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DETERMINANTS OF LAND ACCESSIBILITY AMONG FOOD CROP FARMERS IN KAINJI LAKE NATIONAL PARK SUPPORT ZONE, NIGER STATE, NIGERIA

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ABSTRACT

Land is an important socio-economic asset in societies where wealth and survival are restrained by access to land. This study examined the determinants of land accessibility among food crop farmers in Kainji Lake National Park Support Zone Communities, Niger State, Nigeria. Multi-stage sampling procedure was used to select 135 food crop farmers from 14 settlements for the study. Primary data were obtained on socioeconomic characteristics and factors influencing land accessibility among the respondents with the use of a well-structured questionnaire. Data were analysed using descriptive statistics and Ordinary Least Square (OLS) regression. Results showed that majority of the respondents were male (93.3%), married (85.9%) and had no formal education (64.4%). The mean age, household size, total farmland size, farming experience of the respondents were 42 years, 9 members, 7.5 hectares and 21 years respectively. Their average distance of home to farm(s), farm(s) to nearest market, home to nearest market and estimated net farm income were 3.7 km, 6.9 km, 8.6 km and ₦138,681.5 respectively. The results of regression analysis showed that age of the food crop farmers ($ß_1$ = -0.028), farming experience ($ß_3$ = 0.035) and estimated net farm income ($ß_7$ = 5.113), average distance home to farm(s) ($ß_4$ = 0.099) and home to nearest market ($ß_6$ = 0.032) significantly ($p < 0.05$) influenced land accessibility among crop farmers. It was recommended that food crop farmers' socio-economic factors should be considered important in designing extension intervention strategies in the control of farmland expansion in Kainji Lake National Park Support Zone Communities, Niger State, Nigeria.

Keywords: National Park, support zone communities, food crop, land accessibility

Introduction

Land is the pivot of man's absolute existence. Sheng (1989) stressed this by asserting that through the past, in the present, and through the foreseeable future, land continues to be the foundation of our food supply chain, which is a vital recurrent and capital resource of any nation. However, Vink (1975) observed that in most cases, because of the temporary high economic gains, man may not care about the effect of the use to which land is subjected. The need for putting land to optimum use through adequate and effective planning has never been greatly felt than at present, when rapid population growth and urban expansion are making available agricultural land scarce (Akinbola, 2003).

Land use is the end to which land is allocated, assuming a conscious decision to use it for a desired end (Marion, 1960; Reardon, 1989). In the rural areas, land use patterns are governed mainly by the requirements of the agricultural industry, which is important for the livelihood of the people. In Nigeria, given the level of agricultural technology, the capacity of available land had been exceeded by 40-50 million people who mine the soil nutrients to support themselves (FAO**,** 2000).

Nigerian lands are either productive or non-productive for agricultural purposes.

Because of the long fallow period, the traditional agricultural production system was stable and biologically conducive to soil nutrient replenishment (Kang *et al.*, 1989**;** Scherr, 1999). Increasing demographic pressure has now compelled expansion of crop production to marginal lands. Persistent deforestation for agricultural production is now a form of environmental degradation as crop yields drastically decreased (Matlon, 1984; Kang *et al.*, 1989; Ehui *et al.*, 1992; Pinstrup-Andensen *et al.*, 2001; Onya *et al.*, 2019). In Nigeria, the scope of the land problem can be well conceptualized from the fact that, despite that the nation depends mainly on oil revenue since the 1970s, land remains the most important long term resource base for the direct and indirect support of plants and animals, which man uses (NEST, 1991; Marie *et al.*, 2014).

