DETERMINANTS OF FARMERS' WILLINGNESS TO PAY FOR AGRICULTURAL EXTENSION SERVICES IN SOUTH-EASTERN NIGERIA

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ABSTRACT

The study examined the determinants of farmers' willingness to pay for extension services in south-eastern Nigeria. The study was prompted by the inefficient and ineffective provision of extension services by the public extension services delivery. Data were collected with structured and validated questionnaire from 360 randomly selected farmers. Data were analyzed using mean perception scores, standard deviation and logistic regression model. The results showed that majority of the farmers (65%) were males. The result also revealed that such socio-economic variables like level of education, farm size, income and farming experience had a direct relationship to farmer's willingness to pay for extension services. The constraints identified by the study as serious issues for farmers willingness to pay for extension services included; free government extension services, scarcity of farm inputs, previous trainings received in agriculture by farmers and financial incapability. The study recommended that younger farmers with high levels of education, income and large farm sizes should be targeted for privatization of extension services.

Key words: Willingness to pay and Agricultural extension services

INTRODUCTION

In many developing countries, agricultural development is hinged on extension services by helping farmers to identify, analyze and link research with their production problems. They give awareness on opportunities for improvement of farm yields leading to increased income and better standard of living (Van den ban and Hawkins, 1998). Agbamu and Okagbare (2005) stated that through agricultural extension services, dissemination of information on agricultural technologies and improved practices to farm families, farmers' capacity building through the use of a variety of communication methods and training programmes are carried out. In addition, they assist farmers in making their decisions by providing range of options on a given innovation from which they can choose, thereby helping them to develop themselves and have insight into the consequences of each option.

Effective extension system needs to be continuously updated and fine-tuned by new information derived from research that is relevant to farmers needs (Picciotto and Anderson, 1997). In the recent past extension services have been provided by government to farmers without due consideration whether the recipients really required the information provided, resulting to ineffective and inefficient information dissemination routines. Idachaba (2005) stated that the most significant shortcomings of public agricultural extension in general have been unresponsiveness to the variation in farmers needs, lack of ownership by intended beneficiaries, limitation in the quality of field and technical staff and unstable policy and political support. He stated that the old Anyigba Agricultural Development Project was denied needed political support by the then Benue State Government which led to its atrophy.

Okoro et al., 2006 observed that governments' dwindling development budgets and extremely poor progress in raising economic and social well-being of the populace through public extension have led to calls for private sector involvement in the provision of extension services. According to Rivera and Cary, (1997), public sector extension is facing criticism and is confronted with a number of possibilities for change because of its lack of efficiency. The questions that arise in the introduction of free paying extension system in subsistence dominated agriculture as in Oyo state particularly and Nigeria in general is that whether it will lead to better efficiency, equity and effectiveness in serving both the subsistent and commercial farmers. In Nigeria, several studies have examined the effectiveness of public extension systems (Obinne, 1992) and perceived effect of privatization of extension services (Oladele and Obuh, 2008).

Willingness to pay for agricultural services is influenced by a number of paradigms including the innovation-diffusion model (Makokha et al., 1999), economic constraints model (Pitt and Sumodiningrat, 1991) and the adopter's perception model (Adesina and Baidu-Forson, 1995). Innovation-diffusion model may include factors the respondents may have been exposed to in relation to the extension services being targeted including duration, regularity of services, and quality of the services and the effectiveness of its delivery. Attitude and confidence toward using the precision agricultural technologies,   perceptions of benefit, farm size and farmers educational levels positively influenced the intention to accept precision agricultural technologies (Adrian, et al., 2005). Services being tested are evaluated by receptors on relevance that will increase and value within his/her environment. Relevance and quality of research information was perceived to be influenced by proximity to source of trials and the attitude towards the sourced organization (Llewellyn, 2007). Economic importance of animal husbandry enterprise and respondent's socio-economic characteristics influenced livestock producers' demand for private veterinary services including clinical services, artificial insemination, vaccination and health services in the high potential agricultural areas of Kenya (Tambi et al., 1999). This study sought to access the determinants to farmers' willingness to pay for extension services in south-eastern Nigeria

