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Community participation and sustainable forest management in lanlate forest reserve ,Oyo-State ,Nigeria

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Abstract

The research on community participation (CP) and sustainable forest management (FM) was carried out in Lanlate forest reserve, Oyo State. Out of twelve (12) major communities identified, four (4) communities were selected. Ten percent sampling intensity was used to select 108 respondents for the study. Primary data were collected with the aid of a well-structured questionnaire. A total of 108 questionnaires were administered while 98 were retrieved. Data were analyzed using descriptive and logistic regression analysis. The result showed that 61.2% of the respondents were male, 74.5% were married, 71.4% have a household size of between 1-5 members and 34.7% have primary education. Major FM practices were; forest protection against illegal activities (80.6%), management of wildlife (80.6%) and non-timber forest products harvesting and monitoring (75.5%). The study also showed that Economic benefits of FM was a major factor that influenced CP in FM followed by Social benefits of FM, Level of external support/capacity building, Level of incentives and benefits sharing with odds-ratio value of 211.62, 94.62, 65.80 and 45.33 respectively. The major socio-economic impacts of CP in FM are increased income from sales of forest products (86.7%), local capacity building in FM (85.7%), increased economic opportunities from FM activities (82.7%). However, majority (91.8%) of the respondents agreed that inadequate capacity and skills, lack of financial resources (79.6%) and lack of economic incentives (76.5%) were major constraints facing local communities in FM.

The provision of alternative livelihood options to reduce dependence on forest resources and incentives should be provided to the community members to motivate them in forest production in areas where participatory FM is implemented.

Keywords: Community participation, sustainable forest management, forest reserve, Lanlate and Respondents.

Introduction

Community participation (CP) is seen as a system or ideas which are imbedded in the beliefs from the social and political opinions relating to the way a group of people live [1]. This gives a ready acceptance to the essence of setting up connections and sustaining communication, thus, creating strong bonds and relationships among the society. This further instils a sense of belonging, trust and acceptability among community members [2]. Similarly, this involvement requires that rural people be empowered with adequate knowledge about the forest and its resources, while enabling them to engage in sustainable development [1]. This was further corroborated by [3] who pointed out that the importance of communication among host community members is a key factor to development of local small businesses thereby encouraging CP.

However, the world's forests and woodlands are increasingly under pressure from the growing human population and many are disappearing as a result of human activities within the forest cycle. Forests which have been identified as protected areas that host plants and animal biodiversity and major source to the national economy (by providing renewable energy in the form of wood fuel and charcoal) are now at the verge of collapse [4]. Hence, there is an urgent need for CP as the majority of community-based organizations are formed on the basis of common interest to conserve the forests as well as improve the livelihoods of their members [5]; [6]. Such participation can ensure that the local communities become the focal point of sustainable forest development, therefore, initiating a critical decision-making process in sustainable forest management [7]. Therefore, this study seeks to assess the CP and its implication on sustainable forest management in Lanlante forest reserve in Oyo State. Nigeria.

Materials and Methods

Area of Study

This research was administered in Lanlate Forest Reserve situated in Oyo State, Nigeria. It spans an area of about 1,072 square kilometers (414 square miles) and is located in the southwestern part of the State near the town of Lanlate. The Lanlate Forest Reserve lies beteewn Latitude 7^0 15' 0" N and 7^0 43' 0" N and Longitude $3^0$25' 0" E and $3^0$37' 0" E. The forest reserve is 597 feet high above sea level. The forest reserve is a tropical rainforest ecosystem characterized by impenetrable vegetation, diverse tree species, and a rich diversity of wildlife. Some of the tree species found in the reserve include Iroko, Obeche, and Mahogany. The reserve is also home to several animal species, such as antelopes, bush pigs, and monkeys. Lanlate Forest Reserve provides a vital watershed for several rivers, including the Ogun and Opeki rivers, which furnish water to nearby towns. The reserve also has cultural and historical importance with evidence of antique human settlements and artifacts found within the area.

