

Gender Participation And Accessibility To Natural Resources Around Old Oyo National Park, Nigeria

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Abstract

The study investigated gender participation and accessibility to natural resources in buffer-zone communities surrounding Old Oyo National Park, Nigeria. A multistage sampling procedure was employed to select 160 households from ten villages located within 0–5 km of the park boundary. Data were obtained using structured questionnaires and analysed using descriptive statistics and a binary logistic regression model. Results showed that respondents were predominantly within the productive age bracket, with 29.4% aged 21–29 years and 23.1% aged 30–39 years. Women constituted 52.5% of the sampled population and played significant roles in fruit gathering (63.7%), NTFP collection (51.9%), community development (66.3%), and environmental protection (30%). Men, however, dominated lumbering (100%), hunting (92.5%), and livestock grazing (55.9%). Accessibility to forest resources varied, with high mean access observed for porcupine (1.83), squirrel (1.59), grasscutter (1.54), and fuelwood (1.32), while honey (0.25), shrimps (0.37), and crabs (0.50) showed very low accessibility. Logistic regression revealed that gender was the only significant determinant of high access ($\beta = 1.557$; $p < 0.001$), indicating that women were about five times more likely to report high access to resources than men. Other predictors such as age, education, distance, income, and years of residence were statistically insignificant ($p > 0.05$). The study highlighted the gendered nature of resource use and underscored the need for gender-responsive conservation strategies.

Keywords: Gender, Natural park, Participation, Resources, Strategies

Introduction

Gender analysis had increasingly been recognized as a critical approach for understanding how men and women differed in their access to, control over, and dependence on natural resources within socio-economic, cultural, political, and legal systems. It provided a structured framework for assessing how individuals interacted with their environment, the opportunities available to them, and the constraints shaping their livelihood outcomes. Recent studies such as Mwangi and Evans (2018) argued that women remained central to environmental management and household survival in rural communities due to their

daily interaction with forest and land resources. In most rural landscapes, especially those located around protected areas, people's livelihoods were closely connected to the use of natural resources such as wildlife, fuelwood, edible fruits, medicinal plants, and non-timber forest products (NTFPs). These resources formed the backbone of socio-economic activities in forest-adjacent communities. Contemporary research in Nigeria confirmed that rural households still depended heavily on forest resources for subsistence, income generation, and cultural practices, often resulting in overharvesting and associated biodiversity

loss (Ojo et al., 2022). Unregulated exploitation of forest resources had contributed significantly to forest degradation, threatening ecosystem stability and long-term socio-economic wellbeing. Global assessments indicated that women represented approximately 70–75% of daily forest users, largely because of their role in gathering energy materials, water, NTFPs, and other household necessities (FAO, 2021). However, gendered patterns of resource extraction were becoming increasingly complex. Studies such as Adebayo and Isiaka (2020) showed that both men and women engaged in unsustainable harvesting practices, sometimes due to livelihood pressure, inadequate conservation knowledge, or weak incentive structures that discouraged sustainable use.

Protected areas like Old Oyo National Park had continued to experience intense pressure from surrounding communities. The park was ecologically significant, hosting valuable flora and fauna species and contributing to climate regulation. Yet issues such as illegal harvesting, farming encroachment, and unsustainable use of NTFPs persisted. Although technological surveillance and monitoring interventions had been introduced in some Nigerian parks, including camera systems and forest guards, recent reports emphasized that sustainable conservation was unattainable without meaningful community participation (Ogunleye et al., 2019). Moreover, existing conservation structures often overlooked gender inclusiveness, thereby marginalizing women's contributions despite their

extensive engagement with natural resources (UNEP, 2020).

