentage and mean score respectively.

Results and Discussion

Characteristics of Farmers Participating in the Programme *Participation in Planning*

Table 1 shows that most farmers (76.9%) participating in the programme were not involved in the planning of the programme. Those who accepted being involved (23.1%) were however involved at the sites of demonstration plots as committee members.

These results confirm what Agbamu, (2005) earlier stated that, management of agricultural extension programmes in developing countries deny farmers involvement in planning for the programme they will implement.

When respondents were asked how they acquire land, 8.3% indicated they acquire community land, 3.7% of the respondents use personal land and the majority (81.5%) use family land. These findings show that, most respondents use family land for cultivation. The use of family land may hinder large-scale production, since family land is distributed among male children in the family; hence large families may encounter problems of scarcity of land and may tend to migrate.

Table 1: Distribution of farmers by farming characteristics

Characteristics of farmers	Percentage
	(n = 108)
Involvement in planning of programme	23.1
None involvement	76.9
Land tenure/ownership:	
Community land	8.3
Personal land	3.7
Leased land	3.7
Family inheritance	81.5
Government land	2.8
Type of Labour:	
Manual Labour (family/Hired)	89.9
Mechanized Labour	10.1
Use of tractor services:	
Yes	12.9
No	87.1
Type of seeds used:	
Improved seeds	79.6
Local variety	20.4
Reasons for not using improved seeds:	
They are expensive	19.9
They are not easily available	31.1
They require more fertilizer which is expensive	43.0
I don't want to use improved seeds	7.0
Application of fertilizer:	
Use of fertilizer	94.4
None application of fertilizer	5.6
Reasons for not applying fertilizer:	
Fertilizer is not easily available	13.0
Fertilizer is very expensive	84.2
Subsidized fertilizer arrive too late	2.8
Use of herbicides:	
Farmers who use herbicide	41.5
Farmers not using herbicide	58.5
Reasons:	
Herbicide are too costly	75.6
Herbicide are not easily available	24.4

Source: Field data, September 2005.

Table 1 also indicates that 89.9% of farmers use family labour (manual). This finding confirms what Njoku, (2000) had earlier asserted that, smallholder farmers depend largely on family labour which is now diminishing as a result of migration, thus raising the cost of hired labour. Farmers using mechanized labour were 10.1%. When farmers were further asked of their capability of using tractor services, majority (87.1%) agreed that they cannot afford using tractor services because of the high cost. 12.9% agreed of being capable of using tractor services.

This confirms the findings of Idachaba, (1991) who affirmed that, the prices of mechanized services are out of reach for the average farmer. The situation makes it impossible for our smallholder farmers to embark on large-scale production. Since majority (89.9%) of farmers use family labour, it further explains while large scale production was difficult.

Table 1 also reveals that most (79.6%) respondents use improved seeds. while 20.4% used local varieties. Also majority (43.0%) who do not use improved seeds complained that they require more fertilizer, which is expensive.

The evidence from the findings show that most farmers use improved seeds, hence there is tendency for increased output. Most of the respondents (94.4%) apply fertilizer on their crops. This shows that, farmers are aware of the need to apply fertilizer to improved their soil.

When farmers were further asked if fertilizer was purchased at an affordable price, a majority (84.3%) indicated that, fertilizer was purchased at a high price. This situation confirm the views of Jaachin, (1991) and Amalu, (1998) that insufficient and late arrival of fertilizer often results in: fertilizer application that are well below the recommended rates and failing to realize the maximum yield potentials of new varieties that require adequate fertilizer for maximum yield.

Table 1 also shows that 41.5% of farmers apply herbicide on their crops, but majority (58.5%) does not apply herbicide. The finding indicates that many farmers did not use herbicide to control weed in their crops. In such situations, for crops to be intensified, FGN and FAO, (2000) opined that, it must be promoted by the introduction of high yielding and disease resistant crop varieties.

Characteristics of Personnel Attached to the Programme

Qualification of Extension Personnel

Table 2 reveals the qualification of extension personnel. The result shows that, 53.4% of the respondents had sub-university educational qualification (OND/NCE). While those with HND/BS.c/MS.c accounted for 43.8% and 2.8% had secondary school qualification.

Table 2: Distribution of Extension Personnel by Qualification.

Qualification	Percentage (n=36)
Secondary certificate course in agriculture	2.8
OND/NCE	53.4
HND/BSC/MSC	43.8

Source: Field data, September 2005.

The result shows that, most extension personnel have a sub-university qualification, which is not very suitable for extension service. Chuta, (1992), Eze, (1994) and Asiabaka (2002) noted that, the sub-university degree affects the effectiveness of extension service. This finding confirm the statement of Swanson, (1997) who stated that, lots of front-line extension workers in Africa are characterized by low qualifications such as secondary school and OND/HND certificates. Agbamu (2002) suggested that frontline extension agents should possess a university degree like most of their Japanese counterpart to enable them perform with utmost confidence.

Extension/farmer ratio

Table 3 indicates that majority (33.3%) of the 40 extension personnel attached to the programme worked with 500-1000 farmers. The mean/average extension farmer's ratio was 1:1597.2. This is high and not convenient for effective extension service delivery. This implies that only few farmers may be reached by the extension service,

this is because the more the extension hands the more the coverage of the area of intervention and effectiveness of extension (Agbamu 2005).

Table 3: Distribution of extension/farmers worked with n = 36.

