Determinants of Willingness to Pay for Private Extension Services by Crop Farmers in the Federal Capital Territory (FCT) Abuja, Nigeria

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The study analysed determinants of willingness to pay for private extension services among crop farmers in the Federal Capital Territory (FCT) Abuja, Nigeria. Primary data were collected from respondents using a structured questionnaire. Data were analysed using simple descriptive statistics and logit regression model. From the results, the mean age of respondents was 39 years. The mean annual income of respondents was ₦504,811.1 (SD = ₦767,997.7). Many (49.4%) of the farmers interviewed had between 6 – 10 persons in their households with an average household size of 8 persons. Majority (79.4%) of the respondents were male while only 20.6% of the respondents were female. Socioeconomic factors influencing crop farmers’ willingness to pay for private extension found in the study were age, income, membership of cooperatives and frequency of extension visits. Age was significant at 10% while Income and membership of cooperatives were both significant at 5% respectively. However, frequency of extension visits was significant at 1%. There should be deliberate policies that will draw younger Nigerian into farming as the study reveals that willingness to pay for private extension increases within the younger generation of farmers. Younger farmers have the innovativeness to incorporate vital innovations and modern technologies in farming.

Keywords: determinants, willingness to pay, private extension, crop, farmers.

INTRODUCTION

Agricultural extension educational programmes around the world have developmental roots, utilizing applied research knowledge to help farmers deal with identified problems focusing primarily on production practices (Harris et al., 1992). Agricultural extension involves various activities directed to improve food production and living standards of the people. Extension, therefore, requires direction and control of these activities in order to achieve the desired goals. Srivastava and Jaffe (1992) noted that extension serves as the link between farmers to transfer best practices of one farmer to another, to introduce or even enforce agricultural policies and report farmers problems back to research.

Economic impact studies on agricultural extension have shown positive effect of extension on technology adoption, farm productivity and farm profits. Asiabaka (2002) tried to look at Extension from modern perspective and thus, explained it from the aim, which extension seeks to accomplish; which is to teach both the rural and urban clientele how to determine their problems and be able to rise to such problems using their own resources. Asiabaka (2002) further described Extension as having three important dimensions namely; educational component, which involves changing the behaviour and attitude of the people, economic dimension, which includes; increased income of the clientele, increased crop yield, better financial management, better methods of food preservation, social dimension, which also includes; improved health of the clientele, leadership development, better grooming, development co-operation, increased zeal for development. He summarized that the clientele of extension are not only farmers, rather other members of the citizenry who will benefit from the extension service hence, extension education.

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Rivera et al. (2000) asserted that the public extension system is now seen as out dated top-down, paternalistic, inflexible, subject to bureaucratic inefficiencies and therefore unable to cope with the dynamic demands of modern agriculture. Furthermore, the public extension service delivery has proved to be too expensive with several aspects lying dormant and seeking to be removed and replaced with more viable ones. The bottleneck style bureaucracy that has been associated with extension delivery in Nigeria has left a number of important things to be desired in extension delivery. The most significant short coming of public agricultural extension in general has been unresponsiveness to the variation in farmer’s needs, lack of ownership by intended beneficiaries, limitation in the quality of field and technical staff, unstable policy and political support (Idachaba, 2005).

The private extension service system can be a viable replacement for the underperforming public extension system in today's modern agricultural revolution that seeks to position Nigeria as food secure and self-sufficient. The private extension service delivery provides clear specificity and preferences of the clients who employ their service. Also, the private extension service can be monitored and developed more rapidly than the public service. Farmers become key stakeholders and participate fully in determining the type of extension services they receive and the time they receive them.

Katz (2002) reported that women in a remote village of Northern Vietnam pay a public veterinarian for regular visits in their village to vaccinate piglets. They negotiated payment in kind where out of every six piglets raised to a marketable age, the women agreed to give one piglet to the veterinarian as remuneration. This formula greatly motivated the officers who ensured that as many piglets survived in as many households as possible. The case also shows that poor people in remote areas can and are willing to pay for useful services, provided that payment is in an appropriate form and pattern. Katz (2002) also reported that in Kyrgyzstan, farmers paid the extensionists for assistance in the preparation of a business plan if it resulted in the approval of their loan application. Field observations have also shown that livestock farmers in Nigeria do pay cash for veterinary services rendered to them, though undocumented, but the payment varies from location to location and also the mode of payment which is either in cash or kind depending on the agreement reached between the parties.

