



Conflicts and Forest Land-Use: A Case Study of Forest Reserves in Ogun State, Nigeria

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Abstract

The study examined the clash of interests between custodians of government Forest Reserves (FRs) in Ogun State and farmers operating within them. Information on the causes and effects of these clashes would better inform policy makers and forestry professionals on workable and sustainable land-use practice. Therefore, factors responsible for such conflicts and their effects were investigated through questionnaire administration to elicit the views of 750 randomly selected farmers from 72 enclaves. This represents 30% of the total number of enclaves in the nine FRs in the State. In addition, 30% of staff of the State Ministry of Forestry and Ministry of Agriculture (72 and 32 respectively) were randomly selected for questionnaire administration. Furthermore, 30% (32) of the timber contractors operating within the FRs were randomly selected for interview using an interview schedule. Data were collected on existence, causes and effects of conflicts and extent of land hunger. Secondary data were obtained from journals and reports from the State Ministry of Forestry. Data were analyzed using descriptive statistics and logit model at $p < 0.05$. Among the farmers, descriptive statistics revealed that 74.3% had unauthorized access to FRs, 68.1% were resident within FRs while 55.4% utilized lands approved by government for farming. Also, results of logit regression analysis revealed that the location of FRs where farmers operate (odds ratio = 2.39), rights of farmers to use forestland for farming (odds ratio = 2.19) and farm size (odds ratio = 1.52) are factors that are likely to cause conflicts over the use of forest lands in Ogun state. Furthermore, analysis of timber contractors' response revealed that, 72.6% identified destruction of cash crops during timber exploitation as cause of conflicts between them and farmers. State Ministries of Forestry and Agriculture officials identified loss of forests (27% and 25.2%), tree species (25.5% and 24%) and lives (22.5% and 22%), as effects of conflicts in the FRs. Conflicts in the use of forest land ensued between farmers and timber contractors on one hand and farmers and forest custodians on the other. The existence of land hunger in the forest reserves host communities and unauthorized access to forest land encouraged activities engendering conflicts over the use of forest land.

Keywords: Land-use conflicts, Forest policy, Forest reserves, Land hunger

Introduction

Different authors have specific definitions for conflict. Some defined it according to the context of the issues in question. According to Schmid (1998), conflict is the situation where two or more parties perceive their interests as incompatible and express hostile attitudes or pursue their interest through actions that damage other parties. Fisher *et. al.*, (2000) defined conflicts as a relationship involving two or more parties who have, or perceive to have, incompatible interests or goals. FAO (1998) referred to land conflict as a natural phenomenon that refers to the legitimate but opposing interests, activities and impacts on the environment resulting from the different goals and objectives of the many groups and individuals involved or affected by the use and exploitation of land.

Conflict over natural resources such as land, water and forest is ubiquitous (Anderson *et al.* 1996; Ayling, 1997). Societies everywhere have competed for natural resources to enhance their livelihoods. Therefore, several authors have defined conflicts based on the study context and among them is Schmid (1998) who refers to conflict as the situation where two or more parties perceive their interests as incompatible and express hostile attitudes or pursue their interest through actions that damage other parties.

According to WWF/IUCN (2002) agricultural production and forest conservation are vital natural resources in the rural land use development and are closely integrated with each other in a long history of human civilization. However, the promotion of one often leads to destruction of the other. Higher agricultural production improves farmers' well-

being as well as higher economic growth (World Bank, 1991; Angelsen and Kaimowitz 2001). In support of this statement, Agbeja, (2006) stated that the revenue accruing from the Nigerian forests contribute substantially to the National Gross Domestic Product and sustenance of the livelihood of the people. On the other hand, there is international concern about the adverse consequences of tropical deforestation resulting from forest clearing which contribute to climate change, biodiversity loss, reduced timber supply, flooding and soil degradation that in turn affect economic activity as well as people's livelihoods. In Nigeria, the situations on conflicts between agriculture and forestry land uses and its consequent causes and effects are not different from what Angelsen and Kaimowitz (2001) stated. These have been re-echoed in many studies such as Zhaohua (1991); Smith (1994); Inkoom (1999); Reardon and Barret (2001); and Marfo (2006). They stated that land use conflicts mostly are caused by single or combination of factors. Among key factors pointed out are land hunger, poverty, demand for land for farming, unsustainable farming practices, unfair benefit sharing, ownership rights and control, inappropriate policies, poor management, weak cross-sector harmonization and high population growth.