Extension/Farmer Ratio	F	M	FM	%	X
Farmers worked with: 500-1000	12	750	900	33.3	
Farmers worked with: 1000-1500	6	1250	7500	16.7	
Farmers worked with: 1500-2000	5	1750	8750	13.9	
Farmers worked with: 2000-2500	7	2250	15750	19.4	
Farmers worked with: 2500-3000	6	2750	16500	16.7	1597.2
	36		57500		

Source: Field data, September 2005.

Mobility

Table 4 shows the personnel who are mobile for effective delivery of extension service. The result shows that 76.2% of personnel attached to the programme had one means of transport or the other. Mobility is essential for extension service delivery and enhances successful extension service delivery.

Table 4: Distribution of Personnel by access to mobility

Personnel	Percentage (n = 36)
Personnel with mobility	76.2
Personnel without mobility	23.8

Source: Field data, September 2005.

Characteristic of the programme

Table 5 shows that majorities (81.7%) of the respondents were males and 18.3% were females. This implies that, more men were benefiting from the programme. Traditionally, men farm these crops, more than women. Table 5 also shows that majority of the respondents (48.3%) were within the age bracket of 41 – 59 years. This was followed by 23.3% of those who fell within 51 – 60 years of age. The mean age was determined to be 44.5 years. The implication of this finding is that more of the middle aged (41 – 50) and the aged people (51-60) are involved in the programme than the youth. Though the programme was designed to include the youth, it was seemingly dominated by the aged people because of the increasing number of retirees in the farming system.

As also indicated in Appendix 1, majority of the respondents (95.3%) were married, 28.3% of the respondents had household size of 14 and above, with 10 as the average number of person per household. The implication of this finding is that large household size may be an advantage to farmers in term of farm labour supply. Chidebelu, (1990) stated that, the family is the most important input of unpaid labour.

Majority (48.4%) of the respondents had tertiary education (OND, HND, NCE, BSc, MSc, B.Ed), 23.3% had secondary education, 15% had primary education and 13.3% had no formal education. This implies that, a greater percentage of 86.7% respondents in the study area are literate and more likely to be responsive to agricultural extension programmes and policies. These findings agrees with that of

Anyanwu, Olowu, and Igunnu (1994) that, the literacy level of our rural farmers is on the increase, because the increasing number of those that farm in the rural locations are urban dwellers (retired civil servants, business men and politicians) who have formal education.

When respondents were asked about their major occupation, a majority, (59.2%) said they were farmers, 40.0% civil servants. This finding shows that majority of the respondents were practicing farmers.

Provision of inputs for the programme

Funding Respondents were asked about the timeliness of fund release, and a majority (64.6%) said that funds were not released as and at when due. The untimely release of fund will adversely affect the overall performance of agricultural programmes. CBN, (1999) had earlier cautioned that the constraints hampering agricultural production Nigeria is the untimely release of fund.

Budgetary allocations to the programme

Table 6 reveals the amount allocated to the Special Crop Production Programme (SCPP) in the last five years (2001 – 2005) and the percentage released.

Table 6: Percentage distribution of respondents based on funds release.

Year	Amount allocated (Millions)	Amount released (Millions)	Percentage
2001	20.00	19.00	95.0
2002	20.00	10.00	50.0
2003	25.00	18.00	72.0
2004	25.00	22.85	91.4
2005	200.00	197.45	98.7

Source: BNS MANR data, 2005.

Table 6 shows that, the highest amount allocated to the programme was in the year 2005 when the programme was restructured.

Timely/sufficient inputs provided for the implementation of the programme.

Table 7 shows that, majority of the respondents (58.3%) indicated that inputs were not sufficiently provided. Majority of the respondents (71.1%) also agreed that, the inputs were untimely provided. This shows that, the inputs were not sufficiently procured for sale to the farmers and also not available at the right time needed for effective execution of the programme. Asiegbu, (1990) and Agwu, (1996) earlier opined that, factors influencing the adoption of new technology are the availability, accessibility, and affordability of agricultural inputs. According to them, new technologies require reasonable relevant inputs such as improved seeds, fertilizers, agro-chemicals, credit and technical equipment to enhance successful implementation. The finding shows that farmers have difficulties with timely and sufficient provision of inputs in the implementation of the programme. Table 7 also shows that, 83.3% of the farmers agreed that tractor services were made available to farmers. This they indicated enabled the increase hectrage under cultivation.

When respondents were asked if loans were made available to them, majority (66.7%) reported that loans were not made available to them. This is because the loans available in the SCPP programme was the input loans as opposed to the traditional cash loan like farmers where used to. This raises the need to help the poor to assess affordable credit services (International Food Policy research Institute, IFPRI, 2008).

This implies that implementation of the programme have hitches or problems. MOF (2002) opined that, financial resources in form of loans to farmers are very necessary for any programme to be successful, since farmers need to put in more financial resources to acquire the desired result in any new programme introduced.

Table 7: Distribution of inputs for the programme as perceived by farmers

Inputs available	Percentage
Enough inputs provided	41.7
Timely availability of inputs	22.9
Tractor services available to farmers	83.3
Availability of loans to farmers	20.8
Extension services available for the programme	16.7

Source: Field data, September 2005. Multiple responses recorded.

Also indicated in Table 7 is the poor availability of extension services (16.7%) for the programme. This implies that the extension service available for the programme is not sufficient for effective implementation of the programme and this is one of the major constraints. Sammy, (1998) in his investigation of the transfer of corn technologies in Egypt found that one of the constraints to the adoption of corn technologies was lack of knowledge by farmers. Fai-Cassino, (2004) also affirmed that, with insufficient extension agents, farmers in remote areas will have no idea that government provides them with technical assistance, thereby relying on the traditional methods of agriculture inherited from their ancestors.