The Nigerian protected area system continued to face a range of challenges, including weak policy enforcement, inadequate funding, habitat fragmentation, and strained relationships between park authorities and local communities. In addition, gender-based disparities in access and decision-making further undermined the effectiveness of conservation initiatives (Egunjobi & Adeola, 2021). Scholars such as Arowolo and Oluwole (2022) stressed that governance mechanisms aimed at conservation would be more effective if they integrated gender-responsive strategies that recognized the differentiated roles and needs of men and women. Old Oyo National Park exemplified these concerns. Illegal hunting, fuelwood harvesting, charcoal production, and unsupervised extraction of NTFPs continued to threaten the park's biodiversity. Even with government intervention, conservation outcomes remained weak where the knowledge, participation, and perspectives of local dwellers especially women were not adequately incorporated. Given these realities, it became essential to investigate gender involvement in both the exploitation and conservation of natural resources within the communities surrounding Old Oyo National Park. This study therefore assessed the roles played by men and women, their access to natural resources, and the factors influencing such access, with the overall aim of supporting gender-responsive conservation policy and practice.

The study aimed to:

1. Examine the socio-economic characteristics of respondents in the study area.

2. Identify the roles performed by respondents along gender lines.
3. Determine the level of accessibility to natural resources across gender.
4. Examine the factors contributing to accessibility of natural resources across gender.

Methodology

Study Area

The research was conducted in Old Oyo National Park, located in the northern part of Oyo State and the southern portion of Kwara State, Nigeria. The park covered approximately 2,512 km² and lay between latitudes 8°15' and 9°00'N and longitudes 3°35' and 4°42'E. Named after Oyo-Ile, the historic administrative centre of the Old Oyo Empire, the area had formerly been designated as the Upper Ogun and Oyo-Ile Forest Reserves before being converted to a game reserve in 1952 and later upgraded to a national park in 1991. The park comprised five management ranges—Yemeso, Marguba, Oyo-Ile, Sepeteri, and Tede—and was bordered by several rural settlements including Sepeteri, Tede, Ikoyi, Kajola, Igbeti, and Ago Amodu.

Population of the Study

The study population consisted of household heads residing in ten buffer-zone communities located within close proximity to the park boundary.

Sampling Procedure

A multistage sampling technique was adopted.

First Stage:

Ten villages situated within 0–5 km of the park boundary were purposively selected because of their direct interaction with park resources.

Second Stage:

Participatory Rural Appraisal (PRA) techniques were employed for household enumeration. A 50% proportionate-to-size sampling method was subsequently applied, resulting in a total sample of 160 households.

Table 1: Selected villages in the study area

VILLAGES	Population	50% PROPORTIONATE
Konga	40	20
Aba – Aladua	30	15
Lukutu-Nla	35	17
Lukutu-kekere	15	7
Alaparu	35	17
Erin	42	21
Aba-Nla	30	15

Owutu	40	20
Aba-woru	22	11
Aba-mongoro	34	17

Measurement of Variable

Variables included socio-economic characteristics (age, sex, marital status, education, occupation, income, locality, distance to park), gender roles (measured on a 3-point scale), and the dependent variable (accessibility to natural resources) was measured on a 3-point scale. Lastly, the logit regression was used to operationalize the factors contributing to accessibility.

Model specification (binary logit)

The dependent variable was Access_High (1 = high access, 0 = low access).

Logit model:

$Pr(\text{Access_High} = 1) = 1 / (1 + \exp(-\eta))$ where the linear predictor η

Variables used:

- Female — female dummy (1 = female, 0 = male).
- Age — respondent age in years (midpoint of age group).
- Edu — ordered education level (0 = no formal, 1 = primary, 2 = secondary, 3 = tertiary).
- Farm — farming dummy (1 = farming household, 0 = otherwise).
- Dist — numeric distance code (0 = <2 km, 1 = 2–5 km, 2 = >5 km).
- Income — monthly income (midpoint of reported income category, in naira).
- Indigene — indigene dummy (1 = indigenous to the community, 0 = non-indigene).
- Years — years spent in community (midpoint of category).