For instance, the population of Nigeria is over one hundred and forty million people (NPC, 2007), therefore, the need to produce enough food is perhaps one of the most pressing of the various challenges facing the country. This is pertinent, if the Federal Governments' is to achieve its desire to achieve agricultural sustainability by the year 2020. Another concern centres on the growing demand for wood products, with the need to increase the productivity of the land which carries the forests as well as the desire to use forest as one of the bases of industrial development. This may be achieved through massive forest regeneration for fibre production as well as conservation, while not neglecting the education of all concerned stakeholders.

In Ogun State, the factors fuelling forest land use conflicts amongst forest land users are very diverse and often lead to loss of lives and properties, (government and individual) but unfortunately these factors are not scientifically

documented. This study therefore seeks 'in part' to identify these factors with a view to unveiling possibilities of prospects for reconciling the conflicting sectors.

Failure of Ogun state to effectively manage the land use systems in its forest reserves has led to several conflicts. As the demand to meet the agricultural needs of the state increases, so does the demand on forestland for this purpose intensifies. The need therefore arises for the state to have a system of forest land use and tenure arrangement that will accommodate the need of all stakeholders with interest in forest land use with a view to eliminating or drastically reducing the prevailing conflicts as a result of forest land use.

Land hunger has been one of the major problems causing conflicts between agricultural and forestry land uses in Ogun State. The scarcity of land which exist as a result of shortage in supply to meet the increasing demand for land outside forest reserves to accommodate development, make farmers without secure rights of access to land see the reserves as a favourable alternative in view of the ease of access. A clear knowledge of the extent of land hunger in the state forest reserves is presently lacking. This study will therefore help to gain insight into this issue and assist in proffering intervention programmes or processes to amend the situation.

To date, in spite of the numerous incessant conflicts that occur among forest land users in Ogun State forest reserves, there is no detailed documentary evidence on the causes of these conflicts. Generating baseline information on the causes of these conflicts will provide a window of opportunity to reconcile the sectors.

Thousands of rural people in Ogun state practice subsistence agriculture. They reside within and around the forest reserves that have since been gazetted. As access to privately owned land reduces, the farmers rely more on the remaining government land for food, fuel, shelter and cash incomes. However, the first and continuing challenge facing the state agriculture is to produce enough food to feed the growing population. This goal can only be attained especially when there is a consensus between agriculture and forestry land-uses as a prerequisite for sustainable land management.

This study is therefore appropriate and compelling, in view of the conflicts that had often emanated between the forestry administrators and rural farmers, on land within and around the forest reserves in Ogun state without appropriate corresponding interventions that could have brought prospects for reconciliation some years back.

Methodology

Study Areas

The nine forest reserves (FRs) in Ogun State were selected for the study. These were: Arakanga, Aworo, Edun Stream, Eggua, Ilaro, Imeko Game, Ohumbe, Olokemeji, and Omo (Areas J1, J3, J4 & J6).

Ogun State lies within latitude 7°N and 6°N and longitude 2.5° E and 5° E . It is a state in South-western Nigeria. It is bordered by Lagos State to the South, Oyo and Osun states to the North, Ondo State to the east and the republic of Benin to the west. The state has a total land area of 16,762 km² (Oyesiku and Kojeku, 1992) out of which a total of 2,731.62km² constitutes its forest reserves.

Data Collection

The instruments used for the data collection were structured questionnaire and interview schedule. This contained a uniform set of questions to which all respondents in a particular category were subjected, therefore making their views and opinions to be analyzed at the same level. The questionnaires were divided into parts and sections for clarity and for ease of understanding.

Each of the nine forest reserves was randomly stratified into two communities, 'within' and 'around' forest reserves. From each of these communities i.e. “within and around forest reserves”, 750 farmers, representing 30% of the farmers population was randomly selected by sampling based on probability proportionate to size from 72 enclaves, representing 30% of the total number of enclaves in the nine FRs in the state. In addition, 30% of field staff of the state Ministry of Forestry and Ministry of Agriculture (72 and 32 respectively) were randomly selected for questionnaire administration. Furthermore, 30% (32) of the timber contractors operating within the FRs were randomly selected for interview using a

schedule. There were feedback meetings to cross check information collected across stakeholders in the communities to ascertain the validity of the response.