The basis of agricultural production and the most important production factor for farmers is land. Land is a very strategic socio-economic asset, particularly in poor societies where wealth and survival are measured by control of, and access to land (Titilola and Jeje, 2008). Marie *et al.* (2014) noted that, land is the most important economic resources most particularly for developing countries with largely rural populations and most people earn a living through agriculture. It has remained an important factor of production since the creation of man and a fundamental factor of production in the agricultural sector all over the world and provides a basis for crop production in Nigeria and sub-Saharan Africa. Secure access to productive land is critical to millions of poor people living in rural areas and depending on agriculture, livestock or forests for their livelihood (Onya *et al.*, 2019). It reduces their vulnerability to hunger and poverty; influences their capacity to invest in their productive activities and in the sustainable management of their resources; enhances their prospects for better livelihoods; and helps them develop more equitable relations with the rest of their society, thus contributing to justice, peace and sustainable development (IFAD, 2008). Access to land and tenure security have a marked effect on expectations of a return on an investment of both labour and capital and many development thinkers have attributed the weakened incentives to invest in agriculture to the poor access to land and land ownership title (Migot-Adholla and Bruce, 1994). If farmers do not have secured land rights, they will have few incentives to engage in sustainable agricultural production or to consider the long-term environmental impact of over-exploitation of land's nutrients (Oyekale, 2012). Mintzer (2010) and Henri-Ukoha *et al.* (2014) asserted that most farmers work on small parcels of land that are either leased to them or have been acquired through family bonds or purchase. But all too often, they are not given the means to produce as much as they want (Onya *et al.*, 2019).

It is generally argued that small farmers use their limited resources and knowledge efficiency via their traditional farming systems. Among these limited resources, farm size plays an important role both in the level of their income and in their welfare. Farm size varies from one country to another and is a phenomenon primarily determined by non-economic variables, such as laws of inheritance, social conditions, historical consequences, nature of the land, or government policies (Dillon and Hardaker, 1980).In addition, it is recognized that farm size changes very slowly over many years under the influence of both political and social forces; however the influence of economic factors should not be neglected (Bachman and Christensen, 1967). Such factors appear to play an important role in the case of farm size in Nigeria.

The size of a farm can be measured in various ways. Choosing a measure of farm size is somewhat arbitrary even assuming that all appropriate information is available. Alternative criteria such area cultivated, output, or input levels may all be used depending upon the proposition of the study. The most common criterion for measuring farm size in various countries is the area cultivated (Huang, 1973; Dillon and Hardaker, 1980; Bamire, 2010). Because of the limitation of detailed data for Nigerian agriculture, farm size is measured in terms of area cultivated.

Methodology

The study was conducted in Support Zone (SZ) of the Borgu Sector of Kainji Lake National Park (KLNP). It lies between 9° 40'–10° 30' N and 3° 30' – 5° 50' E. It is 3,970 Km^2 in size. The Support Zone (SZ) of the Borgu Sector of Kainji Lake National Park (KLNP) is a 3 - 15 Km border (boundary demarcation not stable) surrounding the park; created to focus conservation and development assistance on those villages who bear the brunt of impacts arising from creation of National Park close to them and whose income and livelihood have been adversely affected by the creation of KLNP. The objective of the SZ is to protect and maintain the biological diversity and other natural values of the area in the long–term, promote sound management practices for sustainable production purposes and protect the natural resource base from other land-use purposes that will be detrimental to the areas biological diversity, also to contribute to local development of the SZ settlements.

Primary data were collected through the use of structured questionnaire administered in selected settlements in the peripheral support zone of Kainji Lake National Park (Borgu Sector), Niger State. A multi - stage sampling procedure was used for the purpose of selecting food crop farmers. In the first stage the study area was sectionalized into four sub-areas and thereafter identifying the food crop farming settlements that is within 15 Kilometre borders of the surrounding four sub-areas of the Borgu sector boundary of Kainji Lake National Park. Following this, a minimum of three settlements were selected using random sampling method in each sub-area while a minimum of ten food crop farmers (because of unequal population in the settlements in the sub-area) were purposively selected at random within these limits. 150 food crop farmers from 15 settlements were interviewed. Only 135 food crop farmers from 14 settlements were later used for data analysis due to incomplete response.