Problem Statement

Extension is the most pertinent aspect of modern agriculture. The evidence of its importance is seen clearly in the progress recorded by nations that have a strong and viable extension or agricultural advisory plan backing up a holistic national agricultural policy. Advisory services in the agricultural sector have consistently been an instrument for diversifying production and increasing the yield and income of rural farmers (Yu and Mwangi, 2014). The public extension service industry in Nigeria is underperforming given its basic statutory responsibilities. This is true for most public enterprises in Nigeria (Kenobi, 2015; Ekpo, 2012).

While the private sector driven agricultural extension service delivery system has been recommended in many studies (Engel et al., 2015; Mwaura et al., 2010; Horna et al., 2005), the economic capacities of individual farmers to actually purchase these custom services have come under serious questioning. The sustainability of a public advisory service depends on the resources available to the state, the provision of a private service depends on functioning market mechanisms and thus on the farmers’ willingness to pay (WTP) and capacity to pay (Ulimwengu, 2011).

Previous studies have identified the factors that determine willingness of farmers at different levels to pay for extension services (Ibrahim et al., 2014; Ozor et al., 2013; Oladele, 2008). This study was commissioned to identify the determinants of crop farmers’ willingness to pay for private extension on the basis of their socio-economic characteristics of farmers. Providing an empirical evidence for private extension in Nigeria will fill the gap in literature of the rationale for private extension and the socio-demographic characteristics of farmers that determine such willingness in the study area.

Research Questions

The salient questions that this study seeks to address therefore include:

i. What are the socio-economic characteristics of crop farmers in the FCT?
ii. What are the determinants of willingness to pay for private extension services among crop farmers?

Objectives of the Study

i. Describe the socio-economic characteristics of crop farmers in the study area;
ii. Identify the determinants of willingness to pay for private extension services among crops farmers.

LITERATURE REVIEW

Conceptual Framework

Willingness to Pay for Private Extension Services

Knowledge about a product’s or service’s willingness-to-pay on behalf of its potential customers plays a crucial role in many areas of marketing management like pricing decisions or new product and/or service development. Willingness to pay (WTP) is the maximum price at or below which a consumer will definitely buy one unit of a product [or service]. This corresponds to the standard economic view of consumer reservation price (Varian, 1992).
Willingness to pay (WTP) is a strong research approach that involves the targeted clients for potential services in establishing the preferences of the services proposed and the value the respondents are ready to pay. Mostly, WTP studies involve contingent valuation (CV) and hedonistic methods. WTP for a service is the maximum amount of money an individual would be willing to pay for goods or services rather than do without it. WTP studies are widely used in assessment of markets, goods, services by planners, entrepreneurs and for environmental valuation. In agriculture, WTP studies have been used to evaluate demand and cost curves for extension services delivery through commercial agents (Nambiro and Omiti, 2007).

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 Sumodingrat, 1991) and the adopter's perception model (Adesina and Baidu-Forson, 1995). Innovation-diffusion model may include factors the respondent 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 agriculture technologies (Adrian et al., 2005). Services being tested are evaluated by receptors on relevance that will increase effectiveness 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 husbandly 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).

The higher willingness to pay for extension services is associated with the market-oriented farming enterprises due to access to major urban centres including Kampala, Masaka, Entebbe, Mukono and Jinja. It also needs to be remembered that agricultural sector development has favoured the region ever since colonization and even the political crisis of the 1970s and 1980s did not completely disrupt the agricultural development activities in the region (Reinnikha and Collier, 2001).

Empirical Review

Ajayi (2006) studied farmers’ willingness to pay for extension services using the contingent valuation method (CVM): the case of Oyo State, Nigeria. The study observed that the majority of farmers were willing to pay for agricultural services if their income from farming were to increase in the future. Willingness to pay has been shown to vary with extension service quality. For example, the extension system in Malawi is considered inefficient and this is likely to be why Chirwa (2005) finds it to have no effect on adoption decisions. Gautam (2000) suggests that deterioration in the extension services in Kenya has reduced information access and contributed to a decline in agricultural productivity.