Data Analysis

The data were analyzed using descriptive and inferential statistical tools. Descriptively, percentages and tables were used while Logit Regression was employed for inferential statistics.

Logit Regression Models

To identify factors that were likely to cause conflicts in the forest reserve, a discrete variable logit analysis was carried out. The opinion of the participants as to the existence of conflicts was framed as binary-choice models which assume that respondents were faced with a choice between two alternatives (e.g. existence of conflicts/nonexistence of conflicts) and the choice depended on identifiable characteristics. The estimation form of logistic transformation of the probability of participants’ opinions on the existence of conflicts can be represented as:

$$P' = b_o + b_1X_1 + b_2X_2 + \dots + b_nX_n \dots\dots\dots 1$$

Where: P' = Land Use Conflicts between forestry and agriculture in Ogun State

b_o, b₁, b₂ b_n = regression parameters (a vector of unknown parameters).

X₁ X₂ X_n = factors responsible for conflicts in study area (a vector of explanatory variables).

However, in order to estimate the parameters of the variables influencing the occurrence of conflicts in the forest reserves, maximum likelihood estimation was used as shown in equation (2) below.

$$P' = b_o + b_1(NATV) + b_2(HHS) + b_3(FD) + b_4(LD) + b_5(FS) + b_6(FLAV) + b_7(VL) \dots\dots\dots (2)$$

where:

NATV = a dummy variable indicating whether the farmer is a native of the area or not;

HHS = a dummy variable indicating whether the household size is big or not;

FD = a dummy variable indicating whether the farmer had been operating within the

reserve for over ten (10) years or not;
 LD = a dummy variable indicating whether the land being used by the farmer was officially demarcated or not;
 FS = a dummy variable indicating whether the farmer had exceeded the approved farm size or not;
 FLAV = a dummy variable indicating whether farm land is available in the farmer's location or not;
 VL = a dummy variable indicating whether the farm village is located within the forest reserve or not;

Variables used in the model

The Outcome variable: The outcome variable is existence of conflicts, which is coded with the value 1 to indicate the farmer's opinion on existence of conflicts and zero otherwise.

Independent variables: It is assumed that the factors listed in Table 5 may likely influence occurrence of conflicts and thus the factors were included in the model as independent variables

Given the above hypothesized factors of farmers' opinions on the existence of conflicts, using the binary logistic models which are very useful in situations where the dependent or response variable is binary in nature, implies that they can have only two possible values. The models therefore describe the relationship between one or more continuous independent variable(s) to the binary dependent variable. The two common binary models are the logit and probit (Ostle, 1963). The logit model is particularly preferred because of the unique information it provides. The distinct information provided by logit is the odds ratio. This is defined as the ratio of the odds of an event occurring in the group to the odds ratio of it occurring in another group (Deeks, 1996). Logit also provides information on the consequences of one variable on the other. Hence, it clearly indicates the variable(s) that mostly cause conflict between forestry and agricultural land uses.

Population Density Analysis

As recorded by King (1968), land hunger occurs if the reserved areas of high forest are subtracted from the total areas of the host communities, the population density with respect to available land outside the reserves

increases considerably and becomes extremely high. Therefore, Population Density analysis is represented as follows:

$$\text{Population Density (Before Reservation)} = \frac{\text{Population of Host Community (Before Reservation)}}{\text{Land Area of Host Community before Reservation}}$$

$$\text{Population Density (After Reservation)} = \frac{\text{Population of Host Community (After Reservation)}}{\text{Land Area of Host Community after Reservation}}$$

Results and Discussion

Factors Fuelling Conflicts between Forestry and Agricultural Forest Land Uses in Ogun State.

Observations from this study revealed that Farmers Activities within the Forest Reserves which were greatly influenced by their understanding of the importance of forests and right to use forestland for farming were major factors fuelling conflicts in the study area.

