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Influence of Productivity Enhancing Farm Practices on Farmers Income in the Nigerian Sudan Savanna

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Abstract

This study investigates the productivity enhancing farm practices effect on farmers' income in the Sudan savanna belt of the northern part of Nigeria. Data were obtained from 110 farmers by use of structured questionnaire. Data were analyzed using descriptive statistics and multiple regression. The result shows the average age of farmers in the study area to be 40.6 years as the average household size was found to be 10.2 ranging between 3-28 people. About 51% of the farmers are not learned in English language while also, over 50% have between weekly to monthly contact with extension services. The productivity enhancing farm practices like usage of chemicals, fertilizers, improved seeds, credit facilities, animal traction, tractor facilities, crop rotation practice, technical labor, storage practice and crop processing were assessed. The influence of these farm practices was found to be positive and significantly related to the farmers' income. Recommendations were made for farmers to adopt these practices and for improvement in extension linkages to sensitize small-scale farmers on the need for the adoption of improved farm practices.

Keywords: Productivity enhancing farm practices, farmers income, Sudan savanna, Nigeria.

Introduction

Nigeria is agrarian, and agriculture remains the hub of the economy, providing employment for over 90 percent of the rural dwellers, who constitute about 70 percent of the total population[1]. Nigeria's total land area is 92.4 million hectares, and out of this, 91 million hectares is adjudged to be suitable for cultivation[2]. The country also has about 1.3 million hectares of water bodies as the agricultural land area is classified as 28.2 million hectares arable, 2 million hectares fadama (irrigable land), 2.5 million hectares permanent crops, 10.9 hectares forest/wood, and 40 million hectares pasture[1]. Approximately half of this cultivable land is effectively under permanent and arable crops, while the rest is covered by forest wood land, permanent pastures and built up areas[2].

Nigerian agriculture is however characterized by small holders farming. About 90% of total agricultural output is generated by households, which on average cultivate about 2 hectares of land[3]. These farmers are illiterates and their mode of cultivation is rudimentary. 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[4]. These problems have led the government to embark on policies which are capable of developing the agricultural sector in the country which essentially introduce to farmers, productivity enhancing farm practices.

For farmers to adopt an improved agricultural farm practice, they pass through many stages such as awareness, interest, trial, evaluation and adoption. 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. Transformation of traditional farming system for increased food production calls for adoption of these improved farm practices. 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. Suffice to say is that not enough studies have been carried out to ascertain usage of most of these productivity enhancing practices and the influence of usage on production and farmers' economy.

This study therefore attempts to identify the improved farm practices usage by farmers in the study area and the level of impact they have on the farmers' income.

Material and Methods

This study was conducted in Nigeria's Kano state. Kano State is a state located in North-Western part of Nigeria and the most populous state of the Nigerian Federation. Created on May 27, 1967 from part of the Northern Region, Kano state borders Katsina state to the north-west, Jigawastate to the north-east, Bauchi State to the south-east and Kaduna State to the south-west. The capital of Kano state is Kano and it is located on 12°00′N 8°31′E. There are 44 local government areas in the state and the state, also known as the center of commerce, produces groundnuts as one of its chief

legume crops, and is also rich with solid mineral resources. Kano is known today as the most irrigated state in the country with more than 3 million hectares of cultivable land.

A two level multistage random sampling method was use for this study. The first stage involved random selection of 25% sample frame of the local governments from the state, that is, 11local government areas in Kano state. 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. The respondents were administered questionnaires randomly. Altogether, 110 farmers were sampled. The local governments randomly selected in the state include: Gwarzo, Tofa, Sumaila, Wudil, Wurawa, Ungogo, Garko, Gaya, Shanono, Tarauni and Rogo local governments.

The descriptive statistical tool was used mainly to describe the socio-economic characteristics of the respondents and identify the productivity enhancing farm practices used by the farmers. The regression analysis was used to determine the effect of productivity enhancing farm practices. Regression model is specified below:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 \beta_7 X_7 + e$$

Where,
Y = Farmer's total revenue in naira, X_1 = Total land area in hectares, X_2 = Total cost of labour in naira, X_3 = Total cost of improved seed in naira, X_4 = Total cost of fertilizer in naira, X_5 = Total cost of chemicals in naira, X_6 = Total cost of traction in naira
X_7 = Productivity enhancing practices scored, β_0 = constant term
β_1 - β_7 = coefficients for the respective variables in the regression model, e = error term

Results and Discussion

The results presented in table 1 showed that the average age of farmers in the Kano state is 40.64 years between the range 19 to 71 years, while the farm experience of the respondents in years is given as about 24 years. 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, the average household size ranging between 3-28 people was found to be 10.2, while the level of education of the farmers are equally presented in the table, table 1. It was found that about 8.2% of the farmers had no education, 42.7% had Quranic education and10% had adult education. About 29.1%, 8.2% and 1.8% had primary, secondary and post-secondary education respectively. Education propels farmers to adopt innovations and technologies that are vital for enhancing productivity. Contact with extension services, that frequency of contact, is shown to be that over 50% off the respondents have between weekly to monthly contacts with extension services in the study area. Only about 23% of the farmers responded to either once, twice or no response at all to contact with extension services.