METHODOLOGY
The area of study is south-eastern Nigeria. Southeast Nigeria is made up of five states: Abia, Anambra, Ebonyi, Enugu and Imo. It has a total population of 16.38 million people with about 75 percent or 8.78 million in rural areas, of which about 49.38 percent are women (National Population Census, 2007). The occupation of the populace is basically farming, combined mainly with non-farm activities in varying degrees. The people are mainly of Igbo tribe of Nigeria. Dominant arable crops of the area include rice, yam, cassava, maize, cocoyam, and vegetables. Backyard poultry keeping and small ruminant animal production dominate the livestock industry in the area while muturu cattle rearing are an exception, and limited mainly to parts of Enugu and Ebonyi States. A multistage random sampling was adopted for this study. In the first stage, three states; Ebonyi, Enugu and Imo were randomly selected from the five states of south-eastern Nigeria. This was followed by a random selection of three local government areas (LGA) from each state. This gave a total of nine local government areas for the study. They include; Ohaozara, Abakaliki, Ishielu, Awgu, Nsukka, Udi, Onuimo, Owerri North and Ideato South. This was followed by a random selection of two communities from each LGA to give a total of eighteen(18) communities for the study. They include; Okposi, Uburu, Nkaliki, Agbaja, Ezillo, Nkalagu, Agwu, Mgbowo, Opi, Edem Ani, Amokwe Ngwo, Okwelle, Okwe, Emekuku, Orji, Dikenafai and Isiekenisi. Lastly twenty two (22) farmers who had contact with extension agents were sampled to give a total of three hundred and ninety six (396) farmers. Three hundred and sixty (360)

questionnaires, which represented ninety one percent (91%) were retrieved and used for further analysis. Interview schedule was used to elicit information from the farmers. Simple percentage and regression analysis were used for the analysis of data.

RESULTS AND DISCUSSION
Social and Economic Characteristics of Respondents
The socio-economic characteristics of the farmers which include; gender, age, educational qualification, farm size, income, marital status, house hold size and farming experience were presented and discussed.

Gender plays a vital role in customary determination of rights to land control and ownership. Tables 1 showed that majority of the farmers in the study area were males (65%) while female farmers represented only 35% of the farming population sampled. This result is consistent with gender role pattern of people where fathers play dual roles of house-hold and farm family heads. There is however exceptional cases where roles are reversed particularly where the man is not alive. Moreover, land acquisition system in the area place greater control of land on the male members of the family who are more likely to seek out extension services. The findings of Foti *et al*., (2007) showed that male-headed households were associated with a higher willingness to pay for service extension than other house hold typologies (female and child headed households).

Majority of the farmers (70%) were aged between 31 and 50 years. The table also showed that 21.94% of the farmers belong to the age range of 51- 60 years. Farmers 30 years and below constituted 3% and 60 years and above constituted 14% of the farming population. Oladele, (2008) stated that the younger the farmers, the more they are willing to pay for extension services. The average age of the respondents was found to be 43 years. The results also showed that middle aged farmers were involved more in farming than the very young ones and elderly people. The result is in line with the findings of Onoh (2004) who stated that younger and older farmers are less flexible in changing an old culture than the middle aged farmers who are restless and ready to explore and experiment in anticipation of breakthroughs. These middle aged farmers will therefore be more willing to pay for extension services.

It is assumed that level of formal education is directly related to the rate at which farmers would seek for extension services or willing to pay for them. Analysis of the data showed that 34% of the farmers did not go to school at all, while 42% representing the majority spent 1-6 years at school. Those that spent 7-12 years were 13% of the population, while 10% and 1% spent 13-18 and above 19 years at school respectively. The mean years spent at school was 4.4 years. Okoro *et al*., (2006) stated that technological changes are achieved through formal education. Foti *et al*., (2007) and Oladele (2008) all noted that the level of education of farmers is positively related to their willingness to pay for extension services.

It is assumed that the farm size holding determines the extent a farmer will accept innovations and his willingness to pay for such services. The farm size was measured as the total farm-holdings a farmer operated. The results show that 74% of the farmers had between 1-4 hectares of land, 10% and 19% of the respondents operated less than a hectare and between 5 and 6 hectares of land respectively. Only seven percent of the farmers operated more than 6 hectares of farm land. The mean size cultivated was 3 hectares. Foti *et al*., (2007) reported that the degree of commercialization of farm enterprises, farm income, farm size and

attitude of the farmer significantly affected the demand for private fee for service extension in Zimbabwe.