Data collected were analysed using descriptive statistics such as means and percentages as well as econometric model such as the Ordinary Least Square Regression (OLS). OLS was used to identify the determinants of farmland size of food crop farmers in the study area. The linear model is thus specified as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Y = Farmland size/holding (Ha)

X_1 = Age of food crop farmers (Years)

X_2 = Household Size (Household Members)

X_3 = Farming Experience (Years)

X_4 = Average Distance of Home to Farm(s) (Km)

X_5 = Average Distance of Farm(s) to Nearest Market (Km)

X_6 = Average Distance of Home to Nearest Market (Km)

X_7 = Estimated net farm income (Naira)

b_i = Coefficient

$i = 1, 2, 3,\ldots, n$

a = Constant

e = Stochastic Error Term

Results and Discussion

Socioeconomic characteristics of the respondents

The results in Table 1 showed that majority (93.3%) of the respondents were male. This implies that the food crop farmers are more of male. Thus, male food crop farmers engage in food crop farming more than female food crop farmers. This could be due to the socio-cultural milieu of the area which gives males more access to production resources like land where food crop farming is practised more than females. The marital status of the food crop farmers indicated that the majority of the respondents (85.9%) were married. This may be as a result of high labour requirement in agricultural production in which they use members of their family as labour force (Okoye, 1999) while about 64.4% of the respondents had no formal education.

About half (51.9%) of the respondents are more than 40 years old. The respondents' mean age was 41.8years. This implied that farmers involved in food crop production were not young in age. Majority (75.9%) of food crop farmers had household size less than and equal to 10 members with an average household size of 8 members. The relatively large household size of the food crop farmers is attributable to the dominance in some parts of the State of the Islamic religion which permits marriage with four wives. The household size is also expected since traditional farming is labour intensive and most farmers would employ family labour for their production activities in other to have more hands to assist on the farm. This was observed by Alabi *et al.* (2005). More so, the results might point to the fact that most food crop farmers in the study area used the proceeds from farming to complement the non-farming income of their families and employ relatively large and affordable family labour in arable crop production (Tanko and Alidu, 2016).

The results in Table 1further showed that nearly half of food crop farmers' food crop farmers in the study area (53.3%) have farming experience above 20 years with an average farming experience of about 21 years. The result implied that food crop farmers have been in production for a long time and this is good indication for production. It also means that farming business is a well-established venture in the study area with vast potentials for increase in private investment (Nmadu *et al.*, 2012).Majority of the food crop farmers (60.7%) made not more than an average of 150,000 Naira as their estimated net farm income overtime having a mean of ₦138,681.5 in the study area. This implied that that crop farming activities in the study area is lucrative as reported by Adebayo (2016). About 74.4% of food crop farmers have their total farmland size not more than 10 ha. The mean total farmland size for all the food crop farmers stood at 7.47ha. This implied that most of the farmers had fairly large farmland size for production of food crops. The result could also be linked to the expansion and continuous subsistence nature of cultivation of arable crop enterprises in the study area (Ajibefun *et al.*, 2002).

Majority of the food crop farmers (82.2%) travelled not more than 5 kilometres from their house to the farm(s). The mean average distance of home to farm(s) is 3.7 Km. The implication of this is that the distance travelled by the farmers who do not have means of transportation is likely to have a negative influence on labour hours spent by the farmers on their farms thereby reducing the farm size (Jirgi and Viljoen, 2013). Majority of the food crop farmers (60.7%) travelled not more than 5 kilometres or more from their farm(s) to the nearest market. The mean distance of their

farm(s) to the nearest market is 6.9 Km. The distance travelled by the farmers who do not have means of transportation is likely to have a negative influence on marketing efficiency of farm products by the farmers on their farm(s) to the nearest market. The shorter distance of their farm(s) to the nearest market may increase the food crop farmers' farm size. Likewise, about 66.7% of the food crop farmers travelled not more than 5 kilometres from their home(s) to the nearest market. The mean average distance of their home to the nearest market is 8.6 Km (Jirgi *et al.* 2016).

