

Assessment of Community Participation in Forestry in Onigambari Forest Reserve

Chukwu, V. E. and Bada, S. O.

University of Ibadan, Nigeria, India

Abstract: This study investigated the degree of community participation in forestry among stakeholders of Onigambari Forest Reserve, Oyo State. Interviews and one hundred and sixty-seven structured questionnaires were employed with the view to gathering information from respondents that were drawn using both multi-stage and purposive sampling designs. The data were analysed using Descriptive and Chi-square test of independence statistics. Foremost among factors responsible for encroachment in the forest reserve is occupation, in which farming was identified as the most crucial. Other factors which affect health of the forest reserve include Sex, age, marital status, family size, literacy level, location of farm land; right to land, domestic fuel materials, activities carried out in the forest reserve, participation and involvement of the people in the management and implementation of programmes in the reserve, cooperation between the indigenous people and the officers of the reserve as well as perception of benefits derived from the reserve. Also, the indigenous people were not involved in the management and implementation of programmes in the forest reserve and that Oyo state policy is not effective in management of the forest reserve. However, sustainability of the forest reserve is dependent on its effective management, which has a strong bearing on the level of participation and involvement of the local people. Community participation in forestry which will reflect the needs of the people was therefore recommended as imperative to the survival of the reserve.

I. INTRODUCTION

Globally, degradation, fragmentation and simplification or conversion of forest ecosystems are progressing rapidly (Abramovitz, 1998). In Nigeria, forest area declined during the 1990s at an estimated annual rate of 2.6% (or 398,000 hectares per year (FAO, 2005), owing to agricultural expansion, encroachment, over-harvesting, bush burning, illegal harvesting and de-reservations. The Federal Department of Forestry (FDF, 2001) reported annual depletion rate of 3.5% in Nigeria. A detailed analysis of the land-use dynamics of Nigeria shows that even forests contributing to flood-plain agriculture (Fadama) and water resources development will eventually be depleted with potential catastrophic consequences. The FDF (op.cit) noted that the forest estate of Nigeria is highly depleted and that the Sahara Desert is encroaching southward at a rate of about one kilometer per year. Forest fires are common and are caused by deliberate burning. It was estimated that only about 975,000 hectares of forest reserves are productive, while another 2.34 million hectares of free (non-reserve) areas are only partially productive.

Deforestation rate in the southwest geopolitical zone is double the national average. Data on vegetation and land use changes between 1976 and 1995 reveal that the area covered by undisturbed forests in Nigeria decreased by 53.5% from 25,951sqkm in 1976 to 12,114sqkm in 1991 (FORMECU, 1998). For instance, in Ondo State, more than 44% of the 3,075sqkm of forest reserve has been lost in the last 30 years due to a combination of activities earlier mentioned. Bada (1999) also observed that over 11,300 hectares of forest were cleared annually in Omo forest reserve in Nigeria for the establishment of monoculture plantations of indigenous and exotic tree species.

The non-market products of the forests which include maintenance of biological diversity, regulation of local and regional climates, watershed protection, erosion control, regulation of stream flow and wind velocity, purification of air and water through absorption of Carbon dioxide must be conserved to ensure the sustenance of human life. However, ensuring that these goods and services are available for present and future generation requires their sustainable utilization. In other words, a sustainable and productive forest resource base can ensure enduring food and environmental security. But even though forest resources are renewable (i.e. regenerative), forest reserve degradation and deforestation pose the most formidable threats to forest resource base (WCED, 1987).

This alarming rate of depletion of resources of the forest implies serious ecological problem for the country and the world at large. The realization of downstream effects of flooding and soil erosion hastened by rapid fragmentation of forests and encroachment into forest lands is of great concern. This consciousness is heightened by the indispensable role of the forest in the livelihood of the overwhelming rural population of Nigeria. Local and foreign concessionaires looking forward to quick profit scarcely bother to consider the sustainability of the environment when logging. This often cause untold damage to suppressed species. Furthermore, the use of heavy machinery and hauling equipment can seriously expose the soil to damage and erosion more than can be tolerated. All the interwoven human activities in the forest as reported by Ngbanye (1998) have led to damages in the vegetation pattern of Nigeria where forest lands are being degraded into savanna, and savanna into desert.