Out of the 750 farmers who responded to the questionnaires, 9.5% perceived the importance of forests to them as; for timber production only, while 9.2%, 7.2% and 1.0% of the farmers perceived forest importance to mean: revenue for government only, food and meat only and land bank only, respectively. This exhibition of limited knowledge of the importance of forests to man is very disturbing as it implies that the farmers are primarily driven by the zeal to meet their economic needs. This therefore indicates that Ogun State is fast moving in the same direction Ondo State moved until farmers who badly damaged gazetted forests in the State were dislodged as indicated by Akinola, (2006). Seventy four percent of the farmers believed that the factor granting them the authority to farm in forest reserves in the state was the forestry law, while 5.6% and 0.5% believed that they are there at the instance of the Chief's authority and Land-owning rights respectively. It is a common feature however, for farmers to gain access to forestland for agriculture through village Chiefs who allocate the land to them for a fee; this is evident from the series of field reports forwarded to the headquarters on this account. Their claim of

legal right to use forestland without permission; believing that they are empowered to do so by the authority of the forestry law, paint a gloomy future for forestry in the State if their current perception persists. Furthermore, it is very disturbing to note the claim by majority of the farmers to be engaged only in the planting of food crops, when in actual fact, this is contrary to common knowledge of the activities of many of them who are noted to engage in the planting of perennial tree crops (cocoa) and obtain their portion of the forestland through subcontracting.

Extent of Land Hunger among Farmers in the Study Area

This objective was addressed using the following factors:

Fallow-Land Availability within Forest Reserves

Seventy-three of the farmers claimed that there was existence of fallow-land in the forest reserve where they operated, while the remaining 27.0% claimed that there wasn't any available fallow-land. This result indicates that there was existence of fallow land in most of the forest reserves in Ogun State.

Scarcity of Land within Forest Reserves

Observations revealed that 30.4% of the farmers believe that land scarcity is caused by increase in the population of farmers only, 16.1% believe that it is caused by the fixed area of the forest reserves only, while 3.3% and 17.2% believe that the scarcity is caused by an expansion in the total land area cultivated by each farmer and other factors respectively. The remaining 33% of them believe that varying combinations of these factors causes it. According to this result, forest degradation as a result of encroachment will persist in Ogun State as the population of farmers increase and the total land area cultivated by each of them expand.

Incentives for Encroachment into Forest Reserves

Some of the farmers believed that the main factor encouraging encroachment of forestland for agricultural purposes in Ogun State was easy accessibility to the forestland (14.30%), while 12.3%, 9.1%, 2.3% and 1.2% of them responded that it was as result of; Good soil fertility, Unavailability of fallow-land outside the forest reserves, Land owning right

and Given by chief only (i.e. Allocation of farmland to farmers by community head), respectively. The remaining 60.8% believe that varying combinations of these factors were responsible. This result corroborates the farmers' response on scarcity of land within forest reserves and implies that forest degradation as a result of encroachment will definitely persist in Ogun State if urgent pragmatic steps are not taken to address the compelling circumstances.

Existence of Conflicts within Forest Reserve

Sixty three percent of the farmers claimed non-existence of conflicts in the forest reserves where they operated, while 37.0% admitted that there were existing conflicts. This result agrees with the response of farmers on the existence of fallow land in the forest reserves where they operated; which implies that the more the fallow land available within a particular reserve, the less likely will be the occurrence of conflicts as a result of forest destruction regardless of the existence of encroachment cases.

Timber Contractors' Views on Farmers Tenancy

Conflicts between timber contractors and farmers on the destruction of economic trees remain one of the most rampant types of conflicts in the Omo forest reserve that may persist for a very long time unless immediate measures are taken to make corrections. As revealed by this study, 98.0% of the 32 timber contractors interviewed were of the opinion that farmers involved in the planting of cocoa and other perennial cash crops within the reserves should be ejected and their farms destroyed in view of the constraint they pose to further forest establishment. The remaining 2.0% said they could be left to remain, they would not establish fresh cash crop plots.

