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IMPLICATIONS OF AGRICULTURAL PRACTICES ON LAND PRODUCTIVITY OF FARMING HOUSEHOLDS IN IMO STATE, NIGERIA

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Abstract

The use of variant agricultural practices has marred the productivity of the farmers to an immeasurable extent. Hence the study evaluated the implications of agricultural practices on land productivity of the farming households in Imo State, Nigeria. Multi-stage sampling technique was used to select 120 crop farmers from the three agricultural zones of the State. Data were analyzed using descriptive statistics and ordinary least squares multiple regression technique. Results showed that farmers have a mean household size of 7 persons, 19 years farming experience with a net income of ₦84, 000 per cropping season. Result further showed farmers completed their post primary education and cultivated less than 2.0 hectares per unit area of land. The use of agricultural practices such as crop rotation, continuous cropping, bush burning, mixed cropping and mulching are significant at various levels and therefore have strong implications on land productivity of the farmers. Farmers are faced with series of constraints' such as capital, technical known-how, land tenure difficulties, etc. which limits land productivity and adoption capacity of the farmers. Hence farmers are encouraged to drop agricultural practices that are concomitant to land productivity and embrace improved ones that are technically appropriate, socially acceptable, environmentally friendly and economically suitable.

Key words**:** *implications, agricultural practices, land, productivity, farming households*

INTRODUCTION

Agricultural production accounts for about 30 percent of gross domestic product (GDP) in Nigeria as well as offers employment opportunities to a large number of people in the country. Agriculture provides the basic needs of individuals in form of food, clothing, shelters, medicine, recreation, etc. Hence, agriculture is viewed as a thriving enterprise in the World [2]. It is a productive sector where the free gifts of nature namely land; water, etc. are effectively utilized.

Agricultural development in Nigeria is multifaceted having spread rapidly with respect to time and space. The introduction of green revolution and operation feed the nation by past governments brought about the use of improved agricultural practices and inputs to enhance the production potential per unit of agricultural land, time and output [1]. In recent times, there has been a global trend towards the intensification of agricultural land-use practices and changes in farming techniques have been collimated by recent agricultural technologies. This has resulted in the production of large quantity of inorganic manure in order to meet increasing demands for food and other agricultural products [3]. Furthermore, through modern advances in technology, there has been a tremendous expansion of agriculture regardless of the suitability of the land, and thus the development of improved crop varieties has made it possible to cultivate under marginal environmental conditions.

New agricultural techniques are very efficient and produce high crop yields but can also

have adverse effect on the environment [9].

The relevance of the agricultural sector as a veritable tool for poverty reduction has been greatly undermined by less attention by the governments, cum inadequate plant-nutrient supply, depletion of soil organic matter, soil erosion, etc. In an effort to overcome these challenges, farmers have engaged in the use of variant agricultural practices to drive high production and output irrespective of its adverse consequences. Furthermore, the land productivity of the farmers has remained low due to the type of agricultural practices of the farmers coupled with unfavorable climatic conditions. As such erratic rainfall patterns present serious challenges to food production in the State. More importantly, government measures to promote agricultural technologies lack a clear picture of the role of agro-ecology [1]. As such the distribution and amount of rainfall varies both in spatial and temporal terms across and within Nigeria. This connotes that it is vital to consider the distribution of rainfall when formulating policies that promote the adoption of productivity-enhancing technologies, such as inorganic manures and other conservation tillage practices. However, the key to tackling these issues in the State lies not only in the adoption of agricultural technologies that enhance water retention capacities of soils, but also in the adoption of farming technologies that rely mainly on inexhaustible farm resources which reduce production costs and risks. An example of such technology is the use of improved agricultural practices that are technically appropriate, environmentally friendly, and are economically and socially acceptable [5]. Consequently, this study seeks to evaluate the implications of agricultural practices of farmers on land productivity in Imo State, Nigeria.