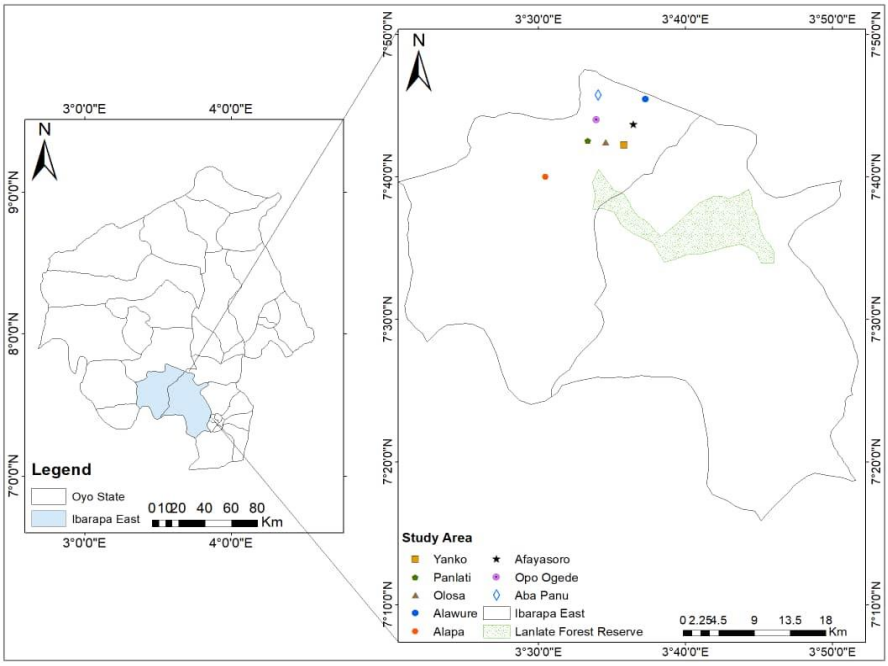

Figure 1: Map of the study area

Sampling Procedure and Sample Size

The sampling was done by carrying out a pilot survey with the perspective of determining the suitability of the area for the assessment of CP in forest management in Lanlate forest reserve, Oyo State. The major neighboring communities identified in the study area include Alawure, Alapa, Epo-ogede, Afayasoro, Aba panu, Panlati, Olosa, and Yanko. Four (4) villages were randomly selected for the study, they are: Alapa, Epo-Ogede, Yanko and Olosa with a projected population of 330, 200, 300 and 250 correspondingly. Furthermore, 10% sampling intensity according to [5] was used to select respondents for the study. In view of this, 108 questionnaires was distributed in the study area which include 33 in Alapa, 20 in Epo-Ogede, 30 in Yanko and 25 in Olosa. A total of 108 questionnaires were administered and 98 were retrieved.

Method of data collection and data analysis

Primary and secondary data were used for the study through the use of well-structured questionnaires. The questions were structured in line with the research objectives. The questionnaire consist of section A to E, section A addressed the demographic information of the respondent, section B was on the identification of forest management practices carried out by community people, section C accessed the factors that influences local CP in forest management, section D viewed the socio- economic impact of CP in forest management, while section E considered the

challenges involved in CP in the study area. Data were analyzed using descriptive statistics and logistic regression analysis.

Results and Discussions

The result in Table 1 shows the demographic characteristics of the respondents in the study area. It was revealed that 61.2% were male while 38.8% were female. This implies that majority of the respondents were male and are much more involved in forestry related activities. This may be due to the labour demands of forestry activities as more male than female tends to get involved in such activities. This corroborated the findings of [8] who stated that more males than females engage in agriculture and forest activities. The result also showed that there was a higher percentage of respondents between the ages of 51-60 years with about 31.6% while the least (6.1%) of the respondents fell between the ages of 71-80 years. This shows that respondents in their middle age engage more in forest management activities. The distribution by marital status shows that 74.5% were married while 4.1% were single. This account for the fact that most of the respondents are married and will have responsibility to cater for their families and this can influence them to engage in forest management. This result is in line with [5] which state that 63.3% of respondents were married and will owe additional responsibility to their families. Furthermore, majority of respondents (71.4%) have a household size of between 1-5 members while the least (4.1%) was recorded in household above 15 members. This stipulates that respondents with household size of 1-5 are more dominant in the area.