The mode of land acquisition and ownership signified that the major form of land ownership and acquisition was through inheritance (63.7%), rent (63.0%), communal land (51.9%) and purchase (48.9%). Land ownership by inheritance is prevalent and has always been a dominant form of land ownership in Africa (Onya *et al.*, 2019). This is in line with Ekenta *et al.* (2012) who found that land inheritance was the most common ownership structure among farmers in agricultural production.

Table 1: Socio-Economic Characteristics of the respondents

Personal characteristics		Percentage	Mean
Sex of food crop farmers	Female	6.7	
	Male	93.3	
Marital Status of food crop farmers	Not Married	14.1	
	Married	85.9	
Educational status of food crop farmers	No Formal Education	64.4	
	Primary Education	8.9	
	Secondary Education	11.9	
	Tertiary Education	14.8	
Age of food crop farmers (Years)	= 40	48.1	41.8
	>40	51.9	
Household size (Persons)	= 10	75.9	7.8
	> 10	24.1	
Household total farmland size/holding (Ha)	= 10	74.4	7.5
	> 10	25.6	
Food crop farmers farming experience (Years)	= 20	46.7	20.8
	> 20	53.3	
Av. distance of home to farm(s) (Km)	< 5	82.2	3.7
	= 5	17.8	
Av. distance of farm(s) to nearest market (Km)	< 10	88.9	6.9
	= 10	11.1	
Av. distance of household home to nearest market (Km)	< 10	66.7	8.6
	= 10	33.3	
Estimated net farm income(Naira)	= 150,000	60.7	138,681.5
	= 150,001	39.3	
Mode of land acquisition and ownership	Inheritance	63.7	
	Rent	63.0	

Leased	36.3
Gift	11.1
Communal land	51.9
Purchase	48.9
Pledge	12.6
Open Access	14.8

Determinants of farm size among the respondents

The linear equation presents the multiple regression analysis, showing the determinants of farmland size of food crop farmers in the study area. The result indicated that these factors determining farmland size of food crop farmers in the study area were significant and correlated to the association with multiple coefficients of correlation (R = 0.987). Similarly, the collaborative variation (R Square) that was accounted for by these factors determining farmland size of food crop farmers in the study area was 0.975. This indicated that the independent variables explained 97.5% of the variations in the dependent variable.

The age of food crop farmers, household size, food crop farmers farming experience and estimated net farm income of the food crop farmers are factors determining farmland size of food crop farmers in the study area. In addition, the average distance food crop farmers home to farm(s), farm(s) to nearest market and home to nearest market were used as explanatory variables to determine the farmland size of food crop farmers in the study area.

The regression result is presented below:

Table 2: Determinants of farm size among the respondents

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	0.086	0.301		0.286	0.776
	Age of food crop farmers(Years)	-0.028	0.010	-0.062	-2.766	0.007
	Household size (Household members)	0.016	0.012	0.019	1.293	0.199
	Farming experience (Years)	0.035	0.012	0.065	2.874	0.005
	Av. Distance of home to farm(s) (Km)	0.099	0.040	0.044	2.457	0.015
	Av. Distance of farm(s) to nearest market (Km)	-0.004	0.026	-0.003	-0.166	0.869
	Av. Distance of home to nearest market (Km)	0.032	0.009	0.058	3.737	0.000
	Estimated net farm income (Naira)	5.113	0.078	0.973	65.615	0.000

Dependent Variable: Farm Size/holding (Ha)
R = 0.987; R Square = 0.975; Adjusted R Square = 0.973; F = 680.46***;
Std. Error of the Estimate = 0.65

The results in the specified model presented showed that age of food crop farmers($ß_1$ = -0.028), farming experience of food crop farmers ($ß_3$ = 0.035) and estimated net farm income of household ($ß_7$ = 5.113), average distance food crop farmers home to farm(s) ($ß_4$ = 0.099) and home to nearest market ($ß_6$ = 0.032) significantly ($p < 0.05$) determined the farmland size of food crop farmers in the study area.