MATERIALS AND METHODS

This research was conducted in Imo State, which is located in the South Eastern part of Nigeria with a land area of 5,530 sq km. The State lies between latitudes $4^0 45^I$N and $7^0 15^I$N and Longitudes $6^0 50^I$E and $7^0 25^I$E. The State shares boundaries with Abia and Cross Rivers State to the East, Delta State to the West, Rivers State to the South and Enugu and Anambra State to the North. The State is made up of 27, Local Government Areas which are grouped into three agricultural zones namely; Owerri, Orlu and Okigwe. Farming is the predominant occupation of the rural inhabitants. Almost all the families in the area engaged in farming either as a primary or secondary occupation. Multi-stage sampling technique was used for this study. In the first stage, two local government areas (LGAs) were randomly selected from each of the three agricultural zones of the State. The second stage involved a random selection of 2 communities from each of the LGAs. From these communities, 3 villages were randomly selected and thus, 5 crop farmers were picked from each of these villages giving a total sample of 180 farmers but from the questionnaire collected only 120 farmers were found useful for data analysis. The zonal ADP's provided the sample frame for this selection. Data were analyzed using descriptive statistics and ordinary least squares multiple regression technique.

The model is presented as follows:

$$LP_f = (\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + e) \quad (1)$$

where:

LP_f = Land productivity of the farmers (Kg/Naira)

$\beta_O - \beta_7$ = Parameter estimates

X_1 = Crop rotation (Area of land used)

X_2 = Continuous cropping (Area of land used)

X_3 = Bush fallowing (No. of years of fallow period)

X_4 = Bush burning (Area of land used)

X_5 = Mixed cropping (Area of land used)

X_6 = Mulching (Area of land used)

X_7 = Inorganic fertilizer (No. of bags used)

e = Error term.

RESULTS AND DISCUSSIONS

Socio-economic Characteristics of the Farmers

Table 1 shows the socio-economic characteristics of the farmers.

The mean age of 54 years implies that farmers are in their productive age and therefore could maximize available resources for increased production and outputs. This corresponds with [10].

Table 1. Socio-economic characteristics of the farmers

Variable	Mean
Age	54
Education	13
Farming Experience	19
Extension Contacts	14
Household Size	7
Farm Size	1.6
Net Income	84,000

Source: Field Survey, 2017.

The mean level of education was 13 years. This implies that almost all the farmers completed secondary school. This further indicates that the farmers could at least read and write and also evaluate new farming innovative technologies [9]. Farming experience shows a mean of 19 years. This implies that the farmers are well experienced in farming business and this could lead to increase in efficiency of production. Extension contacts reveal a mean of 14. This indicates that the extension agents visited the farmers 14 times per cropping season. Extension services expose farmers to new innovations and modern ways of farming which enhances productivity of the farmers. This is in conformity with [8].

The mean household size was 7. This implies that the farmers have a large family size which could be utilized in farm production activities and this agrees with [4]. Farm size has a mean of 1.6 hectares, which indicates subsistence farming. The net income reveals a mean of ₦84, 000. This implies that the farmers are economically efficient in farm production.

Types of Agricultural Practices Used by the Farmers

Table 2 below shows the types of agricultural practices used by the farmers in the area.

About 53% of the farmers practiced crop rotation. Efficient management of the soil using crop rotation enhances soil fertility as well as the productivity of the land. This agrees with [9].

Continuous cropping is practiced by 85% of the farmers. This farming method is largely practiced due to unavailability of lands and land tenure patterns in an area. About 6% of the farmers practiced bush fallowing. This is an old farming technique used by rural farmers to enhance the fertility of the soil and replenish lost soil nutrients. Though its' mainly practiced where land is sufficient.

Again, 83% of the farmers practiced bush burning. Bush burning is also an old traditional system which satisfies the immediate needs of the farmers in a short period and exacerbates the land in the long-run.

Mixed cropping is practiced by 95% of the farmers. In this type of farming, farmers' cultivates more than one type of crops in a bid to maximize available lands.

Mulching accounted for 66% of the farmers and is used to support the soil against erosion and degradations.