The educational level shows that 34.7% have primary education while 15.3% have secondary education. In addition, about 31.6% of the respondents are farmers while 7.1% of the respondents are engaged in non-timber forest products (NTFP) gathering indicating that most of the respondents were engaged in farming activities. As regards nativity of respondents, 68.4% are indigenes while 31.6% are non-indigene. This shows that there is a higher percentage of respondents possessing indigenous knowledge of the area thereby giving room for the practice of sustainable forest management in the area. With regards to the number of years of residency, 37.8% have lived in the study area for about 21-40 years while 2.0% of the respondents have lived for about 41-60 years. This shows that majority of the respondents have been living in the study area for quite a long time. This supported the findings of [2] who reported that respondents residing within communities of the forest reserves utilize the forest for agriculture, hunting, livestock grazing, logging and other benefits of forest.

Table 1: Demographic Characteristics of the respondents

Socio-economic characteristics	Frequency	Percentage (%)
Sex		
Male	60	61.2
Female	38	38.8
Total	98	100
Age (years)		
21 – 30	17	17.4
31 – 40	15	15.3
41 – 50	20	20.4

51 – 60	31	31.6
61 – 70	9	9.2
71 – 80	6	6.1
Total	98	100
Marital status		
Married	73	74.5
Divorced	11	11.2
Widow	10	10.2
Single	4	4.1
Total	98	100
Household size		
1 – 5	70	71.4
6 – 10	17	17.4
11 – 15	7	7.1
>15	4	4.1
Total	98	100
Education level		
No formal education	28	28.6
Primary education	34	34.7
Secondary	15	15.3
Tertiary	21	21.4
Total	98	100
Occupation		
Farming	31	31.6
Trading	24	24.5
Forest official	15	15.3
Hunting	9	9.8
Logging	12	12.2
NTFP collector	7	7.1
Total	98	100
Nativity		
Indigene	67	68.4
Non-indigene	31	31.6
Total	98	100
Years of residency		
1 – 20	23	23.5
21 – 40	37	37.8
41 – 60	30	30.6
61 – 80	6	6.1
>81	2	2.0
Total	**98**	**100**

Identification of forest management practices in the study area

The result in Table 2 shows the forest management practices carried out by the community people. The major forest management practices include; forest protection against illegal activities (80.6%), management of wildlife by ensuring regulation (80.6%), and collection of seeds for afforestation purpose (53.1%). This is an indication that the community people are well involved in forest activities in the area. This corroborated with the findings of [7] who stated that millions of people particularly agrarian societies have been engaged in forest-based activities to support their livelihood.

Table 2: Identification of forest management practices in the study area

Forest management practices	Yes Freq.(%)	No Freq.(%)
Have you witnessed or got involved in any kind of forest management practices?	77(78.6)	21(21.4)
Forest management practices		
FPIA	79(80.6)	19(19.4)
HFS	64(65.3)	34(34.7)
CLC	56(57.1)	42(42.9)
NTFPHM	74(75.5)	24(24.5)
MW	79(80.6)	19(19.4)
ECOTOURISM	55(56.1)	43(43.9)
AP	73(74.5)	25(25.5)
PFRR	60(61.2)	38(38.8)
TH	57(58.2)	41(41.8)
CSAP	52(53.1)	46(46.9)
FTA	58(59.2)	40(40.8)
EP	68(69.4)	30(30.6)

Where, FPIA = Forest protection against illegal activities; HFS = Harvesting fuel wood in a sustainable way; CLC= Community led conservation; NTFPHM = Non-timber forest product harvesting and monitoring; MW = Management of wildlife; AP = Agroforestry practices; PR = Participation in reforestation in reserve area; TH = Thinning; CSAP = Collection of seeds for afforestation purpose; FTA = Fire terracing activities; EP = Establishment of plantations

Logit regression model for factors influencing local community participation in forest management in the study area

Table 3 showed the binary regression models obtained for factors influencing local community participation in forest management in the study area.

