INFLUENCE OF EXTENSION CONTACT AND FARMERS' SOCIO-ECONOMIC CHARACTERISTICS ON ADOPTION OF OIL PALM TECHNOLOGIES IN ANIOCHA NORTH LOCAL GOVERNMENT, DELTA STATE, NIGERIA

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ABSTRACT
Many factors have been found to affect farmers' adoption of new technologies by different authors, which include extension contact and socio-economic characteristics of farmers. The study therefore assessed the influence of extension contact and farmers' socio-economic characteristics on adoption of oil palm technologies in Aniocha North local government area of Delta State, Nigeria. With the assistance of the extension agents and contact farmers, a two–stage random sampling technique was used for the random selection of one hundred (100) respondents for the study. Findings show that majority of the respondents were males (74.0%). About 70% of the respondents were within the age bracket of 20-50 years with a majority (85%) having non-formal, primary and secondary education qualifications. Most of the respondents (92%) were small scale farmers having farm sizes ranging from 1-5 hectares with more than 16 years of farming experience (60%). About 53% of the respondents had contact with extension agents and the contact was mostly on monthly basis, which respondents felt was not effective. Majority of the respondents were not aware of some of the major oil palm technologies which probably lead to non-adoption of most of these major technologies. The perceived major constraints for the adoption of the major oil palm technologies were inadequate information (M = 4.77), capital (M=4.77), high cost of input (M=4.49), and irregular extension contact (M = 4.56). The regression analysis shows that respondents' years of farming experience (b = 2.786), farm size (b = 1.879) and frequency of extension agents' contact with respondents (b = 2.534) had significant association with adoption of technologies. The study recommended the assistance to farmers by subsidizing farm inputs and increase the number of extension agents.

Key words: Extension agents' contact, farmers' characteristics, technology adoption

1.0 INTRODUCTION

The oil palm is an economic tree crop and highest source of vegetable oil, which makes it to be one of the major sources of income to rural farmers (Omoti, 2003). According to Omoti, the bulk of Nigeria's estimated 2.5 million hectares of oil palm production is under the natural and semi-wild grove stand while only about 10% of it is under large, medium and small scale plantations.

Nigeria used to be the largest producer of oil palm in the world but according to Hartley (1988), the country lost her foremost place in oil palm exports to Zaire and regained it temporarily in 1964 – 1965 but later lost to Malaysia as the largest oil palm producer in the world today. As a result of this, Nigeria became a substantial importer of palm oil by the late 1970s and 1980s (Hartley, 1988). This could be due to the fact that the production of oil palm from wild breed using local cultural practices and processing, cannot meet the demand of the ever-increasing population of Nigeria and also to make appreciable contribution to the nation's gross national product.

The Nigerian Institute for Oil Palm Research (NIFOR) has developed new technologies which aim at improving the production of oil palm in Nigeria. Some of the practices are ring weeding, planting of cover crops, use of knife for harvesting, chisel, use of polythene bags, NIFOR hybrid (Tenera), and NIFOR sprouted seeds (NIFOR, 2003).

The role of extension service in getting improved technologies to the farmers cannot be overemphasised. The purpose of training and visit (T&V) system of agricultural extension is to build a professional extension service that is capable of assisting farmers to raise production and increase their income and to provide appropriate support for agricultural development (Benor and Baxter, 1984). Extension agents play the role of disseminating these technologies to farmers (Agumagu and Nwaogwugwu, 2006).

Ejembi *et al.*(2002) reported that socio-economic characteristics of farmers affect adoption of technologies. Onyenwaku (1989) and Iwueke (1989) also found education and contact with extension service to be positively and significantly associated with adoption of seed-yam minisett technique in Imo State of Nigeria. Similarly, Asiabaka, *et al.* (2001) expressed the view that, 'for farmers of different agricultural zones to adopt a new agricultural technology, they must be aware of the technology, have valid and up-to-date information on the technology, the applicability of the technology to their farming system and receive the technical assistance necessary to the technology.'

This therefore, points to the importance of extension contact and socio-economic characteristics of farmers in adoption of improved technologies. Determining the influence of these factors on a tree crop like oil palm will be useful in formulating adequate policies that will assist oil palm farmers to solve imminent problems.

1.1 Objectives

The general objective was to assess the influence of extension contact and farmers' socio-economic characteristics on adoption of oil palm technologies so as to reveal the constraints faced by oil palm farmers.