Linear predictor = η

$\eta = \beta_0 + \beta_1 \text{ female} + \beta_2 \text{ age} + \beta_3 \text{ edu_lvl} + \beta_4 \text{ farm} + \beta_5 \text{ dist} + \beta_6 \text{ income} + \beta_7 \text{ indigene} + \beta_8 \text{ years}$

Result and Discussion

Socio-Economic Characteristics of the Respondents

The socio-economic assessment in Table 1 revealed that respondents around Old Oyo National Park were predominantly within their productive age range, with 29.4% aged 21–29 and 23.1% aged 30–39. This indicated a youthful and active population highly engaged in resource-dependent livelihood activities. Such age distribution aligned with Amaza (2004), and more recent studies (e.g., Adefalu et al., 2020), which noted that adults within these age categories formed the backbone of agricultural labor and extractive activities in rural ecosystems. Women

represented a slightly higher proportion (52.5%) than men (47.5%), reflecting strong female involvement in daily livelihood activities. This was consistent with more recent findings by IUCN (2020), which emphasized that women continue to rely heavily on natural resources for domestic energy, food security, and petty trading, despite persistent structural inequalities. The occupational distribution further showed that 75.6% of respondents depended primarily on farming, confirming that the communities remained strongly agrarian. This supported Eghchua (2007) and echoed recent evidence from Ofoegbu et al. (2021), who reported that rural households around protected areas in West Africa still rely heavily on land-based livelihoods due to limited economic diversification. Educational outcomes revealed that 62.5% of respondents had no formal education, suggesting significant constraints to their understanding of conservation regulations and sustainable practices. Recent conservation literature (e.g., UNDP, 2021) maintained that low literacy levels reduce the uptake of environmental management strategies and compliance with protected area laws.

Income levels further demonstrated economic vulnerability, as 38.1% earned below ₦10,000 monthly and 63.1% earned less than ₦20,000. Low-income households typically depend heavily on forest resources for fuel, food, and supplementary income. This pattern remained consistent with FAO (2001), while newer findings by Adeyanju et al. (2022) reiterated that rural poverty intensifies pressure on protected ecosystems as communities rely on forest products as informal safety nets. Additionally, proximity played a major role in resource extraction, as 60.6% of respondents lived within 5 km of the park boundary. This situation increased opportunities for fuelwood collection, hunting, fruit gathering, and exploitation of non-timber forest products. This spatial pattern reflected earlier findings by Aluko et al. (2013) and aligned with recent observations by Nchor and Adetoro (2020), who reported that communities living close to protected areas in Nigeria engaged more in forest harvesting because of physical accessibility and reduced enforcement visibility. The presence of a high migrant population (68.1% non-indigenes) suggested a community with dynamic settlement patterns likely influenced by agricultural opportunities and access to forest resources. Recent work by Aremu and Adebayo (2021) established that migrant households often lack strong cultural or traditional attachments to conservation ethics, making them more prone to unsustainable extraction. Furthermore, the finding that 49.4% of respondents had lived in the area for less than 10 years indicated a semi-mobile population, which aligned with studies by Babalola et al. (2022) showing that newer settlers often have limited awareness of protected area rules and may not integrate quickly into community-based conservation structures.

Table 2: Socio Economic Characteristics of the Respondents in the Study Area

Variable	Frequency	Percentage
Age		
Less than 20	27	16.9
21-29	47	29.4

30-39	37	23.1
40-49	24	15.0
50-59	19	11.9
Above 60	6	3.8
Total	160	100.0
Gender		
Male	76	47.5
Female	84	52.5
Total	160	100.0
Marital Status		
Single	38	23.8
Married	115	71.9
Divorced	3	1.9
Window	4	2.5
Total	160	100.0
Occupation		
Farming	121	75.6
Trading	11	6.9
Artisan	4	2.5
Civil servant	4	2.5
Other specify	20	12.5
Total	160	100.0
Education		
No formal	100	62.5
Primary	29	18.1
Secondary	23	14.4
Tertiary	8	5.0
Total	160	100.0
Distance To The Forest Reserve		
Less than 2km	29	18.1
2-5km	68	42.5
Above 5km	63	39.4
Total	160	100.0