Table 1. Frequency Distribution of Respondents according to Socio-Economic Characteristics

Variable	Frequency	Percentage
Gender		
Male	233	65
Female	127	35
Total	**360**	**100**
Household size (mean = 6.3 persons)		
<4	34	9.44
4-6	106	29.44
7- 9	110	30.56
10-12	27	21.40
13-15	17	4.72
>15	16	4.44
Total	**360**	**100**
Years spent in school (mean=4.4)		
No formal education	122	34
1-6	150	42
7-12	47	13
13-18	36	10
>18	2	1
Total	**360**	**100**
Age (mean= 43 years)		
21-30	15	3.39
31-40	101	28.06
41-50	151	41.94
51-60	79	21.94
>60	14	3.89
Total	**360**	**100**
Total Farm Size (mean 3 ha)		
<1	35	9.7
1-2	97	26.9
3-4	134	37.3
5-6	70	19.4
>6	24	6.7
Total	**360**	**100**
Income Level(N,000/annum)		
<30	51	14.17
31-50	44	12.22
51-70	41	11.39
71-90	106	29.44
>90	118	32.78
Total	**360**	**100**

Source: Field Survey 2010

It is assumed that the income level of farmers has a direct relationship with their willingness to pay for agricultural extension services. The income of respondents from farming was analyzed and presented. It showed that 23.61% of the respondents earned #31,000 –#70,000 per annum, while 29% earned between #71,000 to #110,000. The highest income of above #110,000.00 was earned by 33% of the respondents. The mean income was #69,000.00 per annum. The income distribution has no pattern. This may likely be because most rural farmers do not keep good farm records and were not able to determine their income. Foti *et al*., (2007) stated that high incomes are associated with a greater ability to buy. It therefore implied that farmers with higher income would be more willing to pay for extension services. The result indicates that farmers in the study area have access to family farm labour. The household sizes of farmers often determine the level of family labour available for farm and related operations. Result of data analyzed showed that 30% of the respondents had an average household size of 4-8 persons; those with 9-11persons was 21-40%, while the household with 12-13persons was 4.72% of the sampled respondents, with membership households above 13 as 4%.The mean household size was 6persons.

The results in Table 1 showed that most of the farmers are experienced. About 52.78% of the respondents had more than 20years of farming experience, while only 6.39% had 1-5 years. The mean years of the farmers experience in farming was computed as 16.2 years. High level of farming experience puts a farmer in a position to appreciate the value of agricultural extension and willing to pay for its services when necessary. Oladele (2008) reported that with longer farming experiences farmers of Oyo state, Nigeria were willing to pay for extension services.

The results in table 2 show possible constraints of farmer's willingness to pay for extension services. Farmers indicated free extension services provided by government as the most limiting factors for their willingness to pay for extension services with a mean value of 3.3 and standard deviation of 0.73. This implies that farmers did not see any reason paying for a service that was already provided free by government but experiences in many countries show that inefficiencies are unavoidable if a service such as agricultural extension is provided free of charge to the adheres. Scarcity of farm inputs was another serious constraint noted by farmers for their willingness to pay for extension services, with a mean value of 3.2 and standard deviation of 0.59. They also indicated previous trainings received in agriculture as another important constraint with a mean value of 3.2 and standard deviation of 0.74. Farmers also noted their financial incapability as another serious limiting factor paying for extension services with a mean value of 3.2 and standard deviation of 0.78. The subsistence nature of Nigeria's agriculture makes farming to be very unprofitable; thus any additional cost on the farmers would be resisted.

They however did not see the following as constraints to their willingness to pay for extension services; lack of knowledgeable extension agents, unprofitability of farm business and irrelevant nature of extension packages.