Provided Population Density Estimates as an Indicator of Land Hunger

Using King (1968) analysis of average population densities of communities within and around forest reserves after reservation, observations from this study clearly indicated that land hunger existed in both Arakanga forest

reserve and Omo forest reserve. Data from tables 2, 3 and 4 were used to demonstrate this. For Arakanga Forest Reserve (FR), only 0.3% of the Abeokuta North LGA total land area was reserved to create the fuel wood plantation (Table 2.). Therefore, the resultant land area of the Abeokuta North LGA after reservation was 99.6% with this resulting in an average population density of 182.8 as against 182 before reservation (Table 3.).

However, all farmers who responded to the questionnaires claimed that there was no available fallow land within the reserve for agriculture (Table 4.). This assertion was found to be true by virtue of information obtained from the Ministry of Forestry which revealed that even though the reserve developed for fuel wood production, no exploitation of any form is allowed within the reserve let alone agricultural activities. This situation, no doubt was responsible for the local land hunger being experienced amongst farmers in the area. This is particularly so because of the contiguity of the reserve to the Abeokuta metropolis.

Similarly, 46.3% (about half) of two LGAs, Ijebu East and Ijebu North Local Governments' total land area was reserved to create the Omo forest reserve (Table 2.). Therefore, the combined percentage of the resultant land area of the two LGAs after reservation was 53.6% with this resulting in a sharp increase in the average population density to 185.1 as against 258 before reservation (Table 3.). However, farmers sampled through questionnaires responded that there was no fallow-land availability within the reserve i.e. Areas J1, J3, J4 and J6 (Table 4.). Therefore the land hunger experienced in this area is not surprising going by the unrepentant rate of the conversion of forestland to agricultural purposes. In more specific terms, the reserve is bedeviled by the planting of Cocoa, Plantain and Oil palm by farmers. Cases of forest encroachment at the Omo forest reserve date back to over a decade, but the situation had been compounded by the migration of farmers from neighboring States such as Ondo and Osun States. However, findings from this study revealed that 95.9% of the farmers involved in the conversion of forest land into cash crop

farming fields at the Omo FR were indigenes of Ogun State contrary to common public knowledge. The safe haven found in Ogun state was due to the active connivance of some self-seeking indigenous land owners who resorted to rent taking from the farmers with the support of corrupt government officials. This self-focused attitude has landed the state forestry sector in the mess it is today.

Prevailing Causes of the Conflicts in the Study Area

The following table shows the logistic regression model with 4 Independent variables. The results of the logistic regression analysis suggest that farmlands officially demarcated for farmers (*LD*) is significantly different from zero at 5% significance level of χ^2 value and has positive impact on the likelihood of the occurrence of conflicts in the study area. The odds-ratio indicates that areas (forest reserves) where land is not demarcated for farming are twice more likely to experience conflicts than areas with demarcated lands (Table 5). Areas with farm lands that have exceeded the approved farm size (*FS*) is significantly different from zero at 5% significance level of χ^2 value and has positive impact on the likelihood of the occurrence of conflicts in the study area. The odds-ratio indicates that areas with farmlands that have exceeded the approved farm size are twice more likely to experience conflicts than areas with farmlands that have not exceeded the approved farm size (Table 5). The availability of farmland/fallow land in an area (*FLAV*) is significantly different from zero at 5% significant level of χ^2 value and has negative impact on the likelihood of the occurrence of conflicts in the study area, demonstrating that availability of cultivable land in area does not influence farmers willingness to encroach (Table 5). The location of farmland used by farmers is significantly different from zero at 5% (*VL*) is significance level of χ^2 value and has positive impact on the likelihood of the occurrence of conflicts in the study area. The odds-ratio indicates that farmlands located within forest reserves are twice more likely to experience conflicts than farmlands located outside forest reserves (Table 5).