FIPFM = -36.38 + 2.11LEAFM + 1.48LLDMP + 5.36EBFM + 2.73EBFMA + 4.55SBFM + 0.60GPRRF + 4.19LESCB - 3.81LIBS - 2.51LCSFM + 2.45CVAF ---------- (Eqn. 1)
N = 98, Chi-square (df, 10) = 36.38, P = 0.000
Odds - ratio (Unit Change): Constant (0.00); LEAFM (8.20); LLDMP (4.40); EBFM (211.62); EBFMA (15.28); SBFM (94.62); GPRRF (1.82); LESCB (65.80); LIBS (45.33); LCSFM (0.08); CVAF (11.57)
Where, FIPFM = Factors influencing local community participation in forest management, LEAFM = Level of education and awareness about forest management, LLDMP = Level of local decision-making power, EBFM =

Economic benefits of forest management, EBFMA = Environmental benefits of forest management, SBFM = Social benefits of forest management, GPRRF = Government policies and rural regulation on forest, LESCB = Level of external support and capacity building, LIBS = Level of incentives and benefits sharing, LCSFM = Local capacity for sustainable forest management, CVAF= Cultural values associated with forests.

Table 3. Logit regression model for factors that influences local community participation in forest management in the study area.
Dependent variable (FIPFM) = Factors influencing local community participation in the study area (Yes = 1; No = 0)

Independent variables	Coefficient	Odds-Ratio
LEAFM	2.11	8.20*
LLDMP	1.48	4.40*
EBFM	5.36	211.62**
EBFMA	2.73	15.28*
SBFM	4.55	94.62*
GPRRF	0.60	1.82
LESCB	4.19	65.80*
LIBS	3.81	45.33*
LCSFM	-2.51	0.08
CVAF	2.45	11.57*
Constant	-36.38	0.00
Model x^2 (df, 10) = 36.38, P < 0.000		

Where, FIPFM = Factors influencing local community participation in forest management, LEAFM = Level of education and awareness about forest management, LLDMP = Level of local decision-making power, EBFM = Economic benefits of forest management, EBFMA = Environmental benefits of forest management, SBFM = Social benefits of forest management, GPRRF = Government policies and rural regulation on forest, LESCB = Level of external support and capacity building, LIBS = Level of incentives and benefits sharing, LCSFM = Local capacity for sustainable forest management, CVAF= Cultural values associated with forests.

The results in Table 3 revealed the model on factors influencing local community participation in forest management in the study area. The model shows how the independent variables influenced the dependent variable. It projected how each variable contributed to the factors that influence local community participation in forest management in the study area. The equation shows that the independent variable, LCSFM had a negative or inverse relationship with factors influencing community participation in forest management. However, LEAFM, LLDMP, EBFM, EBFMA, SBFM, LESCB, LIBS and CVAF had a significant impact on the factors that affects community participation or involvement in forest management. The Table also revealed that Economic benefits of forest management (EBFM) was a major factor that influenced community participation in forest management with odds ratio of 211.62. This was followed by SBFM, LESCB and LIBS with odds-ratio value of 94.62, 65.80 and 45.33 respectively. If there are high economic benefits to forest management, individuals and communities' participation are likely to increase as it aids and boost them to become more involved in the management and conservation of the forest. This can lead to improvement in livelihood and enhance capacity building. This agrees with the findings of

[9] who stated that forest is a useful natural capital with multiple socio-economic and ecological functions, and is the most accessible resources available for low-income households.