Conclusion

Based on the major finding, the following conclusions were drawn. Majority (76.9%) of the programme participants (84.5%) were not involved in the planning of the programme. Majority of farmers acquired one to two hectares of farm land through family inheritance, and 89.9% mostly used manual labour with only 10.1% using mechanized labour. Most (79.6%) farmers use improved seeds and 94.4% apply fertilizer on their crops no matter how inadequately applied. However, most of the fertilizers (48.2%) were purchased mostly from the open market.

The Majority of farmers were male and within the age bracket of 41-50, which means they were in their productive age. Most farmers had large family size which was an added advantage for employing manual labour.

Release of funds for programme implementation was inadequate and untimely provided, Similarly loans were not provided to enhance effective implementation of the programme, At the same time, other farm inputs were inadequately and untimely provided such that, farmers were forced to acquire them in the open market at high prices.

Recommendations

Based on the findings and conclusions, the following recommendations are made:

- Policy should be put in place to ensure early procurement and distribution of inputs at affordable prices.
- Stakeholders should intensify the mobilization and organization of farmers into farmers into farmers association and cooperatives to help pull farm lands, input procurement, and access to the use of machinery and providing market outlets

from disposing farmers' outputs. This way a veritable extension policy for crop production will be ensured in Nigeria.

- More extension personnel should be employed to reduce the high ratio of extension/farmer contact. The agency should make a deliberate policy for training its manpower to graduate and postgraduate level to put them in a better position to interpret research findings to farmers.

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Appendices**Appendix 1: Percentage distribution of respondents by personal characteristic (n=120)**

Characteristic X	frequency	Percentage
Sex:		
Male	98	81.7
Female	22	18.3
Age:		
21 – 30	8	5
31 – 40	24	20
41 – 50	58	48.3
51 – 60	28	23.3
61 – 70	4	3.3
44.5		
Marital Status:		
Married	115	95.8
Single	5	4.2
Size of Household		
1 – 3	3	2.5
4 – 6	29	24.2
7 – 9	31	25.8
10 – 12	23	19.2
14 and above	34	28.3
10.0		
Level of Education:		
No formal education	16	13.3
Primary education	18	15.00
Secondary education	28	23.3
Tertiary education	44	48.4
Religion		
Christianity	118	98.4
Islam	1	0.8
Traditional	1	0.8
Major Occupation		
Farming	71	59.2
Trading	1	0.8
Civil servant	47	40.0
Artisan (skilled work men)	1	0.8

Source: *Field data, September 2005*

Technical Efficiency of Small-Holder Cocoyam Farmers in Anambra State, Nigeria: Implications for Agricultural Extension Policy

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Abstract

This study employed the Cobb-Douglas stochastic frontier production function to measure the level of technical efficiency in small-holder cocoyam production in Anambra state, Nigeria. A multi-stage random sampling technique was used to select 120 cocoyam farmers in the state in 2005 and from them input-output data were obtained using the cost-route approach. The parameters of the stochastic frontier production function were estimated using the maximum likelihood method. The result of the analysis shows that individual farm level technical efficiency was about 95%. The study found education and farming experience to be positively and significantly related to technical efficiency at 1% while practice index, fertilizer use and membership of cooperative societies also had a direct relationship with technical efficiency and were significant at 5% level. Age and farm size had an indirect relationship with technical efficiency and was significant at 1% and 5% level respectively. There were no significant relationship between technical efficiency and knowledge index, credit access and family size. Expected increases in agriculture require increase in agricultural productivity. In other words, agricultural productivity very much depends on the efficiency of the production process. Hence, policies designed to educate people through proper agricultural extension services will have a great impact in increasing the level of efficiency and hence agricultural productivity of these farmers.

Key words: Technical Efficiency, Stochastic Frontier Production Function and Extension Service.

Introduction

Root and tuber crops which are among the most important groups of staple foods in many tropical African countries (Osagie, 1998) constitute the largest source of calories for the Nigeria population (Olaniyan *et al.*, 2001). Cassava (*Manihot esculenta*) is the most important of these crops in terms of total production, followed by yam (*Dioscorea spp*), cocoyam (*Colocasia spp* and *Xanthosoma spp*) and sweet potato (*Ipomoea batatas*) (Olaniyan *et al.*, 2001). Cocoyam which ranks third in importance and extent of production after yam and cassava is of major economic value in Nigeria (Udealor, *et al.*, 1996). Edible cocoyam cultivated in the country is essentially species of *Colocasia* (taro) (Howeler *et al.*, 1993) and *Xanthosoma* (tannia). Currently Nigeria is the world's largest producer of cocoyam; however, most of the production comes from the southeastern part of the country. The average production figure for Nigeria is 5, 068,000mt which accounts for about 37% of total world output of cocoyam (FAO, 2006).

Small scale farmers, especially women who operate within the subsistence economy grow most of the cocoyam in Nigeria. Nutritionally, cocoyam is superior

to cassava and yam in the possession of higher protein, mineral and vitamin contents in addition to having a more digestible starch (Parkinson, 1984, Splitstoesser *et al.*, 1973). It is highly recommended for diabetic patients, the aged, children with allergy and for other persons with intestinal disorders (Plucknet, 1970). According to Ene (1992) boiled cocoyam corms and cormels are peeled, cut up, dried and stored or milled into flour. The flour can be used for soups, biscuits, bread and puddings for beverages. The peels can also be utilized as feed for ruminants.