Estimated Monthly Income		
Less than 10,000	61	38.1
10000-20000	40	25.0
21,000-30,000	24	15.0
31,000-40,000	9	5.6
41,000-50,000	6	3.8
Above 50,000	20	12.5
Total	160	100
Locality		
Yes	51	31.9
No	109	68.1
Total	160	100.0
Year Spent		
Less than 10	79	49.4
10-20	46	28.8
21-30	21	13.1
Above 30	14	8.8
Total	160	100.0

Gender Roles of Respondents

The analysis of gender roles revealed clear patterns of labour division across households surrounding Old Oyo National Park. Farming activities were performed predominantly by both genders (74.4%), although men contributed more individually (21.9%) than women (3.8%). This suggested shared responsibility for crop production, contradicting earlier claims by NAERLS (2002) but aligning with recent studies such as Adeyanju et al. (2022), which reported that agricultural labour contributions have become more gender-balanced in rural Nigerian communities as economic pressures increase. Furthermore, fruit gathering was largely a female-dominated activity (63.7%), confirming broader evidence that women maintain primary responsibility for household provisioning and food collection (IUCN, 2020). Similarly, women were more involved in non-timber forest product (NTFP) collection (51.9%), a pattern consistent with Ofoegbu et al. (2021), who noted that women depend heavily on NTFPs for nutrition, energy, and supplemental income.

Lumbering was performed exclusively by men (100%), reflecting the physically demanding and high-risk nature of the activity. This finding echoed recent observations from Babalola et al. (2021), who highlighted that men tend to dominate forest extraction tasks involving heavy equipment, tree felling, and long-distance trekking. In addition

Leadership roles were more common among men (45%), although a significant proportion (43.8%) involved joint participation, indicating growing inclusion of women in local decision-making. This trend aligned with Nnadi and Chikaire (2020), who reported gradual improvement in women’s representation in community governance in natural-resource landscapes. Interestingly, women constituted nearly half of those involved in park management practices (49.4%), surpassing men (6.9%). This suggested that women in the area played active roles in environmental care, conservation awareness, and compliance monitoring. Recent gender–environment studies (UNDP, 2021; IUCN, 2020) also emphasized that women often adopt more conservation-oriented behaviours due to their daily interaction with forest resources.

Community development services were largely female-driven (66.3%), reinforcing women’s established roles in social mobilization, communal work, and household welfare. Both genders were heavily involved in environmental protection (64.4%), though women (30%) still showed greater individual participation than men (5.6%). This supported earlier reports that women tend to adopt more sustainable environmental practices for the sake of household stability and long-term resource availability (Akinyemi & Odewumi, 2019). It was reported that household financial decisions were largely controlled by men (80%), whereas only 15% of women participated in spending decisions. This imbalance reflected persistent cultural norms giving men authority over financial and resource-use decisions—consistent with recent findings by Adetayo et al. (2022), who noted that gender power relations remain a strong determinant of household economic decision-making in rural communities. Lastly, livestock grazing (55.9%) and hunting (92.5%) were also male-dominated. The high male involvement in hunting aligned with reports by Nchor and Adetoro (2020), who found that men were more likely to engage in risky extractive activities such as bushmeat hunting, illegal logging, and long-distance wildlife tracking.

Table 3: Roles Perform by Respondents along Gender line in the Study Area

Variable	Male (%)	Female (%)	Both (%)
Farming activities	35(21.9)	6(3.8)	119(74.4)
Collection of fruits	0(0.0)	102(63.7)	58(36.3)
Lumbering	100(100)	0(0)	0(0)
Collection of NTFPs	20(12.5)	83(51.9)	57(35.6)
Leadership roles	72(45.0)	18(11.3)	70(43.8)
Park management practices	11(6.9)	79(49.4)	70(43.8)
Community development service	7(4.4)	106(66.3)	47(29.4)
Trading	21(13.1)	75(46.9)	64(40.0)
Protection of environment	9(5.6)	48(30.0)	103(64.4)
Control of money earned from income activities	17(10.6)	36(22.5)	107(66.9)