Table 1: Population, Land Areas and Average Population Densities of Local Government Areas (LGAs) in Ogun State

Local Government Areas	*Population	**Land Area (Km ²)	Average Densities (Km ²)
Abeokuta North	131,735	723	182
Abeokuta South	396,651	57	6,915
Ado-odo/Ota	328,961	885	372
Ewekoro	152,148	631	241
Ifo	172,392	487	354
Ijebu-East	85,686	1985	43
Ijebu-North	207,969	969	215
Ijebu North East	83,761	124	673
Ijebu-Ode	191,008	209	913
Ikenne	90,054	137	657
Imeko/Afon	93,114	1711	54
Ipokia	196,504	576	341
Obafemi-Owode	192,154	1430	134
Odeda	125,466	1547	81
Odogbolu	143,789	568	253
Ogun Waterside	86,811	860	101
Remo North	66,582	195	342
Sagamu	224,500	640	351
Yewa North	227,888	2043	111
Yewa South	181,891	585	311

Source: Ogun State Health Bulletin (Vol.1) 2004

* Populations figures courtesy National Population Commission (Projections from 1991 Population Census)

** Land Area Courtesy, Ogun State Bureau of Survey

Table 2: Percentages of Reserved Land area for each Forest Reserve within their Host Local Government Areas in Ogun State Nigeria

Local Government Areas		Forest Reserves		Percentage Of Reserved Land Area (%)
Names	Land Area (km ²)	Names	Land Area (km ²)	
Abeokuta North	723	Arakanga	2.39	0.3
Odeda	1547	Olokemeji	58.88	3.8
Ijebu East and Ijebu North	2954	Omo (J1,J3,J4 and J6)	1368.06	46.3
Yewa South	585	Ilaro	46.08	7.8
Yewa South	585	Edun Stream	0.79	0.1
Yewa North	2043	Aworo	212.99	10.4
Yewa North	2043	Eggua	41.47	2.0
Yewa North	2043	Ohunbe	46.08	2.2
Imeko/Afon	1711	Imeko Game	954.88	55.8

Source: Field Survey (2006)

Table 3: Resultant Average Population Densities of Each Local Government Area (LGA) Hosting Forest Reserves after Reservation

Forest Reserves	Local Govern ment Areas	Land Areas of LGAs Before Reservatio n (km ²)	Land Areas Of LGAs After Reservation (km ²)	Population of LGAs	Percentage of Resultant Land Area After Reservation	Average Population Densities Before Reservation	Average Population Densities After Reservation
Arakanga	Abeokuta North	723	720.6	131,735	99.6	182	182.8
Olokemeji	Odeda	1547	1488.1	125,466	96.1	81	84.3
Omo Areas J1,J3,J4 and J6	Ijebu East and Ijebu North LGAs.	2954	1585.9	293,655	53.6	99	185.1
Ilaro	Yewa South	585	538.9	181,891	92.1	311	337.5
Edun Stream	Yewa South	585	584.2	181,891	99.8	311	311.3
Aworo	Yewa North	2043	1830.0	227,888	89.5	111	124.5
Eggua	Yewa North	2043	2001.5	227,888	97.9	111	113.8
Ohunbe	Yewa North	2043	1996.9	227,888	97.7	111	114.1
Imeko Game	Imeko/Afon	1711	756.1	93,114	44.1	54	123.1

Source: Field Survey (2006)

Table 4: Farmers responses to the Availability of Fallow Land within Their Respective Communities/Forest Reserves

Forest Reserves	Total Number of Respondents	Missing	Count on options		Percentage	
			No	Yes	No	Yes
Arakanga	39	0	39	0	100	0
Olokemeji	91	0	33	58	36.27	63.74
Omo Areas J1	18	0	18	0	100	0
J3	38	0	38	0	100	0
J4	43	0	43	0	100	0
J6	34	0	34	0	100	0
Ilaro	200	0	191	9	95.50	4.50
Edun Stream	35	0	35	0	100	0
Aworo	49	0	49	0	100	0
Eggua	48	0	42	6	87.50	12.50
Ohunbe	58	0	53	5	91.38	8.62
Imeko Game	97	0	0	97	0	100
TOTAL	750	0	575	175		

Source: Field Survey (2006)

Table 5: Logistic Regression Analysis

Dependent Variable: Existence of Conflicts (Presence =1; Absence =0)

Independent variable	Coefficient	Standard error	Odds-ratio
Whether the land being used by the farmer was officially demarcated (LD)	.785	.317	2.19*
Whether the farmer had exceeded the approved farm size (FS)	.419	.068	1.52*
Whether there is farm land availability in the farmer's location (FLAV)	-1.959	.362	.140
Whether the farm village is located within the forest reserve (VL)	.869	.261	2.39*
Constant	-2.075		
Model χ^2	124.01		

Note. P < 0.05 *

(ii) The following table shows the logistic regression model with 3 independent variables. The results of the logistic regression analysis suggest that the nativity of the farmer (NATV), house hold size (HHS) and farming duration (FD) are significantly different from zero at 5% significance level of χ^2 value and has negative impact on the likelihood of occurrence of conflicts in the study area (Table 6).