Socio-economic impact of community participation in forest management in the study area

The Table 4 shows the socio-economic impact of community participation in forest management in the study area. The study shows that there is highest increased income from sale of forest products (86.7%) and there is limited (55.1%) improved governance and resource management practices. These agrees with the findings of [9] who stated that forest is a useful natural capital with multiple socio-economic and ecological functions, and are the most accessible resources available for low-income households. [10] also stated that millions of people particularly agrarian societies have been engaged in forest-based activities to support their livelihood.

Table 4 Socio-economic Impact of Community Participation in Forest Management in the study area

Socio-economic impact	Yes Freq.(%)	No Freq.(%)
1. Local Capacity Building in Forest Management	84(85,7)	14(14.3)
2. Increased Economic Opportunities from Forest Management Activities	81(82.7)	17(17.3)
3. Increased Income from Sale of Forest Products	85(86.7)	13(13.3)
4. Increased Food Security from Forest Product Use	74(75.5)	24(24.5)
5. Improved Health through Access to Forest Based Products	71(72.4)	27(27.6)
6. Improved Social Cohesion and Community Well-being	69(70.4)	29(29.6)
7. Improved Governance and Resource Management Practices	54(55.1)	44(44.9)
8. Improved Governance and Resource Management Practices	62(63.3)	36(36.7)
9. Increased Political representation and Decision-Making Power	61(62.2)	37(37.8)
10. Increased Employment Opportunities	75(76.5)	23(23.5)
11. Improved Human Rights and Social Justice	76(77.6)	22(22.4)

Challenges involved in community participation in the study area

The Table 5 shows the challenges involved in community participation in the study area. This study shows that major challenges experienced by respondents are inadequate capacity and skills (91.8%), lack of financial resources for participation (79.6%), lack of economic incentives for community participation (76.5%), lack of access to markets for forest products (71.4%) and inadequate policy and legal framework for community participation (71.4%). Also, 70.4% of respondents indicated inadequate infrastructure and transportation facilities. This therefore supported the findings of [3] which stated that community capacity is a crucial factor for enhancing community participation and for effective implementation of community development interventions. Research by [5] and [11] also suggested that communities with limited capacity are less likely to get organized and engage in any kind of forest management.

Table 5: Challenges involved in community participation in the study area

Challenges	Yes	No

	Freq. (%)	Freq. (%)
1. Inadequate Capacity and Skills	90(91.8)	8(8.2)
2. Lack of Economic Incentives	75(76.5)	23(23.5)
3. Cultural and Social Barriers	67(68.4)	31(31.6)
4. Lack of Legal Rights and Security of Tenure	62(63.3)	36(36.7)
5. Lack of Access to Markets for Forest Products	70(71.4)	28(28.6)
6. Inadequate Infrastructure and Transportation Facilities	69(70.4)	29(29.6)
7. Conflict and Competition over Forest Resources	65(66.3)	33(33.7)
8. Political Interference in Forest Management	62(63.3)	36(36.7)
9. Lack of Financial Resources	78(79.6)	20(20.4)
10. Bureaucratic and Administrative Barriers	60(61.2)	38(38.8)
11. Inadequate Policy and Legal Framework	70(71.4)	28(28.6)

Conclusion

Community participation is a very vital in conservation and protection of the forest resources. Public awareness has to be created and the local people have to be involved in all the stages of community forestry development. To ensure success in the battle against deforestation and environmental degradation and the success on sustainable management of indigenous forest projects, community forestry has to be greatly emphasized. Using technology and innovation to support community-led forest management will enable the community members to appreciate the benefits from the forest reserves, prevent any illegal activities that threaten the sustainability of forest management and rekindle their commitment to the sustainability of the forest reserves. Forest communities should be involved in the decision-making on forest management issues and forest by-laws and regulations formation processes. However, stakeholders, particularly traditional authorities require greater capacity to exercise their rights and execute their responsibilities in forest management. The Forestry Department and NGOs should therefore build the capacity of community members and traditional authorities to ensure meaningful participation. The Forestry Department should encourage infrastructural development in the forest communities for the benefit of all community members. The benefits sharing system should be transparent and accountable.

