World Journal of Agricultural Sciences 6 (1): 13-17, 2010
ISSN 1817-3047

Economic Evaluation of Prospective Participatory Financing of Agricultural Extension Services Delivery in Ekiti State, Nigeria

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Abstract: This study identifies and evaluates factors influencing the willingness to participate financially in agricultural extension services delivery in Ekiti-State, Nigeria. A total of 120 respondents who were smallholders were interviewed with the aid of a pre-tested structured questionnaire. Data were collected on socio-economic characteristics of the respondents. The data obtained were analyzed using descriptive statistics and the Probit regression model. Result of the Probit model estimates showed that; off farm income ($p<0.05$) and schooling years ($p<0.10$) positively influence willingness to participate financially in agricultural extension services delivery, while, age ($p<0.05$) and household size ($p<0.05$), negatively influence willingness to participate financially in agricultural extension services delivery. The result confirms the potential and prospect of public funded extension services with contributions from farmers which can be delivered in a private way as viable effective agricultural information dissemination option in the study area.

Key words: Willingness to participate · Smallholders · Agricultural information · Probit · Ekiti-State

INTRODUCTION

Agricultural development remains strategic to sustainable economic growth, poverty alleviation and a pre-requisite for food security in developing countries. Akpabio [1] stated that agriculture is the single largest contributor to the well-being of rural poor in Nigeria. The sector contributes about 41% of the Gross Domestic Product (GDP), 88% of non oil foreign exchange earnings, employs about 70% of active labour force and provides raw materials for the agro industrial sector [2]. It has been stated that the productivity condition in agricultural sector is directly linked to the development capacity in both urban and rural non agricultural sector [3]. Other studies have equally confirmed the strength of growth linkages or multipliers between agriculture and the wider economy. In Kenya the multiplier from agricultural growth are three times as large as those for non agricultural growth [4]. Delgado *et al*. [5] shows that every additional $1 of farm income leads to a further income of between $0.96 in Niger and $1.88 in Burkina-Faso, while Hazel, P. and Hojjati, B. [6] stated that the same increment of $1 in farm income creates a further $1.50 income outside agriculture in Zambia. Therefore, for rapid economic progress and rural poor welfare there must be a sustainable agricultural transformation most especially in developing economies.

Information dissemination is very vital to agricultural transformation. According to Spore, [7] farmers that are well informed are able to perform better in their production than those that are not so well informed. Generally, farmers need information on market prices, improved planting materials, credit facilities and other competitors. Therefore, for a desirable transformation in agricultural sector, farmers must have access to appropriate research based modern technologies. Meanwhile, Akinyemiju, O.A. [8] stated that there are massive on shelf adaptable research results waiting to used to transform agriculture in Nigeria. Adoption of such technologies is predicated upon systematic information dissemination by building capacity and through training programmes for farmers. Therefore, expansion of extension efforts is necessary to help farmers learn about new production practices and economic resources use.

In Nigeria, the responsibility of providing agricultural extension services to farmers is usually coordinated by government [9]. This has always represented heavy fiscal burden on government as evidence by the persistent inefficiencies of such programmes in the recent time. Specifically, Onu, D.O. [10] stated that the performance of

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Nigeria's rural development and public extension agencies have not been particularly satisfactory. The observed inefficiencies and unsatisfactory performances of public extension services is explained in two ways; one, Swanson *et al*. [11] noted that the reduction of national governments and international donors in public institution investment including extension programmes led to the deterioration of extension services delivery in most developing countries including Nigeria as observed by Apantaku *et al*. [9]. Chapman and Tripp[12] and McFeeters[13] stated that experiences in a number of locations around the world are demonstrating that inefficiencies in resources allocation are unavoidable if a service such as extension is provided free of charge to stakeholders who might be able or willing to contribute in order to obtain appropriate services.

The inefficiencies in extension services delivery invariably increased farmers problem and they are prompted to request for provision of extension services which can be more responsive to their need. Hence the objective of this study is to quantitatively evaluate and analyze farmers' willingness to participate financially in agricultural extension services delivery in Ekiti State, Nigeria.

Theoretical Framework: The product delivered by extension services is information about new technologies such information variables account for extension activities conducted during the introduction of a new technology. To evaluate the farmers' willingness to participate financially for such information, the required information is treated as an agricultural input that extension officers provide for farmers. According to the consumer theory, demand functions are derived by considering a model of preference maximizing behaviour couple with underlying economic constraints. The consumers can then choose a good that satisfies better his needs or expectations or that provide him with a higher utility under normal circumstances. However, the consumer cannot choose a good that he cannot afford because his demand is subject to his budget constraint. Willingness to participate financially in agricultural extension services delivery study in Nigeria in general and Ekiti State in particular may mark the beginning of agricultural extension services that can be publicly funded with additional contributions from farmers which will be delivered in a private way. The rationale behind willingness to participate financially studies is that it indicates the value that individuals attach to a good or service which in turn predicts their likely contribution to its maintenance [14]. Such contribution from farmers would enhance accountability of extension officers to farmers and increase incentives for extension delivery [15]. Equally, determination of factors influencing willingness to participate financially in a given service will provide further understanding of contributions towards the participatory approach to solving developmental problems.