Demand for extension services can be evaluated through establishing the willingness to pay for the services among farmers. The success of private veterinary services in the Kenya high agricultural areas was to be influenced by both demand and the supply side of the services. Although demand for services among the targeted clients exists based on their enterprise and personal characteristics, understanding the demand side factors by the private veterinary providers and for governments wishing to privatize the delivery of veterinary services was recommended as necessary for effectiveness of the services (Tambi et al., 1999).

Ozor et al. (2013) in their investigation of farmers’ willingness to pay for agricultural extension service: Evidence from Nigeria observed the distribution of farmers according to the amount they can willingly pay for extension service and noticed that the distribution displays an inverse relationship between the percentage of farmers willing to make payments and the amount they can willingly pay. Results showed that a higher proportion of farmers (65.4%) were willing to pay ≤ N1,000. While only 2% can willingly pay over N10,000 annually. The few farmers on the extreme right-hand side of the X-axis represent mainly commercially oriented rich farmers.

Oladele (2008) researched into the factors determining farmers’ willingness to pay for extension services in Oyo State, Nigeria and discovered that 8 variables of the total analysed were statistically significant at 5%. These variables were: age, gender, Educational level, Farm size, farming experience, land tenure, income and proportion of crops sold. From the results it was deduced that the younger the farmers the more the willingness to pay for extension services and also the higher the level of education among farmers the more their willingness to pay for extension services. Of these eight significant variables, three were inversely related to willingness to pay for extension services. These were gender, farming experience and proportion of crops sold. This indicates that an increase in any of these variables will lead to a decrease in the probability of willingness to pay for extension services. Simply put, the more male farmers, with longer farming experience and high proportion of crops sold the higher the probability of the willingness to pay for extension services. As the farm size increases so does the probability of the willingness to pay.

In their study of farmers’ willingness to pay for seed-related information relating to rice varieties in Nigeria and Benin Republic, Horna et al. (2005) concluded that rice farmers...
participating in the project have a positive WTP value for information but mainly for hands-on experience (on-farm trials). Findings concerning the willingness to pay for seed-related information among participants support the hypothesis that extension activity has potentially positive marginal benefits.

**METHODOLOGY**

**Description of the Study Area**

This study was conducted in Abuja, the Federal Capital Territory (FCT) of Nigeria. The study area is located in the centre of the country in the guinea savanna of the middle belt between longitudes 6°20’E and 7°33’E of the Greenwich meridian, and latitudes 8°30’N and 9°20’N of the equator and occupies an area of about 8,000 square kilometres (http://www.fcda.gov.ng/index.php/about-fcda/the-geography-of-abuja). It is surrounded by Kaduna, Kogi, Nasarawa and Niger states to the North, South, East and West respectively with a population of about 776,298 (NPC, 2006). The projected human population at a population growth rate of 3% per annum was 1,146,563 persons for 2018. However, Jaiyeola (2016) reported that the human population in Abuja was over 6 million persons in 2016 probably due to huge immigrations from other parts of the country to the FCT.

The FCT experiences three weather conditions annually. This includes a warm, humid rainy season and a blistering dry season. In between the two, there is a brief interlude of harmattan occasioned by the Northeast trade wind, with the main feature of dust haze and dryness. The indigenous inhabitants of Abuja are the Gbagyi (Gwari) as the major language, Bassa, Gwandara, Gade, Ganagana, Koro among others. The FCT falls within the Guinean forest-savanna mosaic zone of the West African sub-region. Patches of rain forest, however, occur in the Gwagwa plains, especially in the rugged terrain to the South (southeastern) part of the territory, where a landscape of gullies and rough terrain is found (http://abujaglobalshapers.org/vegetation/). These areas of the Federal Capital Territory (FCT) form one of the few surviving occurrences of the mature forest vegetation in Nigeria.