More than 87% of the farmers used inorganic manure as means to increase the productivity of the soil. This soil technique has the potential to increase yield per unit area of land with its attendant adverse consequences.

Table 2. Types of Agricultural Practices Used by the Farmers

Agricultural Practices	*No. of Farmers	Percentage of Farmers
Crop rotation	63	52.5
Continuous cropping	102	85.0
Bush fallowing	7	5.8
Bush burning	99	82.5
Mixed cropping	114	95.0
Mulching	79	65.8
Inorganic fertilizer	106	88.3

Source: Field survey, 2017. *Multiple Responses Recorded

Implications of Agricultural Practices on Land Productivity of Farmers

Table 3 below shows the estimated regression analysis on the implications of agricultural practices on land productivity of the farmers.

Four functional forms were fitted in with the Cobb-Douglas function chosen as the lead equation based on the highest coefficient of multiple determination, highest F-value, lowest standard error and highest number of significance levels of the independent variables. The F-value was significant at 1% level as this confirms the fitness of the model. The R^2 shows a value of 0.8021 which implies that about 80.2% of variations in the dependent variable was explained by the independent variables investigated. The coefficient of crop rotation is significant at 1% level and has a positive relationship with the land productivity of the farmers. This implies that increase in the use of crop rotation by the farmers increases land productivity. Good management of the soil through crop rotation ensures adequate nutrient availability through-out the cropping season and maintain balanced soil ecosystem [7]. Continuous cropping has an inverse relationship with land productivity and is significant at 1% level. This implies that a 1% increase in the use of continuous cropping would bring about 7.69% decreases in land productivity of the farmers. The use of continuous cropping pattern is widely practiced due to unavailability of lands cum land tenure systems prevalent in an area [10]. The coefficient of bush burning is significant at 5% level and negatively related to land productivity. This implies that a step-up in the use of bush burning by the farmers decreases the productivity of the land. The burning of the bush exacerbates soil leading to erosion, water run-off and degradation [4]. Mixed cropping is significant at 5% and positively related with land productivity. This indicates that a 1% increase in the use of mixed cropping by the farmers will bring about 9.93% increases in the productivity of the land. Mixed cropping is usually practiced to avert the risks of total crop failure.

Table 3. Implications of Agricultural Practices on Land Productivity of Farmers

Variables	Coefficients	T-values	Significant levels
Constant	108.321	1.0441	Ns
Crop rotation (X_1)	0.0654	3.2042	**
Continuous cropping (X_2)	-0.0769	-3.4107	**
Bush fallowing (X_3)	0.0843	1.0021	Ns
Bush burning (X_4)	-0.0904	-2.3720	*
Mixed cropping (X_5)	0.0993	1.9924	*
Mulching (X_6)	0.4763	2.7092	**
Inorganic fertilizer (X_7)	-0.9341	1.2056	Ns
R^2	0.8021		
F-value	45.443		**
N	120		

Source: Field survey, 2017.

The coefficient of mulching is significant at 1% level and has a positive relationship with land productivity. This implies that as the farmers engaged in the use of mulching; the productivity of the land is automatically increased [9]. However, the coefficients of bush fallowing and inorganic manure are not significant even at 5% level. These might be due to the long period of fallow and chemical deposits of inorganic fertilizers.

Constraints to Agricultural Practices in Imo State

Table 4 below shows the constraints to agricultural practices in the area. More than 98% of the farmers indicated lack of capital as a serious constraints to them. Capital is a very vital tool in agriculture as it helps farmers to expand their farm production and purchase other important inputs such as improved seedlings, manures, chemicals, etc. This agrees with [6]. About 97% and 94.2% of the farmers indicated technical known-how and

land tenure difficulties as most challenging to them. Land tenure patterns destabilize farmers from adopting improved farming practices cum inability to practice improved farming techniques. Problem of continuity and climatic challenges accounted for 91% and 89.2% of the farmers. There is always the tendency of farmers to withdraw the use of a particular farming technique when faced with difficulties. At such scenario farmers tends to discontinue the use of such technique and this poses a threat to agricultural productivity [5]. Also changes in climate tend to distort rainfall and temperature patterns in agriculture. However, other identified constraints to agricultural practices in the State include; pests and diseases (87%), conservational attitudes of the farmers (79.2%) and poor innovation exposures (73.3%). These constraints limit the productivity of the land as well as adoption potentials of the farmers at large.