The specific objectives were to:

(i) Determine the socio-economic characteristics of the respondents.
(ii) Assess the level and frequency of extension contact with the respondents and their perception of extension contact effectiveness
(iii) Identify the respondents' level of awareness and adoption of oil palm technologies
(iv) Identify respondents' constraints on oil palm technology adoption and production.

The following hypotheses were tested:

$H0_1$: There is no significant relationship between respondents' socio-economic characteristics and adoption of oil palm technologies.

$H0_2$: There is no significant relationship between respondents' contact with extension agent and their adoption of oil palm technologies.

2.0 METHODOLOGY

The study was carried out in Aniocha North Local Government Area of Delta State. Delta State lies in the Southern part of Nigeria and has a tropical climate with two distinct seasons, the dry and wet seasons. Average rainfall is between 1800 mm and 3000 mm. Temperature ranges between 39 ^{0}C and 44 ^{0}C , while the vegetation ranges from mangrove swamps along the coastal region to the rain forest zone in the middle and the savannah in the north. The major crops cultivated in the state are yam, cassava, plantain, maize, oil palm, rubber and vegetables.

The target population for the study was the oil palm farmers who are many in Aniocha North Local Government Area. A two-stage random sampling technique was used for the study. Through the assistance of extension agent, the contact farmers that have the list of registered oil palm farmers in each community were identified. The first stage was the random selection of 5 out of the 17 communities. The selected communities were Agba with 45 registered farmers, Ogbe Obi with 52 farmers, Ushi with 35 farmers, Ishiekpe with 44 farmers and Umuolo with 55 farmers making a total population of 231 registered farmers. Since the number of registered farmers in each community were not the same, the second stage was the proportional random selection of 20 farmers from each community from the list of farmers obtained from the contact farmers in each community to make a total of 100 respondents for the study.

The instrument for data collection was a structured interview schedule, which was validated by some experts from Agricultural Economics and Extension Department, University of Benin.

The interview schedule was divided into two (2) sections. Section A contained information on the socio economic characteristics of the respondents while section 'B' provided information on influence of extension contact, awareness of oil palm technologies, level of adoption and constraints to oil palm production. The developed interview schedule also included a 5-point Likert-scale, ranging from 5= very serious, 4= serious, 3= undecided, 2 not serious, and 1= not very serious) for measuring the constraints to oil palm production. Two enumerators and the researchers administered the interview schedule.

The data collected were analysed using descriptive statistics such as

percentages, frequencies, means, and standard deviation and inferential statistics such as multiple regressions.

3.0 RESULTS AND DISCUSSION

The results in Table 1 show the socio-economic characteristics of the respondents. The results show that males (74%) are more involved in oil palm production than females (26%). The age distribution of the oil palm farmers indicates that majority of the respondents were below 51 years old (76%) and married (76%).The findings agrees with that of Obinne and Anyanwu (1991) that the mean age of male farmers in their study was 45 years and that of females were 40 years. Results also show that 80% of the respondents' had education level from secondary education to no formal education which indicates that respondents' level of education was very low. Table 1 also shows that 92% of farmers own 1-5 ha of land which is an indication that majority of the respondents are small scale oil palm farmers' The results agreed with the view of Erie (1996) that the small farming holdings constitute more than 70% of all farming activities in Nigeria.

Only a few (20%) of the respondents belonged to co-operative society, while majority subscribed to village associations.

Table 1: Distribution of respondents' according to socio-economic

characteristics.

Socio-economic characteristics	*frequency*	*%*
Gender		
Male	74	74.0
Female	26	26.0
Age		
<30	33	33.0
31 – 40	20	20.0
41 – 50	23	23.0
51 and above	24	24.0
Marital Status		
Single	24	24.0
Married	76	76.0
Religion		
Christianity	82	82.0
Islam	8	8.0
Others	10	10.0
Educational Level		
No formal education	27	27.0
Primary education	34	34.0
Secondary education	25	25.0
Territory education	14	14.0
Years of Farming Experience		
<5 years	8	8.0
6 – 10 years	15	15.0
11 – 15 years	11	11.0
16 – and above	66	66.0
Farm Size		
1 – 5 ha	92	92.0
6 – 10 ha	7	7.0
11 and above	1	1.0
House Size		
1 – 5	41	41.0
6 – 10	45	45.0
>10	14	14.0
Membership of Association		
Co-operative society	20	20.0
Village association	80	80.0

3.1 Respondents' Perception on their Contact with Extension Agents

Table 2 shows the respondents' perception about their contact with extension. The results show that just above 50% (53%) had contact with extension agents. The majority of those who had contact with extension agents (75.5%) indicated that the frequency of contact was mostly on monthly basis. These results are in contrast to the recommendation of the T and V system that extension agents should have contact with farmers fortnightly, which might probably be as a result of low ratio of extension agents to farmers.