Despite the importance of cocoyam, more research attention has been given to cassava and yam (IITA, 1992; Tambe, 1995). Skott *et al.* (2000) observed that research on cocoyam has trailed behind that of other staples in Nigeria and other countries. Ezedinma (1987) had earlier noted that the totality of published scientific work on cocoyam is insignificant when compared with those of rice, maize, yam and cassava. However, Skott *et al.* (2000) asserted that it was only in the last decade that policy makers and national agricultural research systems began to show systematic interest in the crop because of concern over biodiversity. There is a declining trend in cocoyam production as well as a shortage of its supply in domestic markets as a result of a number of technical, socio-economic and institutional constraints, which need to be addressed.

According to Ayichi and Madukwe (1996) the effort of the Federal Government of Nigeria to address these problems was articulated and institutionalized through the formation of the public extension system (Agricultural Development Programme) in every state. The role of agricultural extension in identifying, adapting and sharing technologies that are appropriate to the needs of individual farmers within diverse agro-ecological and socioeconomic contexts can not be overemphasized. Government uses extension as a support service as well as a policy instrument for influencing farmers' behaviour to achieve its policy goals. The central objective of the public extension system is to raise the incomes of the small holder farmers through increased productivity. However, one of the major problems of the agricultural system is the inadequate knowledge of farmers' production situations and technical efficiency levels. Hence, technical efficiency measurement of the activities of farmers engaged in agriculture has been a major challenge to extension workers and researchers in Nigeria. Empirical studies in developing countries suggest that farmers are unable to utilize maximum potentiality of technology due to their management capacity. Technical efficiency here refers to the ability to produce the highest level of output with a given bundle of resources.

This study therefore, sought to assess the technical efficiency of cocoyam farmers and to identify the underlying factors influencing the technical efficiency of farmers, using the stochastic frontier Cobb-Douglas production function.

Methodology

The Theoretical Model

A stochastic frontier production function is defined by:

$$Y_i = f(X_i; \beta) \exp (V_i - U_i), \quad i = 1, 2, \dots, n \quad \dots \dots \dots (1)$$

Where Y_i is output of the i -th farm, X_i is the vector of input quantities used by the i -th farm, β is a vector of unknown parameters to be estimated, $f(\)$ represents an appropriate function (e.g Cobb Douglas, translog, etc). The term V_i is a symmetric

error, which accounts for random variations in output due to factors beyond the control of the farmer e.g. weather, disease outbreaks, measurements errors, etc. The term U_i is a non negative random variable representing inefficiency in production relative to the stochastic frontier. The random error V_i is assumed to be independently and identically distributed as $N(0, \sigma_v^2)$ random variables independent of the U_i s which are assumed to be non negative truncation of the $N(0, \sigma_u^2)$ distribution (i.e. half-normal distribution) or have exponential distribution. This stochastic frontier model was independently proposed by Aigner, *et al.*, (1977) and Meeusen and van den Broeck (1977). The major advantage of this method is that it provides numerical measures of technical efficiency. The technical efficiency of an individual farmer is defined in terms of the ratio of the observed output to the corresponding frontier output, given the available technology.

Technical efficiency (TE) = Y_i/Y_i^*

$$= f(X_i; \beta) \exp(V_i - U_i) / f(X_i; \beta) \exp(V_i) = \exp(-U_i) \dots \dots \dots (2)$$

Where Y_i is the observed output and Y_i^* is the frontier output. The parameters of the stochastic frontier production function are estimated using the maximum likelihood method.

Analytical Framework

For this study, the production technology of cocoyam farmers in Anambra State, Nigeria is assumed to be specified by the Cobb-Douglas frontier production function defined as follows:

$$\ln Y_i = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + e \dots \dots \dots (3)$$

Where Q is output of cocoyam in kg.; X_1 is farm size in hectares; X_2 is labour input in mandays; X_3 is fertilizer input in kg; X_4 is cocoyam setts planted in kg; X_5 is capital input in naira made up of depreciation charges on farm tools and equipment, interest on borrowed capital and rent on land; X_6 is other inputs in Naira, $b_0, b_1, \dots b_6$ are regression parameters to be estimated while V_i and U_i are as defined earlier. In addition, U_i is assumed in this study to follow a half normal distribution as is done in most frontier production literature.

Determinants of Technical Efficiency

Identifying the determinants of efficiency is a major task in efficiency analysis. In order to determine factors contributing to the observed technical efficiency in cocoyam production, the following model was formulated and estimated jointly with the stochastic frontier model in a single stage maximum likelihood estimation procedure using the computer software Frontier Version 4.1 (Coelli, 1996).

$$TE_i = a_0 + a_1 Z_1 + a_2 Z_2 + a_3 Z_3 + a_4 Z_4 + a_5 Z_5 + a_6 Z_6 + a_7 Z_7 + a_8 Z_8 + a_9 Z_9 \dots \dots \dots (4)$$

Where TE_i is the technical efficiency of the i -th farmer; Z_1 is farmers age in years; Z_2 is farmers level of education in years; Z_3 is the knowledge index (about extension services); Z_4 is the practice index (technologies adopted); Z_5 is farm size in hectares; Z_6 is farmer's farming experience in years; Z_7 is fertilizer use, a dummy variable which takes the value of unity for fertilizer use and zero otherwise; Z_8 is credit access, a dummy variable which takes the value of unity if the farmer has access to credit and zero otherwise; Z_9 is membership of farmers associations/cooperative societies, a dummy variable which takes the value of unity for members and zero otherwise; Z_{10} is family size; while $a_0, a_1, a_2, \dots a_{10}$ are

regression parameters to be estimated. We expect $a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9$ and to be positive and a_1 and a_{10} negative.

