Original Research Article

CONSTRAINTS TO AGRICULTURAL PRODUCTIVITY IN KAINJI LAKE NATIONAL PARK, NIGERIA

ABSTRACT

The relationship between agricultural practices and environment has been relatively stable and favourable, but it is now being disturbed by certain forces and exploitation of natural resources that has led to serious environmental degradation. The constraints to agricultural productivity within Kainji Lake National Park (KLNP) was established in this study. The research accessed agricultural practices around the communities within the study area. Five districts were examined and each district contains three villages resulting into fifteen villages in all. A total of six hundred copies of questionnaires were administered. The harvested data for this research were analysed using both descriptive and inferential statistics, stepwise multiple regression was adopted to identify the contribution of agricultural constraints to the total food production in the study area. The major constraints to the total agricultural productivity in the study area are lack of modern farming equipment, poor marketing, high cost of human labour, inadequate extension services, lack of funds and credit facilities and high cost of transportation to urban centres. The multiple regression model shows that a strong positive relationship exists among the variables tested. In the constraint affecting agricultural productivity around KLNP Nigeria, the equation obtained is in this form: $Y=3.16 + 0.03X_1 – 3.21X_2 – 2 .92X_3 + 1.54X_4 + 3.09X_5 + 2.11X_6$.

KEYWORDS: Agriculture productivity, agricultural Constraint, Conflict, Degradation

1. INTRODUCTION

Agriculture occupies more than one-third of the World's land area and it is the leading cause of habitat destruction on a global basis, be it on traditional/ small scale commercial systems. Mathus theory says that the size and growth of the population depends on the food supply and agricultural methods, but Boserup's theory opposes this by saying that the agricultural methods depend on the size of the population. Malthus states that in times when food is not sufficient for everyone, the extra people will have to die. However, Boserup states that in times of pressure people will find ways to increase the production of food by increasing workforce, machinery and fertilizers among others.

Human demographic growth has caused increased demand for natural resources. In Africa, most people depend directly on these resources for their livelihood. In Nigeria like many other developing countries, majority of the population depends on agriculture for food, personal needs and income. Agriculture is the science and art of raising crops and animals for the benefit of man and it is as old as civilization itself. The relationship between agricultural practices and environment has been relatively

stable and favorable, but it is now eventually been disturbed by certain forces and exploitation of natural resources that has led to serious environmental degradation. This varies from country to country and Nigeria is not an exception. Sekitoleko (1993) reported that any agricultural activity that upsets the natural ecosystem and the extent to which is disturbed depends on the nature, intensity and duration of such activity. These activities can be categorized into land/soil degradation, drainage, over harvesting and burning of wetlands, pollution of water bodies, land and air, overfishing and encroachment of protected area.

Conflict between agriculture and environment protection is a challenge to mankind for survival. Conflicts arise when people who traditionally use natural resources around them are either controlled or forbidden on such resources (Norton-Griffths, 1996). Biodiversity conflict according to O' Leary and Bingham (2003) occur when there are fundamental and ongoing differences amongst parties concerning value and behaviour as they relate to the environment. In addition conflicts are situations where people deliberately, with or without knowledge of the consequences of their actions destroy biodiversity, particularly when they perceived a positive impact on their livelihood (Young et al., 2003; Young et al., 2005). For instance decision to establish a park where cultivation and grazing is prohibited requires removal of some people who used these lands. There may not be peace because the local people would feel that they are being deprived of something that rightfully belongs to them. Such affected individuals would have been given the opportunity in the planning process or been offered access to some alternative resources that would substitute their traditional lifestyle.

It has been reported that about one-third of vertebrates have suffered either extinction or a drastic reduction in population as a result of human activities, whether hunting, agricultural practices, urban industrial development or poisoning (Yoram and Heinrich, 1988). Although hunting was the main cause of several species extinction, habitat destruction has also been responsible for the disappearance of large numbers of species. The major natural resources, which include land, water, associated soil, plants and animals are of great importance to man. Most of the food comes from plants grown on the land or from animals, which themselves live by eating plants. Therefore, man's survival depends on agriculture. Natural areas which shelter ethnic groups dependent on hunting, fishing, and food gathering preserve the heritage of human wisdom derived from a long association with nature, such as the use of wild plants and animals for medicinal purposes.

In Nigeria, there has been an increase in the number of conflict vis-à-vis conservation and natural resources protections. The Kainji conservation for example has been extending its services on the natural ecosystem in the last one decade. This has resulted in the increase in number of conflicts between wildlife operations, farmers and the communities at large. The basic question still remains;

What are the constraints to agricultural productivity within the Kainji Lake National Park (KLNP)?

2.0 MATERIALS AND METHODS

Data obtained from both primary and secondary sources. The primary source of data were of two types. First, questionnaires were prepared and used to collect information on agricultural practices and productivity the residents around KLNP in order to get firsthand information. Secondly, interviewing method was employed. The study area (KLNP) has a total population of about 59,823 (Table 1) as compiled by the Global Environmental facility (GEF) World bank assisted project as at June 2009.