Table 2 also indicates that respondents perceived that the extension agents' contact with them was not effective. This may also be attributed to the inability of the extension agents to visit the farmers fortnightly as recommended in the T and V system.

Table 2: Respondents' perception of their contact with extension agents

	Yes		*No*	
	Freq.	*%*	*Freq.*	*%*
Contact with extension agents	*53*	*53.0*	*47*	*47.0*
Frequency of contact with extension agents			**Frequency**	
%				
Weekly Fortnightly	27		3.7713.21	
Monthly	40		75.47	
Yearly	4		7.55	
Contact effectiveness				
Very effective	5		9.43	
Effective	10		18.87	
Not effective	38		71.70	

Source: Field Survey 2006.

3.2 Respondents' Awareness of Oil Palm Technologies

Table 3 shows the level of respondents' awareness of oil palm technologies. The results show that the majority of the respondents were not aware of important technologies such as the tenera hybrid (73%), spouted seeds (81%), ring weeding (86%) and use of cover crops (60%). However, majority of the respondents were aware of the hardware technologies such as the use of polythene bags (94%) and harvesting knife (95%). The non-awareness of the major technologies might be due to low frequency of extension contact with the farmers so as to provide adequate information on the technologies.

Table 3: Distribution of respondents by level of awareness of oil palm

technologies

Technologies/Practices	Aware Freq.	%	Not aware Freq.	%
Tenera	27	27.0	73	73.0
Use of poly bag	94	94.0	6	6.0
Spouted seeds	19	19.0	81	81.0
Ring weeding	14	14.0	86	86.0
Cover crop	40	40.0	60	60.0
Chisel	53	53.0	47	47.0
Harvesting knife	95	95.0	5	5.0
Fertilizer usage	50	50.0	50	50.0

Source: Field Survey 2006.

3.3 RESPONDENTS' LEVEL OF ADOPTION OF OIL PALM TECHNOLOGIES

Table 4 shows the level of adoption of some technologies. The results show that some technologies such as tenera variety (87%), spouted seed (92%), use of cover crop (92%) and ring weeding (57.0%) were not adopted by the farmers. This means that the technologies that the respondents adopted were those they were aware. These results confirm the views and findings of many researchers that for adoption of improved technologies to take place, there must be awareness of those technologies (Osuji, 1983, Onyenwaku and Mbuba, 1991, Agwu, 2001, Ajayi, 2002 and Asiabaka, *et al*, 2001).

Table 4: Distribution of respondents' by level of adoption of oil palm technologies

Technologies/Practices	Never used Freq.	%	Still Using Freq.	%	Used and discontinued Freq.	%
Tenera variety	87	87.0	13	13.0	0	0.0
Use of Polythene. bag	29	29.0	46	46.0	25	25.0
Spouted seed	92	92.0	5	5.0	3	3.0
Ring weeding	57	57.0	25	25.0	18	1 8.0
Use of cover crop	99	99.0	0	0.0	1	1.0
Use of Chisel	1	1.0	98	98.0	1	1.0
Harvesting knife	20	20.0	45	45.0	35	35.0
Fertilizer application	59	59.0	25	25.0	16	16.0

Source: Field Survey 2006.

3.4 Respondents' Perceived Constraints to the Adoption of Oil Palm Technologies and Production

Table 5 shows the major constraints affecting the respondents' adoption of technologies and oil palm production. The results show that the major constraints are inadequate information (M = 4.77), capital (M = 4.69), high cost of input (M = 4.64), and irregular extension visit (M = 4.56). These results corroborate the importance of extension service in providing adequate information on improved technologies to farmers. These results agree with that of Ajayi and Oloruntoba (2004) that adequate information and extension agents follow up are useful for farmers' adoption and continued usage of improved technologies.