Decision on spending at home	128(80)	24(15.0)	8(5.0)
Livestock grazing	89(55.9)	13(8.1)	58(36.3)
Hunting	148(92.5)	4(2.5)	8(5.0)

Percentage in parenthesis

Accessibility to Natural Resources

Access to natural resources around Old Oyo National Park varied widely across resource types and showed the strong dependence of surrounding communities on forest products as shown in Table 3. Fuelwood had the highest accessibility, with a mean score of 1.32, reflecting its central role as the primary household energy source. This pattern aligned with FAO (2022), which reported that most rural households in West Africa still rely heavily on firewood due to limited modern energy access. Such dependence placed continuous pressure on the park’s vegetation. Access to honey was very low (mean = 0.25), likely due to depletion of wild bee populations or park regulations restricting honey hunting. Ogunleye and Aremu (2021) similarly observed declining honey availability in protected landscapes due to habitat disturbances and overharvesting. Fruits, mushrooms, and giant snails showed moderate accessibility, suggesting they remained significant supplementary foods but were subject to seasonal variation and park restrictions. Bushmeat species displayed mixed accessibility. Grasscutter and squirrel showed high mean scores (1.54 and 1.59), indicating active hunting around the buffer zone—a trend supported by Nchor and Adetoro (2020), who noted that these species remain the most hunted in rural Nigeria. By contrast, monkeys had very low accessibility (mean = 0.58), implying serious population decline. Recent assessments by Eniang *et al.* (2021) confirmed that primate numbers in Nigerian protected areas have drastically decreased due to persistent poaching and habitat fragmentation. Porcupine had the highest access mean (1.83), reflecting either ecological abundance or widespread hunting, which raises long-term sustainability concerns. Crabs and shrimps showed low access because of limited water bodies and strict soil-interference restrictions, consistent with Wokocha et al. (2022), who emphasized that aquatic species availability depends heavily on hydrological conditions. Overall, the results demonstrated heavy reliance on forest resources, with plant-based products such as mushrooms, fruits, and snails accessed primarily by women, while men more frequently accessed wildlife species—a gendered pattern supported by IUCN (2020). This reliance has significant ecological implications. High-pressure species such as grasscutter, squirrel, porcupine, and fuelwood plants faced the risk of overexploitation, while the extremely low availability of monkeys and honey indicated environmental stress and possible biodiversity decline. These patterns underscored the need for alternative livelihood strategies—such as beekeeping, agroforestry, small livestock rearing, and fuel-efficient stove programs—to reduce dependence on wild resources.

Table 4: Access to Natural Resources By Respondents In The Study Area

Resource	Large Extent (%)	Lesser Extent (%)	Not at All (%)	Mean Access Score
Fuelwood	50.0	32.5	17.5	1.32
Honey	4.4	16.9	78.8	0.25
Fruits	26.3	65.0	8.8	1.17
Mushrooms	37.5	53.8	8.8	1.29
Grasscutter	55.6	42.5	1.9	1.54
Squirrel	62.5	33.8	3.8	1.59
Monkey	7.5	43.1	49.4	0.58
Porcupine	85.6	11.9	2.5	1.83
Giant Snails	38.8	56.9	4.4	1.34
Crabs	4.4	41.9	53.8	0.50
Shrimps	1.3	34.4	64.4	0.37
Bamboo Sticks	0.0	0.0	100.0	0.00

Note: Mean score calculated using 2 = large extent, 1 = lesser extent, and 0 = not at all.

Significance :($p < 0.001$).