2.1. The interview method: Key National Park officials were also interviewed on the attitude of the farmers as it relates to conservation policies.

2.2. Field observation: this was adopted to explore actual human activities and the farming system employed in and around the park by direct observation.

2.3. Informal discussion method: the people were engaged in informal discussions and notes were taken.

Simple Randomized Sampling technique was employed in selecting the studied villages in each district. Five districts of which three communities were sampled from each district. Thirty copies of questionnaires were administered which make up total of six hundred copies (Hammond and Mc-cyllaph,1978). Therefore, a total of 598 which is 10% houseold sample of the total population studied were used. This was however rounded up to 600 to make a complete figure. Data obtained were analyzed using both descriptive and inferential statistics.

A stepwise multiple regression was adopted to identify the contribution of agricultural constraints to total food production in the study area (Olawepo. 2010). For this study, our dependent variable Y is the total acre cultivate and total food production in tonnes, while the independent variables 1-6 are the constraints. Thus, our equation could be written as:

$Y = a + b_1X_1 + b_2X_2\text{-------}b_n X_n + e$

Where Y = acre

a = Intercept

b_1, b_n = parameter estimates

e = standard error

X_1 = Lack of modern farming equipments

X_2 = poor marketing

X_3 = High cost of human labour

X_4 = Inadequate extension services

X_5 = Lack of funds / credit facilities

X_6 = High cost of transport to urban centres.

3.0 RESULTS

Table 2 shows that 20.1% of the respondent spend less than five year on their farmland while 33% have been cultivating this farmlands between 5-10 years and 35.8% between 11-15 years respectively. Similarly, 6.4% of the respondents have been cultivating their farmlands between 16-20 years while 4.6% the respondents have been on their farmlands for over 10 years. The bulk of people living in the study area are farmers who produce food crops commonly cultivated in the study area. They include yam, cassava, groundnut, guinea corn, maize, millet (Plate 1 and 2). Others are vegetables fruits and soya beans. The table further shows that a large number of farmers plant all types of food crops commonly cultivated in the study area. They include yam, cassava, groundnuts, guinea corn, maize, millet (Plate 2). Others are vegetables, fruits and soya beans. The table further shows that a large number of farmers plant all types of crops under mixed cropping (Plate 1). Evidence suggests that farmers enjoyed a number of advantages from this practice. Such advantages include increased yields, better labour utilization, prevention of erosion and maintenance of soil fertility at low levels of productivity. Table 3 shows farm size among the respondents, with patrilinear system, the men with their unmarried sons (and in some cases married sons) can cultivate between 3-4 acres of land annually. Despite this, most farmers combine hired labour with family labour and can thus cultivate as high as above 5 acres annually. At other times, different age groups organize themselves in “association farming” whereby they rotate the working days with each other’s farm in turns, this was also observed by Olawepo (2010). Thus, its effect has far reaching impact on the

124 farms. Table 3 further shows the average acre cultivated less than 1 acre, 26.76% cultivated between
125 1-2 acres, 26.3% cultivated between 2.1 to 5 acres. In order to measure the contribution of each of
126 the constraints to the variation in the total agricultural productivity in the study area, the multiple
127 regression model (Table 4) shows that a strong positive relationship exists among the variables
128 tested. This is an indication that all the constraints listed by the respondents are cordially related thus
129 having negative impact on the agricultural productivity in the study area. From the regression table, it
130 is observed that high cost of human labour (X_3) is perhaps the mostly felt constraint to increased food
131 production, followed by high cost of transportation (X_6), inadequate extension services (X_4), lack of
132 funds/ credit facilities (X_5), lack of modern equipments (X_1) and poor marketing (X_2) with the
133 coefficient of determination (R^2) of 0.82, 0.8, 0.78, 0.72, 0.64 and 0.58 respectively. Adebayo (1995)
134 reported that there is wide spread exodus of able bodied men from the rural areas to the urban
135 centres, leaving the old who cannot stand the rigor of traditional farming. This often leads to high cost
136 of labour change by the itinerant labourers/ farmers who are majorly the TIVs, Idoma and Igalas from
137 Benue state, and the Ebiras from Kogi state of Nigeria. Similar findings were observed by Olawepo
138 (2010) who reported a positive relationship in the constraints affecting agricultural productivity in
139 Kwara state, Nigeria. The equation obtained is in this form:

140 $Y= 3.16 + 0.03\ X_1 - 3.21\ X_2 - 2.92\ X_3 + 1.54\ X_4 + 3.09\ X_5 + 2.11 X_6.$

141 From the regression equation, poor marketing and high cost of human labour gives a negative
142 coefficient. Hence, their coefficient of determination (R^2) were found to be relatively high (0.58 and
143 0.82 for poor marketing and high cost of human labour respectively). This is an indication that these
144 two factors greatly affect the agricultural productivity in the study area. However, lack of modern
145 farming equipment, inadequate extension service, lack of funds, credit facilities and high cost of
146 transportation gives a positive coefficient with coefficient of determination of 0.82, 0.78, 0.72, 0.64 and
147 0.58 respectively. This is an indication that their impacts are greatly felt in agricultural productivity in
148 the study area (Olawepo, 2010).