The implication of this result is that age and farming experience of food crop farmers, food crop farmers' estimated net farm income, average distance home to farm(s) and home to nearest market are the determinants of food crop farmers' farmland size in the study area. This means that for every one percent increase in age of food crop farmers, it is expected that food crop farmers' farmland size would decrease by an average of 2.8% and vice versa. The older the food crop farmers, the less likely the food crop farmers demand for more farm land which may result to low chances of deforestation for more land to farm in the study area.

The farming experience of food crop farmers exercised a great impact on the prediction of the food crop farmers' farmland size in the study area. Hence, a high level of farming experience of food crop farmers would increase the farmland size of the food crop farmers in the study area. The implication for this is that for every one percent increase in farming experience of food crop farmers, it is expected that food crop farmers' farmland size would increase by an average of 3.5% and vice versa. The more farming experience of the food crop farmers, the more likely the food crop farmers' demand for more farmland for the household members which may result to high chances of deforestation for more land to farm in the study area.

Furthermore, the estimated net farm income of food crop farmers' increases with an increase in the farmland size of the food crop farmers in the study area. This implied that *ceteris paribus*, an increase in 1% of estimated net farm income of food crop farmers would increase the farmland size of the food crop farmers in the study area by 511.3% and vice versa, that is, increase in farm size by five times its previous size. The more food crop farmers' estimated net farm income incurred, the more the likelihood of farmland expansion in the study area.

Also, the average distance food crop farmers home to their farm(s) increases with an increase in the farmland size of the food crop farmers in the study area. This implied that all things been equal, an increase in 1% of average distance food crop farmers home to their farm(s) would increase the farmland size of the food crop farmers in the study area by 9.9% and vice versa. The farther the food crop farmers home to their farm(s), the more the tendency of farmland enlargement in the study area.

Similarly, the average distance food crop farmers home to the nearest market increases with an increase in the farmland size of the food crop farmers in the study area. This implied that an increase in 1% of average distance food crop farmers home to the nearest market would increase the farmland size of the food crop farmers in the study area by 3.2% and vice versa. The farther the food crop farmers home to nearest market, the more the affinity of farmland extension in the study area.

However, the high F value indicated that the data obtained does not well support the stated null hypothesis. In other words, the alternative hypothesis is compatible with the observed data. Also, the Standard Error of Estimate (0.65) measured the variation of the observable made around the computed regression line. The small value of Standard

Error of Estimate showed that the dots are closer to the regression line and this brought about a better estimate based on the equation of the line. In an attempt to predict human behaviour, R-square value of the model was higher than 50%. This is due to the fact that humans are simply harder to predict than physical processes (Frost, 2019).

Conclusion

The study examined and made contributions to research on the determinants of farmland size of food crop farmers in Kainji Lake National Park Support Zone Communities, Niger State, Nigeria. From the results of the study, it can be concluded that majority of the food crop farmers were male, married and had no formal education. Also about half of them were older than forty years old and have a relatively large household size, fairly large farmland and are experienced in food crop farming. Majority of the food crop farmers live closer to their farmlands while their homes and farmlands are far from the nearest market. However, farming experience of food crop farmers, estimated net farm income of household, average distance food crop farmers' home to farm(s) and their home to nearest market positively and significantly determined the farmland size of food crop farmers while age of food crop farmers negatively and significantly determined the farmland size of food crop farmers in the study area.

Based on the findings of this study, it is recommended that food crop farmers' socio-economic factors should be considered important in designing extension intervention strategies in the control of farmland expansion in Kainji Lake National Park Support Zone Communities, Niger State, Nigeria.

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