MATERIALS AND METHODS

The Study Area: The study was conducted in Ekiti State a largely homogenous state which lies within the tropic in the rain forest and savannah region of south western part of Nigeria. It is located between longitudes 4° 45' and 5°45 'East of Greenwich meridian and latitude 7°15' and 8°5' North of equator [16]. The state enjoys a typical tropical climate with two distinct seasons, the raining season which last roughly from April to October and the dry season which prevail for the remaining months. Ekiti State is basically an agrarian state. Majority of the inhabitants are essentially small holder farmers who depend largely on agriculture for their livelihood. They produce both food and cash crops while the women are predominantly traders but equally engaged mostly in food crop production. Agricultural operations are still largely traditional therefore productivity is low.

Sampling Technique: A total of 120 respondents were selected through a multistage random sampling process. The state was divided into two agroclimatological zones, the rain forest in the southern part and the derived savannah region in northern part. Four Local Government Areas (LGA)s were selected from each of the zones. This is followed by selection of three villages from each LGA. The last stage involves the selection of five farmers from each village. Data were collected on farmers' willingness to pay for agricultural extension services delivery, socioeconomic characteristics of respondents such as age, farming experience, schooling years, gender, household size, farm size and off farm income using a pre tested structured questionnaire.

Data Analysis: The tools employed in the analysis of data obtained include descriptive statistics such as, frequencies, mean, percentages and standard deviation to describe, summarize and analyze the socio-economic characteristic of the respondents. Probit regression model was used to assess the probability relationship between the farmers' willingness to pay for agricultural extension services delivery and the socio economic characteristics.

Table 1: Description and measurement of the study variable

Variable	Description	Measurement
X_1	Farmer's Age	Years
X_2	Gender of farmer	Dichotomous: male, 1: female, 0
X_3	Schooling years	Years
X_4	Farming experience	Years
X_5	Household size	Number of people under the farmers roof
X_6	Farm size	Hectare
X_7	Off farm income	N/month

The Probit regression model used is specified as follows;

$$Pr(Y_i=1) = f(\beta_i X_i) + e_i$$

Where;
Y is a dichotomous dependent variable which can assume the value of 0 or 1. it measured the farmers willingness to participate financially in agricultural extension services delivery, Yes = 1 ; No = 0
X_i = n x k matrix of explanatory/independent variables
β_i = k x 1 vector of parameters /coefficients to be estimated
e_i = error term

Table 1 below shows the description and measurement of the explanatory variable.

RESULTS AND DISCUSSION

Socioeconomic Characteristic of the Respondents: The socioeconomic characteristic of the households considered in this study include age, gender, household size, schooling years, farming experience, farm size and off farm income.

The distribution of the farmers by age is indicated in Table 2. Majority of the farmers, 70, representing 58.34 per cent of the sampled farmers' falls into the age group of between 40 and 59 years, this age bracket is often referred to as the active working group. A higher proportion, 41 representing 34.17 per cent is however between the age group of between 40 and 49 years, while 29 farmers representing 24.17 per cent fall between 50 and 59 years age group. The average age of the sampled farmers is 47.06 years. A total of 32 farmers representing 26.67 per cent fall below the age groups of between 40 and 59 years while, 18 farmers, representing 15 per cent fall into age groups above of between 40 and 59 years. This distribution shows that more than half of the sampled farmers are in there active age range.

Gender distribution of the respondents shows that 79 farmers representing 65.83 per cent of the sampled

Table 2: Socioeconomic Distribution of Respondents

Variable	Frequency	Percentage	Mean	StandardDeviation
Age (years)				
<30	8	6.67		
30-39	24	20.00		
40-49	41	34.17	47.06	10.20
50-59	29	24.17		
60-69	15	12.50		
>69	3	2.50		
Gender				
Male	79	65.83		
Female	41	34.17		
Schooling Years				
0-3	18	15.00		
4-7	43	35.83	7.53	5.58
8-11	39	32.50		
12-15	20	16.67		
Farming Experience (years)				
1-10	62	51.67		
11-20	37	30.83	12.89	7.36
21-30	16	13.33		
31-40	5	4.17		
Household Size				
<3	8	6.67		
3-6	51	42.50		
7-10	37	30.83	7.56	3.02
11-14	18	15.00		
>14	6	5.00		
Farm Size (Ha)				
0.1-0.5	19	15.83		
0.6-1.0	41	34.17		
1.1-1.5	33	27.50	1.15	0.81
1.6-2.0	16	13.33		
>2.0	11	9.17		
Off Farm Income (N/month)				
≤1000	8	6.67		
1100-2000	34	28.33		
2100-3000	32	26.67	2819.67	1821.33
3100-4000	19	15.83		
4100-5000	15	12.50		
>5000	12	10.00		

Source: Field Survey, 2007

Table 3: Estimates of the Probit Regression Model

Variable	Coefficients	Standard Deviation
Age	-0.2916*	0.0972
Gender	0.3281	0.1171
Schooling years	0.0392**	0.0815
Farming Experience	-0.5108	0.1459
Household Size	-0.1359*	0.0611
Farm Size	0.1430	0.1392
Off Farm Income	0.0541*	0.2075
Constant	1.6085	

* Significant at 5 per cent
* Significant at 10 per cent
Sources: Data Analysis, 2008

farmers were male while 41 farmers representing 34.17 per cent were females. This distribution shows that males are more involved in farming activities than females in the study area.