Productivity Enhancing Farm Practices and Usage by Farmers: The distribution of respondents based on the productivity enhancing practices usage in presented in table 2. The use of pesticides and herbicides among farmers is accounted for by 77.3% 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 94.5% 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 74.5% and 80.9% 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. Also, only 12.7% of the sampled farmers in the state had access to credit facilities.

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. The result as presented in Table 2 shows that only 27.3% of the sampled farmers use tractor facilities. The availability and patronage of technical labour, which in essence has to do with labourrequirements for 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 farmers in Kano states respectively agree to the presence of technical know-how personnel though only 51.5% of these farmers have access to patronize these technical men in the state. In other words, 49.5% of those that responded to being aware of technical labour do not patronize them.

Influence of Productivity Enhancing Practices on Farmers' Income: A Linear functional form was used to run total revenue against the variables. The regression result is as presented in table 3 as the usage of productivity enhancing practices, total cost of fertilizer, total cost of improved seed and chemicals were found to be significant at 1% level. Total cost for traction was significant at 10% level of significance. The R square value was 57.183% and the F-value was found to be significant at 1%. Worthy to note is the fact that the score of productivity enhancing practices usage, X_7, which was included to show the influence of usage on farmers total revenue, was found to the significant at 1% level to the total revenue of the farmers. What this implies is that, if the farmers will adopt the use of these farm practices identified, it will go a long way to improve their standard of living, as in effect, the farmers' income (total revenue) is enhanced because of the significant, positive relationship this has on their income.

Table-1
Socio-economic variables of farmers in Kano state

Variables	Mean and Stand. Deviation	Range
Age in years	40.64 [29.18]	19-71
Farming Experience in years	24.02 [11.12]	2-56
Household size	10.2 [4.76]	3-28
Education Level	Frequency	Percentage
No Formal Educ.	9	8.2
Quranic Education	47	42.7
Adult Education	11	10.0
Primary Education	32	29.1
Secondary Education	19	8.2
Post-Secondary Education	2	1.8
Total	110	100
Contact with Extension Services		
Weekly	25	22.7
Monthly	35	31.8
Bi-Monthly	15	13.6
Quarterly	10	9.1
Once/Twice a year	13	11.8
No Response	12	10.9
Total	110	100

Table-2
Distribution of respondents according to productivity enhancing practices adopted

Productivity Enhancing Practices	Frequency	Percentage
Chemicals Use	85	77.3
Fertilizers Use	104	94.5
Improved Seeds Use	82	74.5
Use of Credit Facilities	14	12.7
Animal Traction	89	80.9
Tractor Facilities	30	27.3
Crop Rotation Practice	81	73.6
Technical Labor Awareness	68	61.8
Technical Labor Patronage*	35*	51.5*
Storage Practice	70	63.6
Crop Processing	37	33.6
Market Accessibility	96	87.3
Class Total	**110**	**100**

*Class total is 68

Table-3
The regression result of respondents' revenue function in Kano state

Variables	Standard Error	Coefficient Stand. Error Coefficient
Total Land Area (ha) X_1	26.813 [1.490]	39.951
Total Cost of Labour (₦) X_2	245.148 [-0.805]	-197.424
Total Cost of Improved Seed(₦) X_3	2.225 [3.950]***	8.789
Total Cost of Fertilizer(₦) X_4	0.587 [4.290]***	2.518
Total Cost of Chemicals(₦)X_5	5.781 [5.781]***	33.420
Total Cost of Traction (₦) X_6	1.398 [1.685]*	2.356
Productivity Enhancing Practices X_7	20.179 [4.251]***	85.775
Constant a_o	481.17 [0.136]	65.343
Multiple R = 0.75619, R Square = 0.57183, Adjusted R Square = 0.54244, F Value =		

Note: ***, **, * = Variables' significance at 1%, 5% and 10% respectively

Conclusion

This research result is indicative that the usage of productivity enhancing farm practices, total cost of fertilizer, total cost of improved seed and chemicals were significant and positively related to the farmers' income. Transformation of traditional farming system for increased food production calls for adoption of these improved farm practices.In the light of this, it is recommended that farmers adopt these practices in order to improve their standard of living by the increase of their level of income. The study also recommends improved extension linkages to sensitize small-scale farmers on the need to adopt these improved farm practices.

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