

Full Length Research

Socio-Economic Factors influencing the use of Productivity Enhancing Technologies among Farmers in Kaduna State

¹Ojeleye, O. A., ¹Abdulsalam, Z. and ²Oyewole, S. O.*

¹Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria

²Savanna Forestry Research Station, Samaru-Zaria. Corresponding author's email: shola4delord@yahoo.com

Accepted 6 August 2014

This study examined socio-economic factors influencing the use of productivity enhancing technologies among farmers in Kaduna State. Data were obtained from 60 farmers with the aid of structured questionnaire. Data were analysed using descriptive statistics and multiple regression analysis. The results showed that 76.5% of the respondents have household size ranging between 6-15 persons. The mean age of respondents was 41.983. It was revealed that 82.4% of the respondents have farming experience of more than 10 years. About 32.9%, 11.7% and 4.1% had primary, secondary and post secondary education respectively. The use of pesticides and herbicides among farmers is accounted for by 80% of the respondents. It is noted that 76.7% and 81.7% of the farmers are aware and have adopted the use of improved seeds and animal traction respectively. The results further revealed that membership of association and extension contact were positively and significantly influential to the use of productivity enhancing practices. It was recommended that farmers are encouraged to come together and form farmers associations which will promote their vocation providing a favourable climate for contact and the gaining of experience from the competent and experienced members.

Keywords: Productivity, Technologies, Farmers, Kaduna State

INTRODUCTION

Agriculture remains the backbone of the Nigeria economy since independence, employing more than 70 percent of the country's population. Small farmers dominate the sector and provide the bulk of the nation's domestic food supply (FAO, 2003). Nigerian agriculture is characterized by small holders farming. About 90% of total agricultural

output is generated by household, which on average cultivate about 2 hectares of land (Government of the FRN, 2006), with the hand hoe traditional agriculture, low usage of agricultural inputs like the fertilizers, herbicides, pesticides, improved seeds, credit facilities, are prevalent. The resultant effect of this has made

agriculture to remain under developed in the country, as productivity per hectares is low and so the farmers have remained poor. According to Yemisi *et al.* (2009) a large majority of farmers operate at subsistence, smallholder level, with intensive agriculture being uncommon. In Nigeria, one of the constraints to achieving agricultural growth, development and food security is the lack of appropriate technology available to Nigeria peasants.

Generally, the Nigerian agricultural industry's poor performance despite various efforts made by government in increasing food production has been blamed on poor allocation and management of resources, low level of technology, inadequate capital, poor economic infrastructure and lack of adequate incentives amongst others (Sanni, 1991). Chief amongst these challenges is the issue of low level of uptake of technologies, which has been observed by Mudahar (1974) to be responsible largely for agricultural sector's low level and poor performance.

As recognized by Doss (2006), one way of improving agricultural productivity, in particular and rural livelihood in general, is through the introduction of improved agricultural technologies to farmers. Doss *et al.* (2003) also opined that adoption of improved technologies is an important means to increase the productivity of small holder agriculture in Africa, thereby fostering economic growth and improved wellbeing for millions of the poor households. Ouma *et al.* (2006) suggested that the use of improved technologies will continue to be a critical input for improved farm productivity.

Agricultural development depends, to a great extent, on the willingness and ability of the small-scale farmers to make use of new technology as developed in research laboratories. New innovations in agricultural development are of little value until they can be put to use for the economic and social well-being of the people involved. This study therefore is an attempt to examine the factors influencing farmers' usage of productivity enhancing technologies and the effect the uptake has made on production and farmers' revenue as a whole.

The study is also designed to identify the current mode of technology use, the effect these technologies and practices have in relation to farmer's socio-economic characteristics as they influence the income level of the farmers.

METHODOLOGY

This study was conducted in Kaduna States of Nigeria. The State lies between latitude 11° 32' and 09° 02' North of the equator and 80° 50' and 06° 15' East of the prime meridian. The mean annual rainfall ranges from 500 mm in its northern fringes to 1600 mm along its southern boundary. Rainfall is unimodal and allows 75–180 days

growing period across the gradient—north to south for the region. Agriculture is the main stay of the economy of Kaduna State with about 80% of the people actively engaged in farming. Cash and food crops that are cultivated and produced include: yam, cotton, groundnut, tobacco, maize, beans, guinea corn, millet, ginger, rice and cassava. Another major occupation of the people is animal rearing and poultry farming.

A stratified two-stage sampling technique was used for this study. The first stage involved random selection of 25% sample frame of the local governments from the State. The Local Government selected area Kachia, Makarfi, Jaba, Ikara, Kubau and Giwa Local governments. The second stage also involved random selection of two villages within the local governments where 5 respondents were sampled per village and ten farmers each per local government given a total of 60 respondents for the study. The respondents were administered questionnaires randomly.