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Table 1: Population size of selected communities surrounding the Kainji Lake National Park

District	Villages	Population
Wawa	Gada Olli	10,050
	Sabon Kadi	5,000
	Leshibe	2,500
Babanna	Kubli	6,000
	Kwasure	4,000
	Garuji	693
Zugurma	Patiko	4,000
	Muliya	3,500
	Faje	4,200
Kemeji	Tenebu	3,000
	Nanu shugaba	6,000
	Bezira	2,800
Dekala	Gulbi	2,000
	Benya	3,580
	Bezhi	2,500
TOTAL		**59,823**

Source: Global Environmental Facility (GEF) World Bank Assisted Project.

Zone Communities as at 26th June, 2009.

155 **Table 2: Duration of Cultivation on Farmland**

Districts	Villages	Below 5 yrs	5 – 10 years	11 – 15 years	16 – 20	Above 20
Wawa	Gada Oli	8	6	12	3	1
	Sabon kadi	4	16	8	5	0
	Leshibe	2	14	6	2	3
Babanna	Kubli	6	12	8	2	1
	Kwasure	8	14	10	0	3
	Garuji	0	10	16	1	1
Zugurma	Patiko	2	16	12	0	1
	Muliya	4	8	16	3	2
	Faje	8	8	10	1	2
Kemije	Tenebu	10	6	12	3	0
	Nanu Shugaba	8	6	2	1	0
	Bezira	0	8	12	1	0
Deakala	Gulbi	6	12	8	4	2
	Benya	14	6	16	0	1
	Bezhi	8	2	10	2	3
Total		88 (20.1%)	144 (33.0%)	156 (35.8%)	28 (6.4%)	20 (4.6%)

156 Source: Author's work, 2011.

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158 **Table 3: Size of farmland in the study area (Acre)**

Districts	Villages	Size in Acres			
		Less than 1	**1-2**	**2.1-5**	**Above 5**
Wawa	Gada Oli	2	3	5	1
	Sabon kadi	3	4	3	2
	Leshibe	6	2	4	1
Babanna	Kubli	4	5	3	3
	Kwasure	3	2	4	2
	Garuji	7	6	4	3
Zugurma	Patiko	4	4	1	2
	Muliya	5	5	5	3
	Faje	3	3	4	4
Kemije	Tenebu	6	5	3	3
	Nanu Shugaba	5	4	4	2
	Bezira	4	3	6	3
Deakala	Gulbi	2	2	4	1
	Benya	5	6	3	3
	Bezhi	6	3	3	2
Total		**65**	**57**	**56**	**35**
Total (%)		**30.50**	**26.76**	**26.30**	**16.44**

159 Source: Author's work, 2011.

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Table 4: Stepwise multiple regression results for the agricultural constraints

Variables	Parameter estimates	Standard Error	R	R^2	% Change	% Cumm.
Intercept	3.16	0.25				
X_1	0.03	0.01	0.87	0.64	-	64
X_2	-3.21	0.41	0.65	0.58	-6	58
X_3	-2.92	1.02	0.90	0.82	24	82
X_4	1.54	2.21	0.86	0.78	-4	78
X_5	3.09	1.29	0.77	0.72	-6	72
X_6	2.11	1.63	0.89	0.80	8	80

Source: Author's work, 2011.

X_1= Modern farming equipment

X_2= Poor marketing

X_3= High cost of human labour

X_4= Inadequate extension services

X_5= Lack of funds/ credit facilities

X_6= High cost of transport to urban centres

Plate 1: Mixed Cropping Cultivation

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178 **Plate 2: Millet Cultivation**

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4.0 CONCLUSION

There exists a high level of agricultural constraints which has a profound effect on productivity within Kainji Lake National Park (KLNP), with high cost of human labour having the most significant impact and poor marketing being the least constraint to agricultural productivity in the study area. The knowledge of these constraints will further assist in providing solutions that will improve agricultural productivity in (KLNP).

5.0 RECCOMENDATIONS

- There is need for the government to review the existing laws as it relate to accessibility to protected lands by members of the community. This is important to resource sustainability in Nigeria as majority of it's citizens needs to know the reasons for conserving and sustaining the existing natural resources.
- Education among the neighbourhood should be realistically encouraged. This would not only lead to better perception but also create opportunity for awareness of realistic coping, strategies.
- Demarcation of the protected areas should also be well defined by the government to the communities.

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