

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 [in KLNP](#), 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 consist](#) three villages [resulting into totalling](#) 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. Malthus 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 ([Reference](#)). 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

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

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

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

64 In Nigeria, there has been an increase in the number of conflict vis-à-vis conservation and
65 natural resources protections. The Kainji conservation for example has been extending its services on
66 the natural ecosystem in the last one decade. This has resulted in the increase in number of conflicts
67 between wildlife operations, farmers and the communities at large. The basic question still remains;
68 What are the constraints to agricultural productivity within the Kainji Lake National Park
69 (KLNP)?
70

71 2.0 MATERIALS AND METHODS

72 Data [are](#) obtained from both primary and secondary sources. The primary source of data [werewas](#) of
73 two types. First, questionnaires were prepared and used to collect information on agricultural
74 practices and productivity [from](#) the residents around KLNP in order to get firsthand information.
75 Secondly, interviewing method was employed. The study area (KLNP) has a total population of about
76 59,823 (Table 1) as compiled by the Global Environmental [facility Facility](#) (GEF) World bank assisted
77 project as [atin](#) June 2009.

78 **2.1. The interview method:** Key National Park officials were also interviewed on the [attitude](#)
79 [ofattitude of](#) the farmers as it relates to conservation policies.

80 **2.2. Field observation:** this was adopted to explore actual human activities and the farming
81 system employed in and around the park by direct observation.

82 **2.3. Informal discussion method:** the people were engaged in informal discussions and
83 notes were taken.

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

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

94
$$Y = a + b_1X_1 + b_2X_2 + \dots + b_n X_n + e$$

95 Where Y = acre

- 96 a = Intercept
- 97 b_1, b_n = parameter estimates
- 98 e = standard error
- 99 X_1 = Lack of modern farming equipments
- 100 X_2 = poor marketing
- 101 X_3 = High cost of human labour
- 102 X_4 = Inadequate extension services
- 103 X_5 = Lack of funds / credit facilities
- 104 X_6 = High cost of transport to urban centres.

105 3.0 RESULTS AND DISCUSSION

106 Table 2 [shows2 shows](#) that 20.1% of the respondent spend less than five [yearyears](#) on their
 107 farmland while 33% have been cultivating [this their](#) farmlands between 5-10 years and 35.8%
 108 between 11-15 years respectively. Similarly, 6.4% of the respondents have been cultivating their
 109 farmlands between 16-20 years while 4.6% the respondents have been on their farmlands for over 10
 110 years. The bulk of people living in the study area are farmers who produce food crops commonly
 111 cultivated in the study area. They include yam, cassava, groundnut, guinea corn, maize, millet (Plate
 112 1 and 2). Others are vegetables fruits and [soya beanssoybean](#). [The tableTable 2](#) further shows that
 113 a large number of farmers plant all types of food crops commonly cultivated in the study area. They
 114 include yam, cassava, groundnuts, guinea corn, maize, millet (Plate 2). Others are vegetables, fruits
 115 and soya beans. The table further shows that a large number of farmers plant all types of crops under
 116 mixed cropping (Plate 1). Evidence suggests that farmers enjoyed a number of advantages from this
 117 practice. Such advantages include increased yields, better labour utilization, prevention of erosion
 118 and maintenance of soil fertility at low levels of productivity. Table 3 shows farm size among the
 119 respondents, with patrilinear system, the men with their unmarried sons (and in some cases married
 120 sons) can cultivate between 3-4 acres of land annually. Despite this, most farmers combine hired
 121 labour with family labour and can thus cultivate as high as above 5 acres annually. At other times,
 122 different age groups organize themselves in "association farming" whereby they rotate the working
 123 days with each other's farm in turns, this was also observed by Olawepo (2010). Thus, its effect has

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

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

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

150 **Table 1: Population size of selected communities surrounding the Kainji Lake National**
 151 **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

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

153 Zone Communities as at 26th June, 2009.

Comment [KN(1)]: Almost 20 years old figures.
Can you get a more recent one?

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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	8	6	2	1	0
	Shugaba					
Deakala	Bezira	0	8	12	1	0
	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.

157

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	5	4	4	2
	Shugaba				
Deakala	Bezira	4	3	6	3
	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

Source: Author's work, 2011.

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162 **Table 4: Stepwise multiple regression results for the agricultural constraints**

<u>VariablesAgricultural</u> <u>constraints</u>	Parameter estimates	Standard Error	R	R²	% Change	% Cumm.
Intercept	3.16	0.25				
<u>Modern farming</u> <u>equipmentX₁</u>	0.03	0.01	0.87	0.64	-	64
<u>Poor marketingX₂</u>	-3.21	0.41	0.65	0.58	-6	58
<u>High cost of human</u> <u>labourX₃</u>	-2.92	1.02	0.90	0.82	24	82
<u>Inadequate extension</u> <u>servicesX₄</u>	1.54	2.21	0.86	0.78	-4	78
<u>Lack of funds/ credit</u> <u>facilitiesX₅</u>	3.09	1.29	0.77	0.72	-6	72
<u>High cost of transport to</u> <u>urban centres</u> X₆	2.11	1.63	0.89	0.80	8	80

163 Source: Author's work, 2011.

164

165 **X₁= Modern farming equipment**

166 **X₂= Poor marketing**

167 **X₃= High cost of human labour**

168 **X₄= Inadequate extension services**

169 **X₅= Lack of funds/ credit facilities**

170 **X₆= High cost of transport to urban centres**

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Plate 1: Mixed Cropping Cultivation

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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 [relaterelates](#) 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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