![Map of FCT, Abuja. Source: Researchgate.net](image)

**Sampling Technique and Sampling size**

The study population comprised crop farmers in the FCT. The territory is currently made up of six Area Councils, namely: Abuja Municipal Area Council (AMAC) and five Area councils of Abaji, Bwari, Gwagwalada, Kuje, and Kwali. A multi-stage sampling technique was used for the selection of respondents for the study. In stage one, all the six Local Area Councils were sampled for the study. Stage two involved the random selection of three (3) farming communities on the basis of scale of production from each of the six Area councils to give a total of 18 communities. The third stage involved the selection of 10 crop farmers from each of the 18 communities using simple random sampling technique to make a total of 180 crop farmers as the sampled respondents from a population of 1,146,563 persons.

**Data Collection**

Primary data were collected from the respondents using a structured interview schedule. The instrument contained questions covering all the objectives of the study. Secondary data was also obtained from journals, books, internet to complement the primary data for effective reporting and references.
Analytical Technique

Both descriptive and inferential statistics were used in analysing the data collected. Descriptive statistics such as frequency, percentages and means were used to achieve objective 1, while Logit regression was used to analyse objective 2.

Model Specifications

The logit model is a model developed based on the cumulative logistic probability function. The model assumes that the probability is:

\[ P_i = F(Z_i) = \frac{1}{1 + e^{-Z_i}} = \frac{e^{Z_i}}{e^{Z_i} + 1} \]

\( Z_i = \alpha + \beta x_i \)

\( P_i = 1 \) if the farmer is willing to pay for extension services and 0, for otherwise

\( X_i \) is a vector of explanatory variables

\( \alpha \) = age (years)
\( \beta_2 \) = gender (dummy: 1 = male and 2 = female)
\( \beta_3 \) = size of farm (Ha)
\( \beta_4 \) = level of education (years)
\( \beta_5 \) = frequency of public extension services (Number)
\( \beta_6 \) = years of experience in farming (Number of years)
\( \beta_7 \) = average income from farm production (Naira)
\( \beta_8 \) = household size (Number)

RESULTS AND DISCUSSIONS

Socioeconomic Characteristics of Respondents

Age Distribution of Respondents

The age distribution of respondents in the study Area is presented in Table 1. The result of the analysis revealed that 38.3% of the respondents were between the ages of 36 and 45 years while 33.9% were between 26 and 35 years. These two groups put together account for 62.2% of the study population. The oldest age group of respondents above 55 years accounted for 7.8% of the population. This age distribution implies that the population is young and energetic and can be receptive of agricultural advisory services and also that the population is a productive one. The mean age of respondents in the study was 39 years. This age is a relatively young age relative to the average age in several other studies in Nigeria including Yusuf et al. (2016) who reported an average farmers’ age of 46 years. Oyewole et al. (2015) also reported 46 years, while Oladeebo and Oladeebo (2008) reported an average age of 47 years for farmers in Nigeria.

The result infers that the farming population is young. A young farming population is more risk-prone and innovative and can find paying for private extension very beneficial as they will understand, fully, the needs for extension and wish to invest more than a less educated demography (Akwiwu et al., 2005).

Annual Income of Respondents

As also contained in Table 1, the study population was observed to be a relatively financially stable one with a mean annual income of N504,811.1. This means that they had the wherewithal to pay for agricultural extension as well as purchase other innovative products and services and incorporate them into their agricultural production system. However, half (50%) of the respondents earned an annual income between N1,000 and N250,000. Respondents earning N250,001 – N500,000 accounted for 31.7% of the respondents.

The result also revealed that respondents with high income were small among the population. Income inequality among rural crop farmers has been reported by Osinubu (2003) and Penda and Asogwa (2011). Todaro and Smith (2009) opined that ultimately unequal distribution of personal income in most developing countries and in the rural areas where there is the predominance of crop farming-related incomes is caused by the unequal and highly concentrated patterns of asset ownership, that is land and wealth, in these countries. In rural areas and especially among crop farmers, income is determined by land ownership and size of capital. The result is in line with the position of Todaro and Smith (2009) that extreme income inequality can lead to economic inefficiency. In this type of situation only a few of the crop farmers can efficiently determine the viability of the rural economy by their financial power. Therefore, only the high-income earners will be able to easily pay for extension and key into innovations quickly.

Respondents’ Household sizes

The household size of a particular farmer can influence the farmer’s willingness to pay for extension services. Household size of farmers is presented in Table 1. Most (49.4%) farmers had 6 – 10 persons in their households. For households with 1 – 5 persons about 33.3% of the respondents fell into this category and for households with 11 persons and over on 17.7% of the respondents were in the category. Nevertheless, the average household size in the area was observed to be relatively high, an average of 8 persons per household.