Study Site and Sampling Procedure

Anambra State is one of the 36 states of Nigeria and is located in the South Eastern zone of the country. It was created in 1991 with a population figure of 4.182 million people (NPC, 2006) and a land mass of 4415.54 square kilometers, (Nkematu, 2000). The state is divided into four agricultural zones of Aguata, Anambra, Awka and Onitsha and is further delineated into 24 extension blocks. Farming is the predominant occupation of the people, majority of who are small holders. The major available crops are yam, cassava, rice, maize, cocoyam, cowpea, tomatoes and vegetables, while the livestock produced in the state include poultry, sheep, goats and to some extent pig.

Both purposive and multi-stage random sampling techniques were employed in selecting the sample for this study. In the first stage, three out of the four agricultural zones were purposively selected on the basis of the intensity of cocoyam production. The selected zones were Aguata, Awka and Onitsha. In the second stage, two extension blocks were randomly selected from each agricultural zone (Aguata and Nnewi North from Aguata zone, Awka North and Anaocha from Awka zone as well as Idemili North and Ihiala from Onitsha zone), giving a total of six blocks. In the third stage, 2 circles were randomly selected from each block, giving a total of 12 extension circles. Finally, 10 farmers were randomly selected from each circle for detailed study, giving a total sample size of 120 farmers for the study. Data were collected by means of structured questionnaire on the socio-economic characteristics of the farmers, and their production activities in terms of input, output, and their prices for the year 2005 using the cost-route approach.

Results and Discussion

Average Statistics of Cocoyam Farmers

The average statistics of the sampled cocoyam farmers are presented in Table 1. On the average, a typical cocoyam farmer in the state was 50 years old, with 4 years of education, 13 years of farming experience and an average household size of 12 persons. The average cocoyam farmer cultivated 0.27 ha, used about 21.74kg of fertilizer and 250kg of cocoyam setts and spent about ₦2405 on capital inputs. The table further shows that an average cocoyam farmer in the state employed 41.8 mandays of labour and produced an output of 1691kg of cocoyam per annum. Cocoyam production in the state is a female dominated occupation as about 74% of the farmers were females. Skott *et. al.*, (2000) also reported that cocoyam is a woman's crop.

Table 1: Average Statistics of Cocoyam Farmers in Anambra State, Nigeria.

S/No	Variables	Mean Value	Maximum Value	Minimum Value
1	Farm size (ha)	0.27	1.50	0.01
2	Labour (mandays)	41.80	141.3	5.76
3	Fertilizer input (kg)	21.74	96.4	0.00
4	Cocoyam setts (kg)	250.25	250.25	50.00
5	Capital input (₦)	2405.10	11300.00	176.00
6	Age (yrs)	50.00	75.00	24.00
7	Education (yrs)	4.00	10.00	0.00
8	Farming Experience (yrs)	13.00	50.00	3.00
9	Household size (No)	12.00	18.00	4.00
10	Output (kg)	1691.00	10907.00	68.00
11	Other inputs (₦)	111.86	750.00	0.00
12	Female farmers (%)		74.00	

Source: Survey data, 2005

Estimated Production Function

The Maximum Likelihood (ML) estimates of the Cobb-Douglas stochastic frontier production parameters for cocoyam are presented in Table 2. The coefficients of farm size, labour, fertilizer and cocoyam setts have the desired positive signs and are statistically significant at 1% showing direct relationship with output. This implies that a 1% increase in any of these variables would increase farm size, labour, fertilizer and cocoyam setts by 0.3106%, 0.3312%, 0.0905% and 0.2114% respectively, the coefficients for capital and manure were positive but not statistically significant even at 10% level.

The estimated variance (σ^2) is statistically significant at 90% indicating goodness of fit and the correctness of the specified distribution assumptions of the composite error term. Besides, the variance of the non-negative farm effects is a small proportion of the total variance of cocoyam output. Gamma (γ) is estimated at 0.4264 and is statistically significant at 1% indicating that only 42.64% of the total variation in cocoyam output is due to technical inefficiency.

Table 2: Estimated Cobb-Douglas Stochastic Frontier Production Function for Cocoyam in Anambra State, Nigeria

Variables	Parameters	Coefficients	Standard Error	t-value
Production factors				
Constant term	β_0	10.4652	0.1113	94.0270***
Farm size	β_1	0.3106	0.0488	6.3647***
Labour	β_2	0.3312	0.1016	3.2598***
Fertilizer	β_3	0.0905	0.0339	2.6670***
Cocoyam Setts	β_4	0.2114	0.0733	2.8840***
Depreciation	β_5	0.0358	0.0231	1.5498
Manure	β_6	0.1635	0.1156	1.4144
Efficiency factors				
Constant term	α_0	3.8472	0.5821	6.6092***
Age		-0.8974	0.1709	-5.2510***
Levels of Education	α_2	2.7804	0.7697	3.6123***
Knowledge index	α_3	0.0292	0.4583	0.0637
Practice index	α_4	0.0175	0.0084	2.0833**
Farm size	α_5	-0.0037	0.0016	-2.3125**
Farm Experiences	α_6	0.7009	0.2317	3.0250***
Fertilizer use	α_7	0.6011	0.2355	2.5524**
Credit Access	α_8	0.0271	0.0614	0.4215
Membership of coop. societies	α_9	0.0728	0.0343	2.1224**
Family size	α_{10}	0.8523	0.6058	1.4068
Diagnostic statistics				
Total Variance (Sigma squared)	σ^2	0.9092	0.2537	3.5837***
Variance Ratio (Gamma)	γ	0.4264	0.1169	3.6475***
LR Test		27.1344		
Log-Likelihood Function		-8.4718		

Source: Computed from frontier 4.1 MLE results/Surveys data, 2005, *** and ** are significant levels at 1.0% and 5.0%.