Arnold (1992) claim that today's world is facing an unprecedented environmental crisis of which deforestation is

typical. The world is losing its forests at an alarming rate. All over the globe, many people now suffer from the destructive process that deprives them of the benefits from the natural resources on which they have always sustained their livelihood. The conservation of the World's forests requires the adoption of series of measures to change the current model of destruction. Now that both the direct and the underlying causes of forest degradation have been identified, the next step is to take the necessary measures to address them. At the same time, a new forest management model should be adopted that will ensure their conservation (Babalola, 2009).

In this respect, it is important to note that in most of the countries of the world, there are many examples of appropriate forest management, in which environmentally sustainable use is assured while benefiting local communities. Most West African states have initiated decentralization programmes, with devolution of natural resource management as an important component. Most national forestry services in the region now recognize the importance of community forestry, collaborative forestry, or joint forest management (JFM) and have developed a critique of previous practices based on exclusionary top-down approaches (Higman *et al.*, 1999).

Sarre (1992) noted that community forestry is a village-level forestry activity, decided on collectively and implemented on communal land, where local populations participate in the planning, establishing, managing and harvesting of forest crops, and so receive a major proportion of the socio-economic and ecological benefits from the forest.

Brender and Carey (1998) also identified three attributes of community forestry viz access to land and its resources by residents, residents' participation in decision-making concerning the forest as well as protection and restoration of the forest by the residents.

Community forestry provides an invaluable opportunity for the society in general and resource managers in particular to harness the knowledge of those living closest to the land towards developing a sustainable relationship with the forests. In partnership with these communities, a philosophy of resource use can evolve a system of social and cultural

restraints which is relevant to the demands imposed by today's technologies, population, and global economy. The efforts of forest-based rural development practitioners reflect the diverse ecological and economic circumstances of small communities across the country. These practitioners are engaged in a variety of enterprises, including ecotourism, non-timber forest products, watershed restoration, and value-added wood manufacturing networks. They believe in the potential of forestry as a tool for strengthening their communities, and even more importantly, that forest protection and economic development are inseparable goals (Brender and Carey, *op.cit.*).

It is worrisome that despite the geometric rise in population of Nigerian citizens on one hand and persistent decline in its forest resources on the other hand, there is hardly effective community forest management to protect and restore forest resources. This has created not just a gap in supply and demand; but has eaten deeper into the forest with dire environmental and economic consequences. As a result, it is essential, especially with little or inadequate literature exploring community participation in forest resources management, to assess the degree of community forest participation and its impact on forest health.

II. METHODOLOGY

Study Area

The study area is Onigambari Forest Reserve, Oyo state, which is divided into several series: Onigambari section, Busogboro, Onipe, Olonde, Dalli, Olowa, Sola, James Village, Isan, Ahori, Seriki, Abapan and Mamu. It lies within latitude 7° 23'N and longitude 3° 33'E, and covers an area of 11,618 hectares, between the river Ona on the West and the main road from Ibadan to Ijebu-Ode on the East (Figure 1). However, the Onigambari Forest Reserve, owned by Oyo state government was established on the 4th September, 1899 and consolidated in 1948. With the average altitude of the reserve lying between 122m to 152 m above sea level, its topography is more or less undulating. It has an annual rainfall of 1592.3mm with a relative humidity of 72 – 86.5% and a mean minimum temperature of 22.5°C (Akinyemi, 1998).