Table 6: Logistic Regression Analysis

Dependent Variable: Existence of Conflicts (Presence =1; Absence =0)

Independent variable	Coefficient	Standard error	Odds-ratio
Whether the farmer is a native of the area (NATV)	-1.158	.764	.314
Whether the household size is big (HHS)	-.011	.040	.988
Whether the farmer had been operating within the reserve for over ten (10) years (FD)	-.015	.013	.984
Constant	-.941		
Model χ^2	61.71		

Note. P < 0.05 *

Logistic regression analysis indicated that the official demarcation of land for farming

or otherwise is a significant factor that determines the occurrence of conflicts in the

forest reserves. This is because it presents a clear indication of the authority upon which the farmer is using the forestland for farming. Similarly, the size of farms cultivated by farmers is a function of their adherence to agreement reached with government on farm size which aggregates to 60 hectares per enclave. Exceeding the approved farm size means farmers are moving beyond their approved boundaries. Not only does this lead to conflicts, it is also an indication of the inefficient monitoring of farming activities within the forest reserve. The location of village used for farming (within or outside forest reserves) is another significant factor indicating encroachment and thereby resulting in conflicts in the study area.

Government Officials' Responses on the Causes of Conflicts

Forestry Staff

All the forestry staff sampled agreed to the existence of forestland encroachment cases in the State's Forest Reserves as well as the existence of conflicts in forest land-use by farmers. They however were of the opinion that the causes of the conflicts were: inadequacy of the state forest policy only (11.1%), land hunger only (22.2%). However, (33.3%) of them said it was due to a combination of inadequacy of the state forest policy, poverty and land hunger.

Agriculture Staff

On the other hand, 75.0% of agricultural staff was aware of existing cases of forestland encroachment. 20.0% of them said encroachment conflict cases were facilitated by connivance between farmers, villagers and forestry staff. Another 20.0% said conflicts were due to destruction of forest trees by farmers.

Timber Contractors Responses on the Causes of Conflicts

On the issue of conflicts, 72.6% of the timber contractors identified destruction of cash crops during timber exploitation as cause of conflicts between them and farmers.

Effects of Conflicts on Forestry Development in Ogun State

Ministries of Forestry and Agriculture officials' Responses on Effects of Conflicts State Ministries of Forestry and Agriculture officials identified loss of forests (27.0% and 25.2%), species (25.5% and 24.0%) and lives (22.5% and 22.0%), as effects of conflicts in the forest reserves.

Timber Contractors' Responses on Effects of Conflicts

Timber contractors' responses revealed the effects of the conflicts on forestry development as antagonism between timber contractors and farmers 65.5%, loss of species 20.0% and Loss of lives 10.2%. The remaining 5.3% believed that the effects were as a result of a combination of these factors.

The effects of conflicts on forestry development in Ogun state is unquantifiable, in terms of the human, biodiversity and economic losses incurred. Conflicts over natural resources have negative impacts. The various land-use conflicts occurring within and around the Ogun state forest reserves have led to irreparable losses. Illegal farmers are usually not interested in forest protection; therefore government loses its investment. The loss of re-investible revenue to the government, reduced level of trust among operators leading to hindrances in the smooth management of the reserves, and distortions in the accuracy of available records of recognized farmers are immeasurable.

In summary, the effects of conflicts caused by various factors identified are as presented below (Tables 7 and 8).