The frequency distribution of technical efficiency in cocoyam production is presented in Table 3. Individual technical efficiency indices range between 65.04% and 97.31% with a mean of 95.15%. About 93.3% of the cocoyam farmers had technical efficiency indices of above 80%. The high levels of technical efficiency obtained in this study are consistent with the low variance of the farm effects.

Table 3: Frequency Distribution of Technical Efficiency in Cocoyam Production in Anambra State Nigeria 2005

Technical Efficiency Range(%)	Frequency	Relative Frequency
≤60	0	0
61-70	4	33.3
71-80	6	5.00
81-90	17	14.17
91-100	93	77.50
Total	120	1000
Mean technical efficiency	95.15	
Minimum technical efficiency	57.23%	
Maximum technical efficiency	97.31%	

Source: Field Survey, 2005

Sources of Technical Efficiency

The estimated determinants of technical efficiency in cocoyam production as presented in Table 2 shows that age had a negative and significant effect on efficiency, which agrees with a priori expectation at 1.0% level of probability. This implies that increasing age would lead to increased technical inefficiency. Ageing farmers would be less energetic to work, leading to low productivity as well as low technical efficiency, this is in line with the findings of Ajibefun and Daramola (2003) and Ajibefun and Aderionla (2004). The results show that educational level of a farmer, and practices of cocoyam technologies (practical index) have positive and significant impact on technical efficiency at 1% and 5% level respectively. This indicates that farm level technical efficiency can be increased by additional investment in education including schooling and training/orientation. Farmer's knowledge index about the available crop technologies as well as access to credit had a positive relationship with technical efficiency but was not significant. The coefficient for level of experience was positive and significant at 1% level. In other words, more experienced farmers are expected to have higher levels of technical efficiency than farmers with lower farming experience.

The coefficient of farm size is negative and statistically significant at 5% indicating an indirect relationship between farm size and technical efficiency. Lau and Yotopoulos (1971) found out that smaller farms were economically more efficient than larger farms within the range of output studied. If farm size is small, farmers are able to combine their resources better (Hazarika and Subramanian, 1999). The coefficient of fertilizer use is also positive and statistically significant at 5% showing a direct relationship between fertilizer use and technical efficiency. Fertilizer, an improved technology, shifts the production frontier upwards leading to higher technical efficiency. This result is consistent with the findings of Hussain (1989). The coefficient of membership of farmers' associations / cooperative societies is positive and statistically significant at 5% showing a direct relationship between membership of farmers' associations/cooperative societies and technical efficiency. Members of farmers' associations or cooperative societies have more access to agricultural information, credit and other production inputs as well as more enhanced ability to adopt innovations than non-members. However, family size has a direct relationship with technical efficiency but was not significant.

Conclusion

The results of this study indicate that technical efficiency in cocoyam production in Anambra State, Nigeria is relatively high. Individual levels of technical efficiency range between 57.23% and 97.31% with a mean of 95.15%, suggesting that opportunities still exist for increasing productivity and income of cocoyam farmers in the state by increasing the efficiency with which resources are used at the farm level. Important factors directly related to technical efficiency are age, education, practical index, farm size, years of experience, fertilizer use and membership of farmers' associations/cooperative societies. These results call for policies aimed at encouraging the youths who are agile and stronger to grow cocoyam. There is need to improve farmers' access to fertilizer, extension contact and membership of farmers' associations/cooperative societies as measures for increasing technical efficiency in the study area. Technical efficiency can be further improved through provision of training/orientation to the farmers, especially toward farming practices. Women play a significant role in cocoyam production in the study area. Therefore agricultural extension policies designed to improve women access to land, fertilizer, credit, agricultural extension services, new technologies, more education especially to the girl child, will be crucial in increasing technical efficiency. The need to involve farmers more in the extension process itself should be encouraged.

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Issues for Agricultural Extension Policy: Structures and Institutional Arrangement

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Abstract

This paper examined issues pertaining to structures and institutional arrangement for agricultural extension policy. It highlighted the broad objectives of the new policy thrust in agriculture in Nigeria, and identified sub-policies that were expected to facilitate growth of the agricultural sector of the economy. Agricultural extension, among others, was identified as an integral part of the agricultural policy. Transfer of agricultural information and innovations was highlighted as the prime responsibility of agricultural extension. It was observed that extension has not lived up to this responsibility due to a number of reasons, principal among which is inadequate funding among others. The Agricultural Development Programmed (ADP) was identified as the institutional agency responsible for the transfer of agricultural information and innovations to farmers. The ADP was observed to operate the Unified Agricultural Extension System (UAES) using the Training and Visit (T&V) extension system. In order to ensure effectiveness in the discharge of its mandate to its clientele, the extension agency needed to maintain working linkages with research organisations/ institutions. About 15 national agricultural research institutes, which are mainly concerned with technology (innovation/ knowledge) creation / development, were identified. Also three universities of agricultures as well as faculties of the conventional universities in the country were identified. The need to secure a stable and sustained source of financing agricultural extension was identified as the most difficult and challenging policy issue facing the agricultural extension services in Nigeria today. It was recommended that a legal legislative action be put in place, which would, among other things, define the responsibilities of the various tiers of government towards financing agricultural extension services in Nigeria. It was also recommended that a demand-driven (private) extension service be institutionalized to thrive along with the UAES, which has often been seen as part of the social services rendered by government for the farming populace.