Table 2: Frequency distribution, mean, standard deviation of possible constraints to farmer's willingness to pay extension services

Constraints	Strongly agree		Agree		Disagree		Strongly disagree		$\overline{X}$	S.D
	F	%	F	%	F	%	F	%		
Free extension services	180	50	120	33.3	40	11.1	20	5.6	3.3	0.73
Scarcity of farm inputs	170	47.2	130	36.1	40	11.1	20.	5.6	3.2	0.59
Lack of knowledgeable extension agent	40	11.1	70	19.4	200	55.6	50	13.9	2.3	0.67
Unprofitability of farm business	30	8.3	60	16.7	230	63.9	40	11.1	2.2	0.54
Poor attitude of government towards agriculture	80	22.2	60	16.7	180	50	40.	11.1	2.3	0.83
Previous trainings received byfarmers in agriculture	160	44.4	120	33.3	60	16.7	20	5.6	3.2	0.74
Financial incapability of farmers	180	50	100	27.8	60	16.7	20	5.6	3.2	0.78
Unavailability of extension agents	80	22.2	60	16.7	180	50	40	11.1	2.5	0.83
Irrelevant nature of extension packages to the farmers needs	30	8.3	60	16.7	200	55.6	70	19.4	2.1	0.58

Source: Field Survey (2010)

Table 3 shows the factors influencing farmers' willingness to pay for extension services, the logistic regression model was employed. Firstly, tests were conducted to check the presence of multi-collinearity between the independent or explanatory variables. Tests indicated that no such econometric problem existed. Consequently, all the explanatory variables were entered and the equation fitting the logic regression model was estimated and the results are presented on table 3. The table shows that variables relating to age (X_2), level of education (X_3), farm size (X_4), farm income (X_5), house hold size (X_7), and farming experience (X_8) were found to be highly significant at 1% level of probability, implying that these variables were the important factors influencing farmer's willingness to pay for extensions services in the study area. The coefficient of sex (X_1) and marital status (X_6) were not significant at 1% level of probability, implying that these variables were not important factors influencing farmers willingness to pay for extension services in the study area. The coefficient of age (X_2) is negative and significant. This inverse relationship implies that as the farmer gets older, his willingness to pay for extension services decreases. The coefficient of level of education (X_3) was positive and significant, implying that the more educated farmers are, the more willing they are to pay for extension services than the less educated ones.

The coefficient of farm size (X_4) was positive and significant. This direct relationship implies that farmers that have large farm sizes were more willing to pay for extension services than farmers that have small farm sizes in the study area. The coefficient of farm income (X_5) was positive and significant. This direct relationship suggests that farmers that earn high farm income from their production activities were more willing to pay for extension services than farmers that earn low farm income in the study area.

The coefficient of household size (X_7) was negative and significant. This inverse relationship implies that farmers that have more persons in their household size were less willing to pay for extension services than farmers that have few persons in their households in the study area. The coefficient of farming experience (X_8) was positive and significant, which implies that farmers that acquired more experience in farming in the study area were more willing to pay for extension services than new entrants into farming business. The logistic regression model produced high chi-square value which implied that the logistic regression model gave a good fit to the variables regressed.

Table 3. Estimates of the influence of selected variables on the probability of farmer's willingness to pay for extension services

Explanatory variables and important statistics	Logistic Regression coefficient	t-ratio
Sex (X_1)	0.0649	1.2637
Age (X_2)	-0.0991	-4.0121*
Level of education (X_3)	0.0827	3.7763*
Farm size (X_4)	0.0185	3.0411*
Farm income (X_5)	0.0887	3.4379*
Marital status(X_6)	0.0887	1.2936
House hold size (X_7)	-0.0653	-2.8641*
Farming experience(X_8)	0.0872	2.6863*
Constant	-27.0156	-6.2891*
Chi-square	70.4609	
Sample size	360	

* Significant at 1% level, Source: Field Survey data, (2010).
CONCLUSION

The study showed that farmers' socio-economic characteristics like level of education, income, farm size and farming experience had direct relationship to their willingness to pay for agricultural extension services, implying that these variables were the important factors influencing farmers' willingness to pay for agricultural extension services in the study area. The coefficient of age is negative and significant. This inverse relationship implies that as the farmer gets older, his willingness to pay for extension services deceases. The study therefore recommends that younger farmers with high levels of education, income and large farm sizing should be targeted for privatization of extension services in the area.