Household size influences willingness to pay for private extension in that larger household sizes may lead to lower willingness levels to pay for private extension as the needs and requirements of individuals in the household may override the need to pay for private extension (Manjur et al., 2013). Furthermore, studies including Omonona et al. (2000); Ike and Oboh (2009) have advanced that large household size is positively correlated with poverty, this means that a large household will not have the money to pay for private extension as it is likely to be poor.
Respondents’ distribution based on sex

From the result presented in Table 1 further shows that majority of the respondents were male (79.4%) while only 20.6% of the respondents were female. This result indicated that the males dominated the females. Ayoola and Odiaka (2004) have submitted that gender is a socio-economic parameter that is useful in analysing the roles, responsibilities, opportunities and constraints of both men and women along different ethnic, religion and ecological lines.

Respondents’ Farm size

Disaggregation of respondents’ farm size is presented in Table 1. The results from the table revealed that majority (71.7%) of the farmers had 1 – 5ha of farm land. Another 15.6% of the respondents had farm sizes of 6 – 10 hectares. Smallholder farmers in Nigeria account for production of up to 80% of the local food productivity in the country (Mgbenka et al., 2015). Most farmers in Nigeria cultivate fields of about 1 hectare. Therefore, it is no surprise that majority of farmers in the study had very small farm areas. In Nigeria smallholder farmers are farmers with land holdings of between 0.1 and 4.99 hectares, however, the standard international measure for categorization of farmers as smallholders is 10 hectares (Mgbenka et al., 2015). The mean size of landholdings in this study was higher than those observed in previous studies such as Ike and Uzokwe (2015) who reported less than 1 hectare. Adikwu (2013) found a high relationship between agricultural land-use intensity and family size.

Farming Experience of Respondents

Farming experience of respondents is presented in Table 1. The result reveals that most (34.4%) farmers had farming experience of between 1 – 10 years. Another 34.4% had farming experience within the range of 11 – 20 years. Farmers who had farming experience of 21 years and over were 31.2% of the population. This shows a nearly even distribution of farmers across the three (3) experience categories. This infers that there are nearly as much new farmers as there are old ones. Farming experience of farmers can influence their willingness to pay for extension services. Typically, farmers with moderate experience may have greater realization of the need for extension but also with so much experience farmers may feel that there is nothing new to learn. More so, more experience may mean greater income acquired over time to be able to afford paying for advisory services.

Level of Education of Respondents

The formal education statuses of respondents are captured in Table 1 and this indicated that the population is well-educated. From the result, 45% of the respondents had tertiary education; NCE holders were 10%, Diploma holders were 14.4% and respondents who had a degree or higher were 20.6% of the study population. The least category was those with no form of formal education (9.4%). Respondents with primary education represented 23.9% of the population while those with secondary education were 21.7%.

The level of education of a farmer has been shown to have a strong correlation with the farmer’s willingness to pay for extension. The level of farmers’ innovativeness is also increased relative to level of formal education. Studies including Ballara, (1991), Ezeibe (2011) and Okoronkwo et al. (2009) have reported positive correlation between education level and increased productivity, and increased productivity has direct bearing with incorporation of new technology and receptiveness of agricultural advisory services. Nigeria National Gender Policy (NNGP) (2006) advanced that education improves the individual’s quality of life and offers him/her access to employment, income and political power.

Number of Extension visits for Respondents

Extension visits received by respondents as documented in Table 1 explained that 23.3% of the respondents received no extension visits per annum. Only 30% of the respondents received 1 – 5 extension visits per annum while 10.6% of the respondents received 6 – 10 extension visits per annum. It was observed that private extension agents offered more visits than public extension agents. Aderinto et al. (2017) reported low level of access and effectiveness of the public extension system as compared to the private one.

Cooperative Membership Status

The membership statuses of respondents as reflected on Table 1 indicates that majority of the respondents (70%) were members of one cooperative organization or another. The rest 30%, however, had no membership of cooperatives. Furthermore, all the respondents who received significant extension advice and considerable extension visits were organized into active cooperatives.