Author contributions statement

Contribution of Authors: for this study these were the authors contributions, "conceptualization, Olawuyi E. B. and Odeyale O. C.; methodology, Olawuyi E. B. and Odeyale O. C; software, Olawuyi E. B. and Odeyale O. C.; validation, Olawuyi E. B. and Odeyale O. C.; formal analysis, Olawuyi E. B.; investigation, Olawuyi E. B.; resources, Olawuyi E. B. and Odeyale O. C.; data curation, Olawuyi E. B..; writing—original draft preparation Olawuyi E. B.; writing—review and editing, Olawuyi E. B. and Odeyale O. C; visualization, Olawuyi E. B. and Odeyale O. C.; supervision, Olawuyi E. B. and Odeyale O. C.; project administration, Olawuyi E. B. and Odeyale O. C.; funding acquisition, Olawuyi E. B. and Odeyale O. C.

Conflicts of Interest: "The authors declare no conflict of interest''.

References

[1] Sanz-Hernández, A. Privately Owned Forests and Woodlands in Spain: Changing Resilience Strategies towards a Forest-Based Bioeconomy. Land Use Policy, 100, Article ID: 104922. 2021 DOI: https://doi.org/10.1016/j.landusepoi.2020.104922

[2] Stone, L.S. and Stone, T.M. Community-based tourism enterprise: Challenges and prospects for community participation; Khama Rhino Sanctuary Trust, Botswana. *Journal of Sustainable Tourism*, 19(1), 97–114. 2011 DOI: 10.1080/09669582.2010.508527

[3] Olawuyi, E. B**.** Illegal Activities in Ago-Owu Forest Reserve in Osun Sate and its Implication on Sustainable Forest Management. *Journal of Research in Forestry, Wildlife & Environment* Vol. 11(3): 296-305 September, 2019. DOI: http://www.ajol.info/index.php/jrfwe.2019

[4] Chilagane, N. A., Kashaigili, J. J., Mutayoba, E., Lyimo, P., Munishi, P., Tam, C., and Burgess, N. Impact of Land Use and Land Cover Changes on Surface Runoff and Sediment Yield in the Little Ruaha River Catchment. *Open Journal of Modern Hydrology*, 11 (03), 54-74. 2021. DOI:10.4236/0jmh.2021.113004

[5] Hampton, M.P. Heritage, local communities and economic development. Annals of Tourism Research, 32(3), pp. 735–759, 2005. DOI: http://dx.do.org/10.1016/j.annals.2004.10.0101

[6] Atinga. R. A., Agyepong I. and Reuben K. E. Willing but unable? Extending theory to investigate community capacity to participate in Ghana's community-based health planning and service implementation. Evaluation and Program Planning.72.2018. DOI: 10.1016/j.evalprogplan.2018.10.001

[7] Chiwaya, C., and Mzu- za, M. K. Factors Influencing Community Participation in Forestry Management in Chiradzulu District, Malawi. *Open Journal of Forestry*, 12, 177-184. 2022. https://doi.org/10.4236/ojf.2022.122010

[8] Rasoolimanesh, S.M. and Jaafar, M. Residents' perception toward tourism development: A pre-development perspective. *Journal of Place Management and Development 9(1), 91-104.* (2016) DOI: https://doi.org/10.1108/JPMD-10-2015-0045

[9] Tosun, C. Limits to community participation in the tourism development process in developing countries. Tourism Management, 21 (6): 613–633. 2000. DOI:10.1016/S0261-5177(00)00009-1

[10] Guariguata, M.R. and Balvanera, P. Tropical forest service flows: improving our understanding of the biophysical dimension of ecosystem services, *For. Ecol. Manage*. 258 (9) 1825–1829, 2009. DOI: https://doi.org/10.1016/j.foreco.2009.06.025.

[11] Agarwal, B. Participatory Exclusion community forest, and Gander, an Analysis for south Asia and conceptual framework. World Development, 29 (10):1623-1648, 2001. DOI: 10.1016/S0305X (01)00066-3