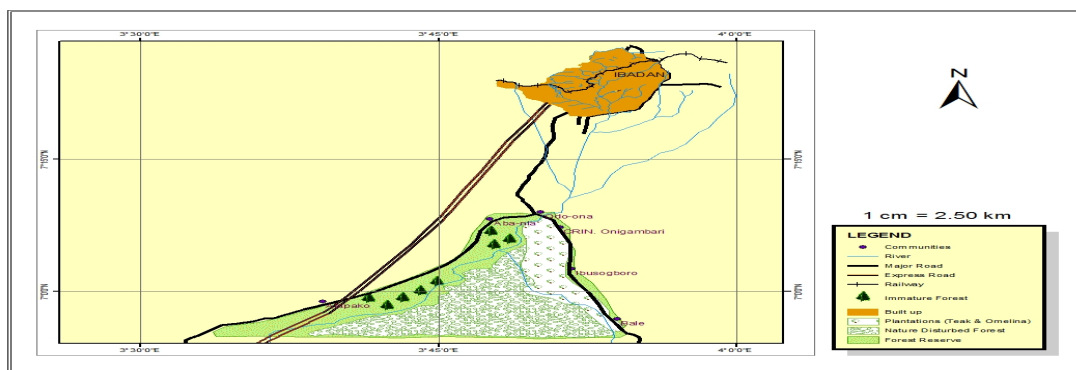


Figure 1: Map of Onigambari Forest Reserve showing land use and vegetation.

III. DATA COLLECTION AND ANALYSIS

Scheduled interview and structured questionnaires were used in collection of data. A random sampling was used in selection of five villages Onigambari Forest Reserve enclaves and surrounding settlements: Ibuso-gboro, Onipe, Gambari section, Olowa and Copeck Centre. Questionnaires were then randomly administered on two categories of people that had direct impact on the forest reserve: indigenous people in each of the villages or section of the forest reserve and the forest guards attached to protect the forest reserve. Interview questions for both the divisional forest officer and a forest officers on policy formulation in the Department of Forestry, Oyo state contained twenty six (26) items, based on the core of conservation of the forest reserve, observable activities, how they are able to combat negative activities, their relationship with the rural community and sustainability of the reserve in relation to the state forest policy.

Data obtained was analyzed using involved descriptive and inferential statistics. Descriptive statistical techniques such as percentages and frequency count were used to analyse the demographic variables. Inferential statistics in the form of chi-square (χ^2) was used to measure the degree of involvement of the local people in the planning and management of the Forest Reserve, as well as in determining the effectiveness of the Oyo state forest policy in the management of the Forest Reserve based on Bhattachary and Johnson (1977) model:

$$\chi^2 = \frac{\sum [O_{ij} - E_{ij}]^2}{E_{ij}}$$

Where O_{ij} = Observed frequency and E_{ij} = Expected frequency

Results and Discussion

According to the demographic features of the local community (Table 1), there are more men than women. This finding supports the assertion by Okali and Amubode (1995) that the application of indigenous knowledge in conserving forest resources is led by men so that the traditional decision-making processes are dominated by them. Findings also show that male dominance in farming, traditional healing and hunting is also evident.

Table 1: Demographic characteristics of the local community

Characteristics	Frequency	Percentage (%)
Sex		
Male	85	56.7
Female	65	43.3
Total	150	100
Age (Years)		
20 – 30	17	11.4
30 – 40	118	78.6
Above 40	15	10
Total	150	100
Marital Status		
Single	29	19.4

Married	121	80.6
Total	150	100
Family Size		
2 – 7	86	71.1
>8	35	28.9
Total	121	100
Education		
No Formal Education	60	40
Primary	59	39.4
Secondary	23	15.3
Others	8	5.3
Total	150	100

There is a strong relationship between age and encroachment in forest reserves. This implies that encroachment in the reserve is affected by the age of the respondent. There were more people in the very productive age bracket (30 – 40 years). This age group accounted for nearly 80% of the encroachment within the forest reserve (Table 1). Experience has shown that this age group is active, dynamic and possesses the required strength and vigour to face the stress involved in the clearing or conversion of the forest for farming purposes.

Most of the respondents are married thus implying greater reliance on the forest reserve for sustenance. It is worthy of note that owing to the dependence of families on the forest reserve for livelihood, the reserve is negatively affected by activities of the people living around it. The married people are dominant in the economic activities associated within the forest because it is the responsibility of parents to fend for their children and wards.