1.0 Introduction

1.1 Agriculture in Nigeria: Overview of the New Policy Thrust

Nigeria's agricultural policy has been described as the synthesis of the framework and action plans of government designed to achieve overall agricultural growth and development. The policy aims at the attainment of self-sustaining growth in all the sub-sectors of agriculture and the structural transformation necessary for the overall solid-economic development of the country as well as the improvement in the quality of life of all Nigerians (FRN, 2001).

The broad policy objectives were stated as:

- i. attainment of self-sufficiency in basic food commodities with particular reference to those which consume considerable shares of Nigeria's foreign exchange and for which the country has comparative advantage in local productions;
- ii. increase in production of agricultural raw materials to meet the growth of an expanding industrial sector;

- iii. increase in production and processing of exportable commodities with a view to increasing their foreign exchange earning capacity and further diversifying the country's export base and sources of foreign exchange earnings;
- iv. modernization of agricultural production; processing, storage and distribution through the infusion of improved technologies and management so that agriculture can be more responsive to the demands of other sectors of the Nigerian economy;
- v. creation of more agricultural and rural employment opportunities to increase the income of farmers and rural dwellers and to productively absorb an increasing labour force in the nation;
- vi. protection and improvement of agricultural land resources and preservation of the environment for sustainable agricultural production;
- vii. establishment of appropriate institutions and creation of administrative organs to facilitate the integrated development and realization of the country's agricultural potentials (FRN, 2001).

The foregoing highlighted the broad policy objectives of agriculture in Nigeria. It must be stated and unequivocally too, that the policy is all embracing and has all it takes to transform the agricultural sector of the Nigerian economy into the desired stated. Perhaps what is most expedient is to create an enabling environment, possibly by infusing the desired level of funding which will ensure implementation of the policy objectives for the common good of the Nigerian nation. As a means of ensuring implementation, the agricultural policy is supported by sub-policies that facilitates the growth of the sector. These sub-policies, according to FRN (2001) cover issues of labour, capital and land whose prices affect profitability of production systems; crops, fisheries, livestock and land use; input supply, pest control and mechanization; water resources and rural infrastructure; agricultural extension, research, technology development and transfer; agricultural produce storage, processing, marketing, credit and insurance; cooperatives, training and manpower development, agricultural and information management.

It must be observed that agricultural extension is an integral part of the new policy thrust in agriculture in Nigeria. It is indeed the subject matter of a sub-policy which is expected to facilitate the growth of the agricultural sector of the Nigerian economy. Under this sub-policy, a nationwide, unified and all-inclusive extension delivery system under the Agricultural Development Programme (ADP) was put in place in a joint Federal and State Government Collaborative effort (FRN, 2001).

The clarion call, therefore, is for the various tiers of government as well as other stakeholders to put in place an enabling environment, allocate and ensure judicious use of scarce funds/ other resources and also to muster the guts to ensure strict implementation of the policy as well as the sub-policies in agriculture with a view to realizing the stated policy objectives for the common good of all Nigerians.

1.2 The role of agricultural extension

Agricultural extension is a difficult term to define precisely. It is known to have different meanings at different times, in different places, to different people. Maunder (1973), defined agricultural extension as a service or system which assists farm people through educational procedures, improved farming methods and techniques, increase production efficiency and income, better their levels of living, and lift the social and educational standards of rural life. On the other hand, agricultural extension has also

been viewed as the promotion of any aspect of technology development: how people acquire the necessary resources, how new technologies are evolved, what influences their choice, the kind of support a given technology requires, how its adoption can be financed and encouraged, and the kind of protection it entails (Moris 1991, Amalu 1998). This definition according to Amalu (1998) is all-encompassing in the sense that it embraces all types of technology and all types of support. He contended that this is especially so since any technology can become the thrust of promotional activity by any agency.

Thus it is the responsibility of agricultural extension to transfer agricultural information and innovations to farmers as well as ensure adoption of same for the socio-economic development as well as improvement in the levels of living of the citizenry (farmers).

Ene-Obong (2007) posited that agricultural practices must change in tropical Africa in order to achieve the millennium development goals in agriculture. According to him these countries can no longer rely completely on traditional systems that result in poverty and hunger. He maintained that new technologies still lie in Universities and crop improvement centres that require more effective and practical extension services in order to deliver to the growers.

This implies that the existing extension delivery system has not lived up to expectation. Onu, (1988) stated that the performance of Nigeria's rural development and public extension agencies has not been particularly satisfactory. More so, the ineffectiveness and inefficiencies, which characterize the public extension service, have given rise to the wide-call for a private sector-driven extension services (Ozor and Madukwe, 2005). There is therefore the need to strengthen the existing extension delivery service in the country to make it more effective and efficient. To achieve this onerous task, agricultural extension deserves to be appropriately funded by government as well as all other stakeholders in agriculture in Nigeria.

1.3 Structures and institutional arrangement for agricultural extension practice in Nigeria

The new policy thrust in agriculture, among other things, stated that a nationwide, unified and all inclusive extension delivery system under the Agricultural Development Programme (ADP) was put in place in a joint Federal and State Government collaborative effort. Apantaku et.al. (2005) pointed out that in Nigeria, the responsibility of transferring agricultural information and innovations to farmers is usually coordinated by government owned agricultural extension outfits. This responsibility is presently discharged nationwide by the ADPs (Apu, 2006).

Each of the thirty six states including the Federal Capital Territory in Nigeria has an Agricultural Development Programme (ADP). Each of the ADPs operates a Unified Agricultural Extension System (UAES), Agbamu, (2006). According to Agbamu (2006), today, Nigeria operates the Unified Agricultural Extension System (UAES) using the principle of the Training and Visit (T and V) extension system. He contended that the UAES arose from the National Policy on Unification of Extension service approved by the National Council for Agriculture at its 1989 meeting in Maiduguri. Again at its Port Harcourt meeting in February, 1990, further clarifications on the implementation of the policy on UAES were made and states were advised to adopt the system as a matter of urgency (Mijindadi, 1991).