Table 5: Respondents' perceived constraints to adoption of oil palm technologies

Constraints	Mean (M)	Standard Deviation
Inadequate information	4.77	0.446
Capital	4.69	0.643
High cost of input	4.64	0.825
Irregular extension visit	4.56	0.732
Lack of improved seeds	4.40	0.810
Transportation	4.04	0.820
Pest and disease	3.97	0.870
Processing	3.72	0.975
Land	3.45	0.833
Rotting of fruit	3.44	0.946
Storage	2.80	0.964

Likert-Scale: 5= very serious, 4= serious, 3= undecided, 2, not serious, 5= not very serious).

3.5 Relationship between Respondents' Socio-economic Characteristics, Contact with Extension Agents and Adoption of

Oil Palm Technologies

The results for the relationship between the socio economic variable and adoption of innovations are presented in Table 6. The R^2 value of 0.650 for the variables implies that about 65% of socio-economic and extension contact variables jointly had influence on adoption of respondents. The regression analysis results show that the respondents' farm size (b = 1.879) and years of farming experience (b = 2.876) had significant influence on adoption at $p < 0.05$. The significant influence of farm size on adoption agrees with the view of Siyanbola (1991) who identified farm size as a significant factor associated with adoption. Similarly, the significant influence of farming experience on adoption may be due to the risk involved in adoption. The small farmers with their limited resources will be more reluctant to take risk than the larger farmers and the more experienced the farmers, the more they will be willing to take risk associated with new farming methods. However, it is interesting to note that the level of education did not have significant influence as it is expected that the better the educational qualification, the better the perception and adoption. According to Akinbile (2003), the more literate farmers are, the more they comprehend technologies more than others.

The result of respondents' contact with extension agent and adoption shows that extension contact did not have any significant influence on the adoption of technologies (b = 0.965, $p < 0.05$). However, the frequency of extension agents' contact had significant influence on adoption of technologies (b = 2.534, $p < 0.05$). The result obtained here may mean that extension agents just having contact with farmers may not have much impact but the frequency of the contacts could have much impact. The results corroborate the results obtained in Table 2 where about 75.47% of the respondents indicated monthly contact with extension agents. This may be due to the fact that for adoption to take place there must be adequate information about the technology, which the extension agents have to do frequently with the farmers. According to Agwu (2001), one major reason for non-adoption or rejection of technologies is lack of adequate information about the technologies.

Table 6: Relationships between respondents' socio-economic characteristics,

Socio-economic characteristics	Regression coefficient	Standard Error	T-value
Gender (X_1)	0.835	0.361	1.236
Age (X_2)	1.561	0.634	1.365
Marital status (X_3)	0.632	0.072	1.224
Religion (X_4)	0.684	0.526	0.673
Educational level (X_5)	0.989	0.804	1.456
Farming experience (X_6)	2.876	0.324	4.575*
Farm size (X_7)	1.879	0.317	3.894*
Household size (X_8)	0.654	0.856	0.075
Extension contact (X_9)	0.965	0.087	1.42
Frequency of extension contact (X_{10})		2.534	0 . 8 4 3 4.368*
Regression constant	1.900	0.649	0.075
R^2	0.650		

*Significant at 0.05 level

4.0 CONCLUSIONS AND RECOMMENDATIONS

The results of study have shown that extension agents play a vital role in passing information across to the farmers for adoption of technologies and improved production especially the frequency of extension agents visits to the farmers. The study has also shown that socio-economic characteristics of farmers play a major role in adoption of oil palm technologies. In addition, the study has identified some of the major constraints that could affect adoption of oil palm technologies such as inadequate information, capital, and high cost of inputs, irregular extension visits and lack of improved seeds.

Based on the results of this study, the following recommendations are suggested for the improvement of oil palm production:

(i) There is a need for review of policies for land use in Nigeria for expansion of farms as oil palm cultivation requires large expanse of land.

(ii) There is a need for improved funding for agricultural development Programmes(ADPs) in order to recruit more extension agents so as to have more frequentcontact with cash crop farmers like the food crop farmers as the ratio of extensionworkers to farmers is vital for effective contact.

(iii) Government should assist farmers by subsidizing farm inputs such as fertilizers and chemicals

(iv) With the availability of many micro-finance banks now in Nigeria, farmers shouldform cooperatives so as to be able to get loans to improve their capital forexpansion of their farms.

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