Most families are average in size numbering mostly about four (Table 1). It is reasonable that most families are not in excess; hence, most of the people are not polygamous. The reasons behind large family sizes and consequent impacts are socio-cultural and economic. Members of the family will supply labour. Unduly large families may create problem because it may not be possible for such families to access a large hectares of land for cultivation. It is therefore pertinent to note that family size impacts negatively on the forest reserve.

A little less than half of the population of the local community has some form of education. Even the one without formal education will operate within the reserve guided by general rules. However, the literate ones may do better under the existing regulations guiding the forest reserve. Therefore, this study confirms the submission of Hedge *et al* (1996) that literacy level had direct bearing on both timber forest products and non-timber forest products.

Table 2: Factors responsible for encroachment

Characteristics	Frequency	Percentage (%)
Occupation		
Farming	68	43.9
Trading	10	6.8
Forest Reserve Staff	-	-
Others	72	49.3
Total	150	100
Farm Land Location		
Inside the Reserve	50	70.4
Outside the Reserve	21	29.6
Total	71	100
Access to Land		
Project Manager	41	57.7
Self	30	42.3
Total	71	100
Participation		
No	96	64
Yes	54	36
Total	150	100
Common Activity		
Farming	58	40
Tree Felling	29	20
Hunting with trap	8	5.5
Hunting using fire	30	20.7
Others	20	13.8
Total	145	100
Activity involved		
Tree felling	6	10.5
Tree tending	16	28.1
Nursery establishment	27	47.4
Farming	6	10.5
Total	57	100
Who involved you		
Project Manager	2	3.7
Friend	4	7.4
Self	48	88.9
Total	54	100

The result in Table 2 above shows that there are various occupation of the local community which include farming, trading, hunting, fuel-wood collection and collection of non-timber forest resources such as leaf, snail, etc. The response has shown that there is upward an swing in number of people who farm in the reserve because of fertile land and non-payment of taxes or rent on land. This finding supports the observation by Okali and Amubode (*op.cit*) that in Nigeria's

forest region, crop farming is the dominant activity, about 70 percent of which is devoted to Cocoa, Kolanut and oil palm as cash crops, dominated by men; the rest goes to food crops dominated by women. However, it is important to note that the non-payment of rent on farm lands in the reserve will encourage the local community to go further into the reserve and security of the forest is in danger. In essence, this will have serious impacts on the biodiversity of the reserve in terms of plant and animals. This finding confirms the assertion of United Nations Framework Convention on Climate Change (2007) that the overwhelming direct cause of deforestation is agriculture.

Over 70% of the local community has their farm land inside the forest reserve (Table 2). This will negatively impact the integrity of the forest because the reserve is supposed to serve protective functions. It is pertinent to add that these people do not replant felled trees. This means that after exhausting the nutrient content of their farms, they will move further into the forest reserve. By implication, the rate of deforestation will continue to increase. The rate of farming inside the forest reserve may be attributed to ability of the respondents to access the farmlands without approval by the Divisional Forest Officer as result has shown that more than half the local people occupy forest lands illegally without obtaining permit or authorization from the management of the forest reserve (Table 2). By implication, the farming activities inside the forest reserve are illegal and largely unregulated. This portends danger for the security of the reserve as these human activities negatively impact the sustenance of the forest reserve.

The local community was also observed to be involved in decision making and drawing up plans for effective management of the forest reserve. By implication, the decision of the rural people is not reflected in the day-to-day programmes of the Forest Reserve. This means that community participation in the development of forest management plan is nil in Onigambari Forest Reserve. This is because the current forest policy does not accommodate them. The reality on ground is that the people occupy the forest land illegally, at times with the connivance of the forest officers. Therefore, this study recommends community participation in the forestry management to curb illegal activities. Towards this end, it is imperative to involve the local community in collective decision-making, planning, establishment, management and harvesting of forest crops and so receive a major proportion of the socio-economic and ecological benefits from the forest.

Few of the local people are involved either in carrying out fire control measures such as participating in fire-tracing activities or nursery activities. It is essential to add that nursery operations are seasonal. Also, findings have shown that government investment in forest reserves is low. Therefore, even though those engaged in nursery activities will benefit more, it is important to note that this is ephemeral especially

as government investment in management of the forest reserve will be minimal.