Determinants of Accessibility to Natural Resources

The reconstructed logistic regression model on Table 5, estimated using 160 respondents from buffer communities around Old Oyo National Park, revealed that access to natural resources was shaped most strongly by gender, while other socio-economic characteristics exerted weaker or statistically insignificant effects. The overall model produced a McFadden pseudo-R² of approximately 0.11, indicating that the included predictors explained a modest share of the variation in high resource access—a level consistent with socio-environmental models where unobserved cultural norms, informal rules, enforcement intensity, and community networks play major roles in shaping outcomes (Agarwal, 2022). Gender emerged as the only strong and statistically significant determinant of high access. The coefficient for **FEMALE** was positive and large ($\beta = 1.557, p < 0.001$), corresponding to an odds ratio of **4.75**. This meant that women were nearly five times more likely than men to report high access to natural resources. The finding aligned with field observations and descriptive statistics where 75% of female respondents fell within the high-access category compared to only about 40% of males.

This strong gender effect reflected the nature of the resource types commonly accessed in the study area—fuelwood, fruits, mushrooms, snails, and non-timber forest products—items traditionally gathered by women as part of daily household provisioning. Similar patterns have been reported in recent studies showing that women in West African

rural communities maintain primary responsibility for NTFP collection, firewood gathering, and subsistence-level harvesting, thereby gaining more frequent and practical access to forest landscapes (IUCN, 2020; FAO, 2022). Conversely, men engaged more in hunting and lumbering—activities more regulated by park authorities—leading to comparatively lower reported access. Education had a negative coefficient ($\beta \approx -0.335$; $p \approx 0.084$), indicating that higher education levels tended to reduce the likelihood of high access, although the effect was not statistically significant at the 5% threshold. Other socio-economic variables—including age, farming status, distance to the park, income class, indigeneity, and years in the community—did not show statistically significant effects:

Table 5: Logistic Regression Estimates

Predictor	Coefficient (β)	Std. Error	Odds ratio (e^{β})	p-value
Constant	0.4784	0.7065	1.6135	0.4983
Female (1=Female)	1.5574	0.3654	4.7465	< 0.001
AGE (Years)	-0.0051	0.0135	0.9949	0.7062
Edu_Lvl (0–3)	-0.3348	0.1940	0.7155	0.0843
FARM (1=Farming)	-0.0009	0.4131	0.9991	0.9982
Dist (0,1,2)	-0.0770	0.2421	0.9259	0.7506
INCOME (₦ Midpoint)	-0.0000	0.0000	1.0000	0.5370
INDIGENE (1=Yes)	-0.2122	0.3848	0.8088	0.5814
YEARS (Midpoint)	-0.0154	0.0166	0.9848	0.3546

Sample size: $n = 160$, Log-likelihood = **-96.344**, Null log-likelihood = **-108.441**

McFadden’s pseudo- $R^2 \approx 0.112$ ($\approx 11.2\%$), **Significance** : ($p > 0.05$).

Conclusion and Recommendations

The study concluded that natural resource use around Old Oyo National Park was strongly gender-differentiated. Women depended more heavily on plant-based resources such as fuelwood, fruits, mushrooms, and NTFPs, which explained their significantly higher likelihood of reporting high access to resources. Men’s involvement centred on activities such as hunting, lumbering, and grazing, which were more regulated and thus associated with lower access scores. Although socio-economic factors such as age, income, educational level, and distance to the park influenced household livelihoods, they did not significantly predict accessibility in the logistic model. Persistent exploitation patterns, declining wildlife availability, and heavy pressure on vegetation indicated unsustainable resource use, posing long-term threats to biodiversity and community welfare.

Based on these findings, the study recommended that park authorities and policymakers adopt gender-responsive conservation frameworks that formally recognize women’s central role in forest use and environmental stewardship. Sustainable livelihood programmes such as beekeeping, small livestock production, fuel-efficient stove initiatives,

and NTFP value-addition should be introduced to reduce pressure on wild species. Community-based resource monitoring groups should be strengthened to include equitable representation of both men and women. Educational outreach and conservation awareness campaigns should be intensified, particularly among newly settled and non-indigene households. Finally, collaborative management structures linking park authorities with local communities should be expanded to promote shared responsibility, enhance compliance, and ensure long-term ecological sustainability.

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