REFERENCES

Adesina, A.A. and Baidu-Forson, J., (1995). Farmers' perception andadoption on new agricultural technology: evidence from analysis in Burkina Faso and Guinea, WestAfrica. Agricultural Economics 13, 1-9

Adrian, A.M., Norwood, S.H. and Mask (2005) Producers' perceptions and attitudes toward precision agriculture technologies . Computers and Electronicsin Agriculture 48: 256-271

Agbamu, J. U. and G. O. Okagbare (2005). Institutional Strengthening of Ogun State ADP upon Expiration of World Bank Assistance. *In: Orheruata, A.M, Nwokoro, S.O., Ajayi*, In G. N. Asumugha, A. O. Olojede, J. G. Ikeorgu, A. O. Ano and U. *Herbert (eds),Repositioning Agriculture for Sustainable Millennium Development Goals in Nigeria. Proceedings of the 40th Annual Conference of the Agricultural Society of Nigeria (ASN)*, held at National Root Crops Research institute, Umudike, Abia State, Nigeria. October 16th – 20th, p. 297

Foti R., Nyakudya I., Moyo M., Chikuvire J.,Mlambo N. (2007): Determinants of Farmer Demand for "Fee-for-Service Extension in Zimbabwe: The Case of Mashonaland Central Province. *Journal of International Agricultural and Extension Education, 14(1): 95–104.*

Idachaba, F. S. (2005): Agricultural and Rural Development in Nigeria. The policy perspective. *A text of convocation Lecture Delivered at K.S.U. Anyigba on 11-march, 2005.pp 3 &4*

Llewellyn, R.S.(2007). Information quality and effectiveness for more rapid adoption decisions by farmers. Field Crops Research 104:148-156

Makokha, M.O., Maritim, H.K., Okalebo, J.R. and Iruria, D.M.,(1999). Farmers'perceptionsand adoption of soil management technologies in western Kenya. African Crop Science Journal 7, 549-558

National Population Census, (2007): Federal Government Printer Lagos Nigeria.

Obinne C. (1992): Agent Effectiveness in Nigeria.Journal of Extension, Fall 1992, 30 (3). Available athttp://www.joe.org/joe/1992fall/intl3.html

Okoro, B.O; Chukwu, G.O.; Onumadu T.; Okoye, B.C. (2006). Sustaining AgriculturalExtension through informal private sector Participation in Abia State. In G.N.Asumugha, A.O. Olojede, J.G. Ikeorgu, A.O. Ano and U. Herbert (eds),Repositioning Agriculture for Sustainable Millennium Development Goals inNigeria. *Proceedings of the 40th Annual Conference of the Agricultural Society ofNigeria (ASN),* held at National Root Crops Research institute, Umudike, AbiaState, Nigeria. October 16th – 20th, p.

Oladele, O. I. (2008): Factors determining farmers willingness to pay for extension services in Oyo State, Nigeria. *Agricultura Tropica Et Subtropica 41: (4)165- 169.*

Oladele O.I., Obuh J. (2008): Perceived Effect ofPrivatization of Extension Services among Researchers, tension Agents and Farmers in Oyo State, Nigeria.Medwell Journals, Agricultural Journal, 3 (5):409–413.

Onoh P. A.(2004). Evaluation of the effectiveness of unified Agricultural Extension Services in Enugu State of Nigeria. MSc. *Thesis, Department of Agricultural Economics, Extension and Managemen*t, Ebonyi State University, Abakaliki.

Picciotto, R. and Anderson, J. R. (1997). Reconsidering Agricultural Extension. *World Bank. Res Obs.*12: 249-259

Pitt, M., and G. Sumodiningrat. (1991). "Risk, Schooling and the Choice of SeedTechnology in Developing Countries: A Meta-profit Function Approach," *International Economic Review*, 32: (2) 457-473.

Rivera, W. M. and Cary, J. W. (1997): *Privatizing Agricultural Extension. A reference Manual, FAO, United Nations, Rome.*

Tambi, N.E., Mukhebi W.A., Maina, W.O and Solomon, H.M.(1999). Probit analysis of livestock producers' demand for private veterinary services in the high potential agricultural areas of Kenya. *Agricultural Systems* **59:** 163-176

Van Den Ban A. W., Hawkins H. S. (1998): Agricultural Extension. 2nd edition, *Blackwell Science, pp. 5–10.*