Over 99% of the local community claims that there is cooperation between them and the forest reserve authority (Table 3). This cooperation is in form of tolerance, which exists owing to mutual benefit that arise because the local community depends on the reserve for their source of livelihood, while the management of the reserve would call on the people in case of fire outbreak. Therefore, the local people safeguard their farms and the forest due to mutual interest.

Table 3: Factors affecting involvement with the forest reserve management

Cooperation	Frequency	Percentage
No	1	0.7
Yes	144	99.3
Total	145	100
Benefit		
No	6	4.1
Yes	142	95.9
Total	148	100
Cooking Material		
Gas Cooker	-	-
Electric Cooker	-	-
Fuel-wood	69	42.6
Kerosene Stove	79	53.4
Total	148	100
Specific benefit		
Source of food	121	83.4
Source of income	22	15.2
Hunting site	2	1.4
Total	145	100
Relationship		
Cordial	141	98.6
Not cordial	2	1.4
Total	143	100

From Table 3, it is evident that the forest reserve is beneficial to the local community as source of income, food, fuel-wood, hunting site, timber products and other non-timber forest products such as leaves for wrapping. It is important to note that those who pick wild fruits, mushrooms, snails, etc, are also sourcing food from the reserve but without cultivation. This is expected due to poverty and decline in national economy, and in maximizing such benefit, the activities will negatively impact the forest reserve.

Fuel wood extraction has impacts on the forest reserve (Table 3). The extraction fuel-wood for various reasons and its impacts on forest health is confirm by Geist and Lambin (2002) that extraction of fuel-wood is one of the major underlying factors responsible for deforestation.

Table 4: Response of Forest Officers

Characteristic	Frequency	Percentage
Education		
No formal education	0	0.0
primary	0	0.0
secondary	5	29.4
Others	12	70.6
Total	17	100
Functions		
Patrol/protection	9	52.9
Administration	4	23.5
Policy formulation	2	11.8
Revenue collection	2	11.8
Total	17	100
Forest policy		
Replacement of felled trees	12	70.6
Nursery establishment	5	29.4
Total	17	100
Programme in-line with policy		
No	6	40
Yes	9	60
Total	15	100
Sustainability		
No	4	28.6
Yes	10	71.4
Total	14	100

There is differing opinion on state forest policy among the forest officers. State forest recommended that felled tree should be replaced. Hence, for every felled tree, four trees should be planted. Response of the forest officer shows that the level of understanding with respect to state forest policy is not uniform. Some believe the current management is sustainable, while others believe otherwise. When there is no understanding of a clear-cut state forest policy, it may lead to non-cooperation among the forest officers. This divergence in understanding of the state forest policy will not lead to effective management of the forest reserve. By implication, conflict of opinion among the serving forest officers could lead to non-compliance by the local community living around the forest reserve; especially because those who occupy the land illegally will align more with the forest officers who believe that the programme of Onigambari forest reserve is sustainable. Hence, the object of management of the forest reserve may not be achieved.

Table 5: Inferential Statistics

Table 5.1: Relationship between age of respondents and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	135.176	5.991	Reject H ₀
DF		2	

P<0.05

Table 5.2: Relationship between marital status of respondents and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	61.395	3.841	Reject H ₀
DF		1	

P<0.05

Table 5.3: Relationship between family size of the respondents and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	21.496	3.841	H ₀
DF		1	

P<0.05

Table 5.4: Relationship between educational background of respondents and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	58.649	7.815	Reject H ₀
DF		3	

P<0.05

Table 5.5: Relationship between occupation of respondents and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	47.689	5.991	Reject H ₀
DF		2	

P<0.05

Table 5.6: Relationship between location of respondent farm land and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	11.845	3.841	Reject H ₀
DF		1	

P<0.05

Table 5.7: Participation in reserve activities and involvement of indigenous people in planning and implementation of programme

	Calculated	Tabulated	Decision
χ^2	81.700	5.991	H ₀
DF		2	

P<0.05

Table 5.8: Relationship between activities in the forest reserve and encroachment in the forest reserve

	Calculated	Tabulated	Decision
χ^2	47.034	9.488	Reject H ₀
DF		4	

P<0.05

Table 5.9: Involvement of indigenous people and programme planning and implementation in the reserve.