Cooperative membership is a criterion for various interventions in Nigeria as farmers in cooperative arrangement have a number of advantages over individual farmers. These advantages include the fact that farmers in cooperatives are more organized to receive information and invest more intelligently and in the right direction. Respondents in the study benefitting from private extension were those organized into viable and active groups and cooperatives. This infers that membership of cooperatives comes with the advantage of gaining extra beneficial services including agricultural advisory services. Payne et al. (2009) found that farmers who regularly attended deer focus farm field days made more changes than those that only read the newsletter (4.6 compared to 2 changes per farmer).
<table>
<thead>
<tr>
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<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
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<td>26–35</td>
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<td>46–55</td>
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<td>Tertiary</td>
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<td>6 – 10</td>
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<td><strong>Membership of cooperatives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>126</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>54</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Access to credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>55</td>
<td>30.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No access</td>
<td>125</td>
<td>69.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sources of credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No access</td>
<td>125</td>
<td>69.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal sources</td>
<td>8</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal sources</td>
<td>47</td>
<td>26.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field survey, 2018

**Access to Credit**

Respondents’ access to credits is captured in Table 1. The result reveals that majority (69.4%) of the respondents had no access to credits while 30.6% had access. Generally, access to credits for agriculture is very low in Nigeria as the sector is categorized as a high-risk sector. CBN (2008) reported that only 2% of formal loans were available to agriculture in Nigeria. Financial access is an especially important factor for agricultural production.
Sources of credit to Respondents

Only 30.6% of the respondents received credits from both formal and informal sources combined. Most (69.4%) of the respondents did not receive any credits. Informal credits were received by 26.2% of the respondents while only 4.4% of the respondents received formal credits. As could be seen from the low percentage of beneficiaries of credit, possibly most of the respondents may not be aware as to the existence of credit facilities and their sources or they might not have the collateral to pledge. On the other hand, it may be due to the fact that the conditions that may be required to access credit might be too cumbersome or the cost of capital required might be out of their affordability, and hence low or no patronage.

Cost of Extension per visit

The cost of extension paid by respondents per visit is presented in Table 1. Because private extension (paid advisory services) is still a relatively new development in the agricultural sector in Nigeria, there is no fixed or standard rate for extension visits yet. However, the mean payment observed from the study was 3,010 naira per visit. The maximum payment recorded was 70,000 naira while the minimum was 1,200 naira. Some respondents also indicated in-kind payments. Respondents also indicated the fact that payments could be based on the kind of service offered. This means that more complex advisory services would cost more.

Crop Farmers’ Socioeconomic Attributes that Influence their willingness to pay for private extensions

The socioeconomic characteristics of farmers that influence their willingness to pay for private extension are presented in Table 2. The result on the Table reveals that the R-squared is 68.6%. This means that 68.6% of the variation in the output of the regression analysis was determined by the independent variables included in the model. From the result, age (t = 3.167) was significant at 10% while income (t = 5.549) and membership of cooperatives (t = 3.962) were both significant at 5% respectively. This result means that the age of the respondent can determine whether the respondent will be willing to pay for extension or not. It is assumed that the younger the respondent the greater his/her willingness to pay for private extension. This is because young persons are assumed to be innovative and full of vigour and therefore may be interested to innovate at all times. Also, since they are assumed to be full of energy, they may be very interested in adopting new opportunities that will lead to greater prosperity. More so, the income of respondents determined the willingness of the respondent to pay for private extension, meaning that more financially stable the respondent, the more likely for them to pay for private extension and this may help them in improving their efficiency and productivity leading to sustainable business development and growth.

However, frequency of extension visits (t = 11.54) was significant at 1% (with a coefficient of 0.5). This means that for every 1 unit increase in the number of extension visits, crop farmers' willingness to pay for hired extension will rise by 0.5 at a confidence level of 99%. Furthermore, the result revealed that gender, farming experience; years of formal education, farm size and household size were not significant factors influencing crop farmers’ willingness to pay for private extension in the area. This means that the gender of a crop farmer, his/her farming experience, years of formal education, farming size or household size had no effect whatsoever on whether they were willing to pay for private extension or not.