Analytical techniques

The descriptive statistical was used mainly to describe the socio-economic characteristics of the respondents and identify the technologies enhancing productivity used by the farmers. The regression analysis was used to identify factors influencing the use of technologies enhancing productivity. Regression model is specified below:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + e$$

Where,

Y = Productivity enhancing technologies (Number)

X₁ = Age of respondent in years (Years).

X₂ = Household size (Number).

X₃ = Educational status of respondent (years of formal schooling).

X₄ = Contact with extension services scored (Number of contact).

X₅ = Membership of farmer's association (Years).

X₆ = Years of farmers' farming experience (Years).

β₀ = constant term

β₁ - β₆ = coefficients for the respective variables in the regression model

e = error term

RESULTS AND DISCUSSION

The results presented in Table 1 showed that 77.7% of the respondents are in the range of 21-50 years which is the active age range. At this age, they are virile and can

Table 1. Socio-economic characteristics of the farmers in the study area

Variables	Frequency	Percentage
Age		
≤ 20	2	3.3
21-30	8	13.3
31-40	21	35.0
41-50	22	36.7
> 50	7	11.7
Farming experience		
≤ 10	9	15.0
11-20	23	38.3
21-30	14	23.3
31-40	14	23.3
> 40	0	0
Gender		
Male	41	68.3
Female	19	31.7
Marital Status		
Single	5	8.3
Married	52	86.7
Widow	3	5.0
Household size		
≤ 5	3	5.0
6-10	24	40.0
11-15	19	31.7
16-20	12	20.0
> 21	2	3.3
Education		
No Formal Educ.	2	3.3
Quranic education	13	21.7
Adult education	5	8.3
Primary education	24	40.0
Secondary education	11	18.3
Post Sec. Education	5	8.3
Extension Contact		
No Contact	9	15.0
Weekly	20	33.3
Monthly	15	25.0
Bi-Monthly	2	3.3
Quarterly	12	20.0
Once/Twice a year	2	3.3
Total	60	100

do a lot of farm work if given proper incentives. About 22.4% of the samples are the dependent age of less than

20 years and above 50 years. The mean age of respondents was 41.983. It was revealed that 82.4% of

Table 2. Distribution of Respondents According to Productivity Enhancing Practices Adopted

Productivity enhancing practices	Frequency	Percentage
Chemicals Use	48	80.0
Fertilizers Use	54	90.0
Improved Seeds Use	46	76.7
Use of Credit Facilities	3	5.0
Animal Traction	49	81.7
Tractor Facilities	12	20.0
Crop Rotation Practice	36	60.0
Technical Labor Awareness	35	58.3
Technical Labor Patronage	17	48.6
Storage Practice	37	61.7
Crop Processing	11	18.3
Market Accessibility	44	73.3
Total	60	100

the respondents have farming experience of more than 10 years. This represents a sizeable percentage of farmers in the sampled area. It is expected that with increasing years of farming, farmers gain experience in the art of farming to the advantage of gaining understanding and increasing productivity. This also assists to identify the respondents as farmers who have perhaps lived all or most of their lives farming. As shown from Table 1, 76.5% of the respondents have household size ranging between 6-15 people. This seems to be the predominant range of the family sizes. Household size ranging between 16 and above amounted to 20% of the respondents, and this could consequently mean more family labour contributing to the farm family economy. It was found that about 6.5% of the farmers had no education. 35.3% had Quranic education while 9.4% had adult education. About 32.9%, 11.7% and 4.1% had primary, secondary and post secondary education respectively. Education propels farmers to adopt innovations and technologies that are vital for enhancing productivity.

Productivity Enhancing Practices Usage by Farmers in Kaduna and Kano States

The distribution of respondents based on the productivity enhancing practices usage is presented in Table 2. The use of pesticides and herbicides among farmers is accounted for by 80% of the respondents, indicating that a sizeable number of farmers are well exposed to the use of chemicals to enhance production and productivity in agriculture. The use of fertilizer in the states also records

a high percentage of 90% usage among the sampled farmers. This basically shows the level of awareness and use of pesticides, herbicides and fertilizers.

The use of improved seeds and animal traction also received a wide coverage (usage) among the sampled farmers. It is noted that 76.7% and 81.7% of the farmers are aware and have adopted the use of improved seeds and animal traction respectively. The question of whether the seeds are pure breeds is left for further enquiries. As will be presented and discussed later, the question of the sources of these improved seeds is also very important. Also, only 10% of the sampled farmers in the two states had access to credit facilities. The rest 90% who did not gain access to credit facilities gave different reasons which will be presented later.

The use of machineries like the tractor, diesel engines, crushers, threshers, seed drill, are part of the elements of technologies classed "new machines". These modern farm machineries which are mostly tractor mounted essentially substitute human labour on the farm and therefore reduce drudgery, allowing for increased cultivation and consequently increased production. As shown in Table 2 only 20% of the sampled farmers use tractor facilities. The availability and patronage of technical labour, which in essence has to do with labour requirements of say the use of tractor facilities or sophisticated machineries in processing which the farmers can not readily do by themselves, is also related to this. It was observed that 58.3% of farmers agree to the presence of technical know-how personnel though only 48.6% these farmers have access to patronize these technical men in the study area.