	Calculated	Tabulated	Decision
χ^2	126.675	5.991	Reject H ₀
DF		2	

P<0.05

Table 5.10: Cooperation with forest reserve management and involvement of indigenous people in planning and implementation of programme

	Calculated	Tabulated	Decision
χ^2	141.028	3.841	Reject H ₀
DF		1	

P<0.05

Table 5.11: Relationship between benefit derived from the project and involvement in forest reserve programme

	Calculated	Tabulated	Decision
χ^2	124.973	3.841	Reject H ₀
DF		1	

P<0.05

Table 5.12: Relationship with officers and involvement in planning and implementation of programme in the forest reserve

	Calculated	Tabulated	Decision
χ^2	135.112	3.841	Reject H ₀
DF		1	

P<0.05

Table 5.13: Relationship between replacement of felled trees and effectiveness of state forest policy

	Calculated	Tabulated	Decision
χ^2	9.143	5.991	Reject H ₀
DF		2	

P<0.05

Table 5.14: Cooperation with forest reserve management and effectiveness of state forest policy

	Calculated	Tabulated	Decision
χ^2	141.028	3.841	Reject H ₀
DF		1	

P<0.05

IV. CONCLUSION

In consonance with results of the study, there are several factors upon which encroachment is dependent. Foremost among them is occupation. Other factors include: Sex, age, marital status, family size, literacy level, location of farm-land of the respondents; right to land, domestic fuel materials of the respondents, activities carried out in the forest reserve, participation and involvement of the people in the management and implementation of programmes in the reserve; Cooperation between the indigenous people and the officers of the reserve as well as perception of the people on the benefits they derive from the reserve.

Finding has shown that community folks were not involved in the management and implementation of programmes in the forest reserve. In-line with Oyo State forest policy, every felled tree must be replaced. Also, the effectiveness of state government forest policy depends on the perception of respondents about replacement of felled trees as well as the cooperation between the reserve management and the local people. The use of fire for hunting by the indigenous people has grave consequence and could lead to total loss of the resources of the forest if nothing is done to curtail the spate of hunting with fire. Illegal farming within the forest reserve by the rural people also has grave consequence on the sustainability of the forest and this could lead to unrestrained and wanton destruction of the forest with its consequent loss of resources.

It is evident from the result that the community folks were not actively involved in the management and implementation of the programmes in the forest reserve. This is evident in the response of 62.9% of the respondents who claim that they felt side-lined; this might have forced most of them to access their farm lands without government approval.

The opinion of the forestry officers is contradictory. Their responses tend to imply that there is no clear-cut state forest policy. A forest reserve that must be sustainably managed should however have a clear policy. The sustainability of the forest reserve is dependent on its effective management with a strong bearing on the need of those living around the reserve. Adequate participation and involvement of the people in the forest reserve activities will go a long way in ensuring the restoration and protection of the forest reserve. This participation should be community-based forestry practice where the decision of those living in and around the reserve will reflect in the programme implementation.

In line with this, we recommend the following: that Oyo State Government should actively involve the community for income generation and restoration of the reserve; a proportion of the revenue from timber should go to the local people; active taungya farming should be re-introduced in order to enhance tree planting; there should be proper education of the local people to enlighten them on the dangers of forest fires and consequence of forest degradation; there should be recruitment of more foresters of different specializations as

well as task force to help combat the menace of illegal felling, prohibit encroachment and promote health of the forest and sustainability of the reserve; a clear and unambiguous forest policy should be made, the 1959 forestry ordinance should be reviewed to ensure stronger legislation and control of forest resources. The scenario of lack of understanding of clear-cut policy among the forest officers calls for retraining of the officers through various means including short course, symposia, etc.

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