Table 7: Broad View of Causes and Effects of Agriculture and Forest Land Use Conflicts

S/N	Causes	Effects
1	High population growth	Expansion of farms & villages in Forest Reserves, Poverty
2	Reservation process	Land hunger
3	No national land use policy/plan, agriculture & out-dated & poor implementation of forest land use plans	Ineffective conflict resolution mechanism, Poverty
4	High demand of forestland for farming and mining	Land hunger, Increased degradation
5	Unsustainable agriculture practices and technologies	Increased degradation
6	Absence of conflict management strategies in agriculture and forest policies	Ineffective conflict resolution mechanism, Increased competition over land
7	Poor documentation & records of admitted farms /villages	Low food productivity, Decline in soil fertility
8	Poor cross-sectoral integration among land use sectors	Ineffective conflict resolution mechanism, Increased competition over land, Ineffective conflict resolution mechanism

Source: Field study (2006)

Table 8: Effects of Forest Land-Use Conflicts on Sustainable Forest Management in Ogun State

S/N	Types of Conflicts	Effects
1	Conflicts between groups of firewood extractors operating in the reserve	(i). Stagnation of operations resulting in loss of re-investable revenue to the government. (ii). Reduced level of trust amongst operators leading to hindrances in the smooth management of the reserves.
2	Encroachment into forestland through illegal subcontracting by farmers	(i). This leads to distortions in the accuracy of available records of recognized farmers. (ii). Illegal farmers are not interested in forest protection.
3	Illegal felling of trees	(i). Under-girth/ un-merchantable trees are usually involved leading to distortions in the ages of tree stands. (ii). Results in loss of revenue to the government.
4	Encroachment due to urban expansion	(i). Forest loss
5	Destruction of timber seedlings agricultural produce by grazing nomadic cattle	(i). Loss of investment to government. (ii). Leads to loss of replacement of felled trees. (iii) Loss of lives
6	Destruction of economic trees by illegal farmers to plant agricultural crops	(i). Loss of investment to government. (ii). Leads to loss of replacement of felled trees. (iii). Leads to reduced morale of timber contractors whose means livelihood is being threatened. (iv). Loss of lives
7	Illegal excavation of sand from the forest reserve	(i). Forest destruction
8	Erection of permanent building structures in the forest reserve	(i). Forest destruction
9	Illegal farmers utilizing forestland for agriculture	(i). Forest loss (ii). Leads to reduced morale of timber contractors whose means of livelihood is being threatened. (iii) Loss of lives
10	Destruction of agricultural and economic tree saplings by nomadic cattle	(i). Loss of investment to government. (ii). Leads to reduced morale of farmers whose means livelihood is being threatened.
11	Planting of permanent cash crops in some of the forest reserves	(i). Forest loss (ii). Leads to reduced morale of timber contractors whose means livelihood is being threatened. (iii).Results in loss of revenue to the government.
12	Illegal conversion of timber to charcoal	(i). Forest loss (ii). Loss of species (especially those useful in building construction).
13	Boundary disputes between contiguous communities claiming ownership of forest resources existing therein	(i). Forest destruction due to lack of sense of belonging of parties involved. (ii). Loss of lives

Source: Field study (2006)

Conclusion

The effects of the prevalent land use conflicts are far reaching and without boundaries. All stakeholders are affected and the implications on forestry development are daunting. An urgent appraisal of the conflicts and the implementation of intervention programmes is a must for the survival of the forestry sector in the state.

Recommendations

The following are recommendations for an effective management of the Ogun State forest estate;

- An enduring multiple land use system that will cater for the interest of all with interest in forest land use must be adopted for a sustainable forest land use.
- Alternative means of livelihoods for the inhabitants of forest communities must be seriously encouraged to tackle the problems of poverty that in-turn leads to forest degradation.
- Those who have been involved in some form of ecosystem services need to be compensated, in line with the Compensation for Ecosystem Services (CES) initiative, while others must be encouraged to follow this direction.
- Special attention must be given to areas currently faced with the challenges of land hunger while monitoring machinery are put in place to ensure that the consequences being encountered by areas currently experiencing it may be averted or ameliorated as the case may be.
- There must be political will secured to tackle the causes of the prevalent conflicts and to ensure that Forest policies and initiatives are respected.
- An effective conflict management mechanism must be adopted and pursued with all vigour.
- The Ogun State government should put measures in place to pragmatically address the effects of conflicts on forestry development in Ogun state. Government should therefore increase funding for forestry projects aimed at

fast-tracking forestry development in the state to mitigate these effects.

- To gain popularity for government policies and decisions, Stakeholders meetings must be organized and held for all stakeholders and all agreements reached must be binding and adhered to by all parties.

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