Crop rotation is a form of farming system essentially

Table 3. Factors influencing Productivity Enhancing Practices Usage in the study area

Variables	Coefficient	Standard Error	Coefficient
Age of Respondent X_1	-0.0067	0.0648	-0.1033
Household size X_2	-0.0188	0.0752	-0.2500
Level of Education X_3	0.1050	0.0876	1.1986
Extension Contact X_4	0.9895	0.269711	3.668***
Membership of Association X_5	0.3961	0.152931	2.5905**
Farming Experience X_6	0.0397	0.064369	0.6174
Constant a_0	0.4195	0.124009	3.3830***

R Square = 0.18897 F Value = 2.87374*** *** Significant at 1% ** Significant at 5%

undertaken to manage soil fertility, control erosion, weeds and pests. It is a very good agricultural practice which when adopted enhances farmers' productivity. About 60% of farmers are aware of this practice and claimed to have adopted same. Storage of farm produce and processing are two very vital practices that can undoubtedly enhance farmers' productivity and income when they are well managed. Storage is the holding of goods from the time of production until when they are needed while processing entails conversion of a commodity from its raw state to a form more acceptable to the buyers (consumers) or to the next stage in the distribution chain. Storage and processing can be traditional, intermediate or of improved or advance technology, but essentially, they enhance farmers' productivity and income. It was noted that 61.7% of farmers sampled responded to using one form of storage measure or the other in the study area

Socio-economic Factors Influencing the Usage of Productivity Enhancing Practices

The results in Table 3 showed the factors influencing the productivity enhancing practices adopted by the farmers. It was revealed that membership of association and extension contact were positively and significantly influential to the use of productivity enhancing practices. The estimated coefficient obtained for extension contact exacter positive influence on the use of technologies which imply that increase in number of extension contact would increase number of technologies used by the farmers. Nwaru (2001) opined that by ensuring resources are better mobilized and more efficiently used, a vibrant

and functional extension system could be a solution to the problem of acute scarcity of resources in the rural economy which is complicated by inefficiency of use of such resources. Membership of association was found positive and significant at 5%. The implication of this is farmers will use more technologies enhancing technologies as the year of association participation increases. Membership of cooperative organization provides means of interaction among farmers which can enhance innovation diffusion easily among them. According to Idiong *et al.* (2007), membership of cooperatives affords the farmers the opportunities of sharing information on modern rice practices.

CONCLUSION AND RECOMMENDATIONS

Membership of farmers association was found to be significant and positively related to the usage of productivity enhancing practices. In the light of this, farmers are encouraged to come together and form farmers associations which will promote their vocation providing a favourable climate for contact and the gaining of experience from the competent and experienced members and thereby paving way for appropriate decision to accepting new/recommended ideas.

REFERENCES

- Food and Agricultural Organization (2003). Food and Agriculture Organization 2003. FAOSTAT <http://faostat.fao.org/default.htm>
 Idiong IC (2007). Estimation of Farm Level Technical

- Efficiency in Small Scale Swamp Rice Production in Cross Rivers State, Nigeria: A stochastic frontier approach. *World Journal of Agricultural Science* 3(5): 653-658.
- Doss CR (2003). Analyzing technology adoption using micro studies: Limitations, challenges and opportunities for improvement. *Agric. Econ.*, 34: 207-219.
- Ouma JO, De Groot H, Owuor G (2006). Determinants of improved maize seed and fertilizer use in Kenya: Policy implication. Presented at the International Association of Agricultural Economists' Conference, Gold Coast, Australia, August. pp. 12-18.
- Nwaru JC (2001). Stimulating Entrepreneurship in Nigerian Farms through Sustainable Agricultural Extension System. *Privatization and Commercialization of Agricultural Extension Services Delivery in Nigeria: Prospects and Problems*, Olowu T.A. (ed),
- Proceedings of the 7th Annual Conference of the Agricultural Extension Society of Nigeria, 19th – 22nd August, Pp 19– 27.
- Sanni SA (1991). Technological Change in Crop Production Among Small-Holder Framers: A Case Study of Fasakari LGA of Katsina State. An Unpublished M.Sc. Thesis Submitted to the Department of Agricultural Economics and Rural Sociology, ABU, Zaria.
- Mudahar MS (1974). "Dynamic Analysis of Direct and Indirect Implications of Technical Change in Agriculture: A Case Study of Punjab, India" Occasional Paper No 7 Department of Agricultural Economics, Cornell University.
- Federal Ministry of Agriculture and Natural Resources (1997). *Nigeria Agricultural Statistics*. FMANR, Abuja. 2nd edition.
- Yemisi I. Ogunlela and Aisha A. Mukhtar, 2009. Gender Issues in Agriculture and Rural Development in Nigeria: The Role of Women. *Humanity & Social Sciences Journal* 4 (1): 19-30.