### Table 2: Socioeconomic determinants of crop farmers’ willingness-to-pay for private extension

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Std. Error</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.060</td>
<td>.034</td>
<td>3.167</td>
<td>1</td>
<td>.075*</td>
<td>.942</td>
</tr>
<tr>
<td>Gender</td>
<td>.943</td>
<td>.880</td>
<td>1.148</td>
<td>1</td>
<td>.284</td>
<td>2.567</td>
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<tr>
<td>Farming experience</td>
<td>.027</td>
<td>.036</td>
<td>.540</td>
<td>1</td>
<td>.463</td>
<td>1.027</td>
</tr>
<tr>
<td>Years of formal education</td>
<td>.074</td>
<td>.065</td>
<td>1.322</td>
<td>1</td>
<td>.250</td>
<td>1.077</td>
</tr>
<tr>
<td>Farm size</td>
<td>.010</td>
<td>.045</td>
<td>.047</td>
<td>1</td>
<td>.828</td>
<td>1.010</td>
</tr>
<tr>
<td>Household size</td>
<td>.061</td>
<td>.053</td>
<td>1.324</td>
<td>1</td>
<td>.250</td>
<td>1.063</td>
</tr>
<tr>
<td>Income</td>
<td>.000</td>
<td>.000</td>
<td>5.549</td>
<td>1</td>
<td>.018**</td>
<td>1.000</td>
</tr>
<tr>
<td>Number of Extension visits</td>
<td>.500</td>
<td>.147</td>
<td>11.544</td>
<td>1</td>
<td>.001***</td>
<td>1.649</td>
</tr>
<tr>
<td>Cooperative membership</td>
<td>-1.131</td>
<td>.568</td>
<td>3.962</td>
<td>1</td>
<td>.047**</td>
<td>.323</td>
</tr>
<tr>
<td>Constant</td>
<td>.986</td>
<td>2.136</td>
<td>.213</td>
<td>1</td>
<td>.644</td>
<td>2.681</td>
</tr>
</tbody>
</table>

R² = 68.6%

*** – significant at 1%
** – significant at 5%
* – significant at 10%

Source: Field survey, 2018
CONCLUSION AND RECOMMENDATIONS

Conclusion

From the result of the study, it can be concluded that while private extension is still in its development stages, the determinants of crop farmers’ willingness to pay for private extension services were age, income, membership of cooperatives and frequency of extension visits.

Recommendations

1. The study shows that the willingness to pay for private extension is most influenced by the number of extension visits received by respondents, this is a justification that there should be greater investment in private extension by the government in a public-private partnership arrangement since the private extension system has shown efficacy, it can be developed to engage with smallholder farmers while the government shares in the coordination of the service centres and cost-sharing.

2. There should be deliberate policies that will draw more young farmers into Nigeria’s agricultural ecosystem as the study reveals that willingness to pay for private extension increases within the younger generation of farmers. Younger farmers have the innovativeness to incorporate vital innovations and modern technologies precipitated from research and delivered through extension.

3. From the study, income and cooperative membership proved to be two socio-institutional factors influencing willingness to pay for private extension therefore the capacity of the Nigerian farmer must be developed to increase productivity as well as organize themselves into viable and proactive cooperatives that will improve their overall performance and boost their knowledge and skill sets built through proper extension services delivery.

4. A completely free extension service provision will prove to be ineffectual and unrealistic. In the light of commercialization of agriculture to bring revenue for the diversification of our economy from a monolithic oil-run economy, there is need for farmers, private sector actors and government to reach a payment alternative where all actors will engage in payment and benefits or losses will be shared by all. This study has shown that farmers as stakeholders are indeed willing.

5. In designing viable private extension system, we must design an extension that is result-oriented and strictly targeting to solve perceived and expressed problems of the smallholder farmers in Nigeria; as the study has shown, respondents will purchase only the services they require the most at any given time.

6. In the development of policy for accelerated extension services in the country, a holistic, participatory and all-inclusive approach be adopted so as to ensure that the interest and views of all interest groups are considered and this will ensure ownership.

AUTHORS’ DECLARATION

We declare that this study is original research by our research team. All authors contributed and there is no conflicting interest.

REFERENCES


Determinants of Willingness to Pay for Private Extension Services by Crop Farmers in the Federal Capital Territory (FCT) Abuja, Nigeria


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