Table 4. Constraints to Agricultural Practices in Imo State

Constraints	*Frequency	Percentage
Technical known-how	116	96.7
Problem of continuity	109	90.8
Poor innovation exposure	88	73.3
Conservational attitudes	95	79.2
Land tenure difficulties	113	94.2
Pests and diseases	104	86.7
Climatic challenges	107	89.2
Lack of capital	119	99.2

Source: Field survey; 2017 *Multiple Responses Recorded

CONCLUSIONS

The findings of the study showed the mean age of the farmers to be 54 years. This implies that farmers are in their productive age and therefore could maximize available resources for increased production and outputs.

Farmers in the area used variant agricultural practices ranging from crop rotation to inorganic manure.

About 6% of the farmers practiced bush fallowing which is an old farming technique used by rural farmers to enhance the fertility of the soil and replenish lost soil nutrients. Variables such as crop rotation, continuous cropping, bush burning, mixed cropping and mulching are significant at various levels and therefore have strong implications on land productivity of the farmers.

Over 98% of the farmers indicated lack of capital and technical known-how as a major constraint impeding land productivity and adoption of agricultural practices.

Hence farmers are encouraged to drop agricultural practices that are concomitant to land productivity and embrace improved ones.

REFERENCES

[1]Altieri, M., 2011, Applying agro-ecology to enhance the productivity of peasant farming systems in Latin America. Reducing poverty through sustainable agriculture. University of Essex, London. 36-38.

[2]Anon, O., 2007, Soil and surface water protection using conservation tillage in northern and central Europe (SOWAP). Technical Final Report. LIFE03 ENV/UK/000617 2007.

[3]Benites, J., Vaneph, S., 2001, Conservation agriculture: for a better environment. 1st World Congress on Conservation Agriculture, Volumes I and II. Published by XUL, Córdoba, Spain for FAO (Food and Agriculture Organization of the United Nations) and ECAF (European Conservation Agriculture Federation), EU Life Project 99/E/308.

[4]Ebewore, S.O., Emuh, F. N., Obiebi, E., 2014, Effects of small scale farming practices on land degradation in Ethiope East Local Government Area, Delta State. Int'l Journal of Agriculture and Rural Development. 17(1):1572-1578.

[5]FAO, 2008, Food security and agricultural mitigation in developing countries. Options for capturing synergies, Rome, Food and Agriculture Organization of the United Nations, Rome Italy.

[6]Nwaru, J.C., 2004, Rural credit markets and resources use in arable crop production in Imo State, Nigeria. An Unpublished Ph.D Thesis, Micheal Okpara University of Agriculture, Umudike, Nigeria.

[7]Onasanya, A.S., 2007, Crop farmers' use of environmentally sustainable agricultural practices in Ogun State, Nigeria. Journal of Environmental

Extension, 6(1):75-78.
[8]Osuji, E.E., Anyanwu, U.G., Ehirim, N.C., Eze, E.U., Tim-Ashama, A., 2017, Economics of processed cassava products in Imo State, Nigeria. Journal of Research in Business and Management, India, 5(3):09-19
[9]Osuji, E. E., 2017, Impacts of sustainable soil management techniques on land productivity and poverty levels of arable crop farmers in Imo State, Nigeria. Unpublished PhD dissertation. Department of Agricultural Economics, Michael Okpara University of Agriculture Umudike, Nigeria
[10]Osuji, E.E., Ohajianya, D.O., Ehirim, N.C., and Eze, E.U., 2012, Effect of land use patterns on agricultural productivity in Imo State, Nigeria. International Journal of Food and Agricultural Research. 9(1): 81-89.