The average schooling years among the sampled farmers is 7.53 years, showing that majority of the respondents did not attain senior secondary school certificate level or equivalent. However, a sizable proportion, 39 respondents representing 32.50% spent between 8 and 11 years in school. A total of 20 respondents representing 16.67 per cent spent between 12 and 15 years in school, show that the have tertiary education. Majority of the respondents have between 0 and 7 years schooling years indicating that this group does not have more than primary education. The distribution shows a low education level among the sampled farmers. Distribution of respondents by farming experience indicated that 62 respondents representing 51.67 per cent have between 1 and 10 years of farming experience, while 37 farmers representing 30.83 per cent have between 11 and 20 years of farming experience. The remaining 21 farmers representing 17.5 per cent have between 21 and 40 years of farming experience. The average farming experience is 12.89 years.

The sampled farmers have an average household size of 7.56. The distribution shows that 51 farmers representing 42.50 per cent have house size of between 3and 6 while 37 farmers representing 30.83 per cent fall within household size of between 7 and 10. A total of 8 farmers representing 6.67 per cent have household size of less than 3 while 6 farmers representing 5 per cent have household size of greater than 14. This distribution generally shows that the sampled farmers have a fairly large household sizes. None of the farmers cultivated less than 0.1 hectares of land, while 19farmers representing 15.83 per cent cultivated between 0.1 and 0.5 hectares. About 41 farmers representing 34.17 per cent cultivated between 0.6 and 1.0 hectares, 33 farmers representing 27.50 per cent cultivated between 1.1 and 1.5 hectares. A total of 16 farmers representing 13.33 per cent cultivated between 1.6 and 2.0 hectares, while 11 farmers representing 9.17 per cent cultivated above 2 hectares of farmland. The average farm size distribution is 1.15 hectares showing that the farmers are smallholders. The average off farm income of the sampled farmers is N2816.67. Only 8 farmers representing 6.67per cent earn less than N1000.00 off farm income per month, while12 farmers representing 10 per cent earn above N5000.00 off farm income per month. A sizable proportion, 34 farmers representing 28.33 per cent earn between N1100.00 and N2000.00 off farm income monthly, also, 32 farmers representing 26.67 per cent earn between N2100.00 and N3000.00 off farm income monthly.

Factors Influencing Farmers Willingness to Participate Financially in Agricultural Extension Service Delivery: The result of Probit regression model used in assessing the probability relationship between the farmers' willingness to participate financially in agricultural extension services delivery and their socio economic variables is presented in Table3 below. From the Table, it shows that four out of the seven coefficients of the explanatory variable are significant indicating that any change in these variables will substantially influence the willingness to participate financially among the farmers. The coefficient of age, household size and off farm income are all significant at 5 per cent level while schooling years is significant at 10 per cent level. Gender, Schooling years, farm size and off farm income shows positive relationship with the farmers willingness of financial participation. This implies that any increase in any of these variables will increase the probability or willingness of financial participation among the farmers. As for gender variable, it shows that men has a better probability of financial participation, this is generally expected since men usually have more access to production resources than women in most cases. Equally with additional off farm income, it is expected that more capital will be available for farmers to invest in their farm business. Also educated farmers do appreciate the value of information and are thus willing to acquire information that will help their business to grow regardless of the cost.

Age, farming experience and household size show negative relationships with the farmers' willingness to participate financially. The negative relationship implies that an increment in any of these variables will reduce the probability or willingness to participate financially among the studied farmers.

For age, it means that younger farmers are more willing to participate financially in agricultural extension services delivery more than older farmers who may not appreciate to a greater extent any new information. Equally, farmers with larger household size may find it difficult to participate financially than the ones with lower household size probably because of some more pressing domestic demands.

SUMMARY AND CONCLUSION

This study examines the probability relationship between willingness of farmers to participate financially in agricultural extension services delivery and their

socioeconomic characteristics using probit regression model. From the results, it shows that although there was extension service delivery currently available to the farmers, all their information needs were not met and also not all the farmers were reached. This confirmed the ineffectiveness and inefficiency of the present mode of extension services delivery in the study area. The Probit model estimates result showed that; male gender, off farm income, farm size and schooling years positively influence willingness to pay, while, age, household size and farming experience negatively influence willingness to participate financially. The result confirms the potential and prospect of public funded extension services with contributions from farmers which can be delivered in a private way as a viable effective agricultural information dissemination option in the presence of persistence decline in the government funding of public extension programs. This revelation is very important to extension policy makers, because they can now package agricultural information as an agricultural input with the hope of patronage from the farmers bearing in mind their characteristics as the basis for potential customer identification. However, there is need for further study to investigate how much the farmers will be willing to pay and what is the specific information gap needed to be filled.

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