The concept of unification of extension services which came into being in 1990 implies that parallel extension services carried out by state and Federal Ministries of Agriculture as well as specialized development schemes ceased to exist (Agbamu, 2006). According to him, the ADPs have full administrative control over the entire agricultural extension services covering crops, livestock, fisheries, agro-forestry and off-farm production. This implies that the ADPs have well articulated organizational structures, which clearly assigns responsibilities to each of the operators of the programme in each of the states of the federation.

In order to ensure the attainment of the policy objectives of agriculture in general and extension in particular, the Agricultural Extension Agency-ADP maintains close and permeable collaboration with research organizations. This implies establishing linkages between the extension and research organizations. Agbamu (2006) stated that linkage between agricultural research and extension organizations is to a large extent characterized by constant interaction among the personnel of both sides. According to him, in order to foster strong linkages between agricultural research and extension organizations, continuous communication at different levels of the administrative hierarchy and during activities of field personnel become imperative. This is not only aimed at developing appropriate technologies that are geared toward solving the problems of farmers, but also at creating the necessary awareness among all the stakeholders (including extensionists and farmers) that will lead to adoption of those technologies.

There are about fifteen National Agricultural Research Institutes in Nigeria today as well as three other agro-industrial research institutes (Akpabio, 2005). These include:

- Cocoa Research Institute of Nigeria, (CRIN), Ibadan;
- Institute for Agricultural Research (IAR), Zaria;
- Institute of Agricultural Research and Training (IAR and T), Ibadan;
- Lake Chad Research Institute (LRCI) Maidugiri;
- National Agricultural Extension and Research Liaison Services (NAERLS), Zaria;
- National Animal Production Research Institute (NAPRI) Zaria;
- National Cereals Research Institute (NCRI) Badeggi;
- National Institute for Freshwater Fisheries Research (NIFFR) New Bussa;
- National Institute for Horticultural Research (NIHORT) Ibadan;
- National Root Crops Research Institute (NRCRI) Umudike, Abia State;
- National Veterinary Research Institute (NVRI) Vom, Plateau State;
- National Institute for Oceanography and Marine Research (NIOMR), Lagos;
- Nigerian Institute for Oil Palm Research (NIFOR) Benin City;
- Rubber Research Institute of Nigeria (RRIN) Benin City;
- Nigerian Stored Products research Institute (NSPRI) Illorin.

Each of these national agricultural research institutes has its own research mandate, along which lines they mirror their research activities. Technologies developed by these research institutes are diffused and communicated to the target audiences (mainly farmers) by the extension agency, represented by the ADP. This is with a view to ensuring adoption of the innovations for purposes of enhancing the socio-economic development of the farmers as well as raising their levels of living.

In addition to these national agricultural research institutes, there are also three universities of agriculture as well as the faculties of agriculture of the conventional universities in the country. The universities of agriculture include: The Michael Okpara University of Agriculture, Umudike in Abia State; The University of Agriculture, Abeokuta in Ogun State, and the University of Agriculture, Makurdi in Benue State. Each of these knowledge creation centres conduct research into various facets of agriculture as well as engage in the extension of its research results to the ultimate end users.

1.4 Policy issues challenging agricultural extension in Nigeria

The most difficult and challenging policy issue facing the agricultural extension service today is how to secure a stable source of funding (Agwu and Chukwuone, 2005). According to them, since the 1980's funding of agro-technology generation and transfer became an increasingly important policy issue. They contended that this is because of progressive decline in financial support for extension. This decline is occurring in a situation where funding of extension has been chronically inadequate (Agwu and Chukwuone, 2005). They have also argued that, although the ADPs have been very successful development initiative, the programme, especially since 1995, has suffered serious setbacks due to poor funding and funding instability following the expiration of the World Bank's component of the funding arrangement. They maintained that contributions from States and Federal government always fall, grossly, short of budget, hence hindering the proper implementation of extension programmes in the ADPs.

Consequent upon the foregoing, a legislative action is therefore proposed. The proposed legislation is expected not only to lay a solid foundation for a sustainable extension delivery service in Nigeria, but also to clearly define the responsibilities of the various tiers of government towards funding agricultural extension delivery in the country. This has become expedient because according to Contado (1997) countries that have enacted extension policy through legislative action tend to have well organized, financially stable extension system that have sustained effectiveness and cumulative impact. He gave examples of legislative extension policies which have worked well to include:

- The Cooperative Extension Services in the United States, which was established through the Smith-Lever Act of May 8, 1914;
- Japan's Cooperative Agricultural Extension Services, which came into being through the Japanese Agricultural Promotion Law of 1948;
- The Agricultural Extension Policy in South Korea which is embodied in the 1957 Agricultural Extension Law and in the Rural Development Law of 1962;
- Thailand's agricultural extension policy which was codified in the 1956 Law that created the Development of Agricultural Extension as one of nine departments of the Ministry of Agriculture and Cooperative;
- Zimbabwe's Department of Agricultural Technical Extension Services, which was established by law in 1981.

The proposed legislative action is expected to go a long way in redressing the problem of inadequate funding of extension delivery service in the country.

Further to this, it is also recommended that a demand-driven (private) extension strategies/service be institutionalized to thrive along with the UAES, which is often seen as part of the social services rendered by government to the farming populace.

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