

# **RURAL DWELLERS' USE, ATTITUDE AND PRACTICE OF FOREST RESOURCE CONSERVATION IN OGUN STATE, NIGERIA**

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## **Abstract**

This paper examines attitudes and practices of forest resource conservation among rural dwellers in Ogun State, Southwest Nigeria. The paper explored elements influencing disparities in forest resource conservation among these rural dwellers. Through stratified random sampling, three hundred (300) households were selected for questionnaire administration. Data were analyzed using frequency counts, percentages, means and Pearson-product moment correlation. The study revealed that there are numerous uses for forest resources, including those for energy and fiber production, construction, and the production of food and medicine. The study's results showed positive attitudes and practices towards forest resources conservation. Religion was found to be related to attitude to forest conservation. Also, educational background showed a positive relationship with attitudes and practice. Consequently, it is observed that forest resources are utilized in a wide range of ways. The study recommends that rural communities in Ogun State, Nigeria be exposed to holistic, community-based environmental education programmes.

**Keywords:** Rural dwellers, forest, conservation, resources, environmental education, Nigeria

## **Introduction**

Forests are a valuable natural resource covering over one-third of the earth's surface, or 4 billion hectares (FAO, 2018). From broad savannah woodlands to deep tropical rainforests, they cover many environments. They are home to some of the world's most biologically varied ecosystems (Yalew, 2015;

Adams, 2017). Forest ecosystems not only provide a variety of environmental services, such as soil and river catchment conservation, preservation of biodiversity, and prevention of climate change. They play a major role in the hydrologic cycle, soil conservation, and forest provides cover to the land surface, but also a plethora of socio-economic advantages from timber and non-timber forest products (NTFPs) as well as recreational opportunities (Wuyep, Jatau & Williams, 2022).

Human impacts leading to deforestation in the tropics threaten ecosystems that harbor 70 per cent of global plant and animal life (Gibson et al., 2011; Tucker et al., 2018). The unprecedented destruction of forests has attracted the attention of many stakeholders; this has been widely documented (Yalew, 2015; Matsvange, Sagonda & Kaundikiza, 2016; FAO, 2018). According to the FAO (2018), 31.6 per cent of forest cover globally was lost between 1990-2015, continentally, South America lost about 4.0 million hectares per year and Africa lost 3.4 million hectares annually. Country by country data revealed that the highest rates of deforestation occurred in Comoros (-9.3), Togo (-5.1), Mauritania (-2.7), Uganda (-2.6), Iceland (5.0), Kuwait (2.6), and Rwanda (2.4). However, today's forest cover is around half of what it was in pre-agricultural periods, with most of it lost in the last three decades (FAO, 2018). This decline has been attributed to factors that include changing human lifestyles, such as the transition from hunter-gathering to settled agriculture and the socio-economic demands for timber, wood fuels, fibre and urban expansion. The high rate of conversion of land to agricultural land use is heavily increasing deforestation in the tropics (Estrada, Garber & Chaudhary, 2019; Wuyep, Isha, Arin & Daloeng, 2020; Wuyep, Jatau & Williams, 2022). Similarly, Gimah and Bodo (2019) noted that agricultural expansion and practices are one major cause of deforestation, as well as socio-economic needs for lumber, wood fuels, fiber, and urban expansion, have all been blamed for the decline (Shibia, 2010; Lepetu & Gerekae, 2016). The significance of socio-cultural and demographic elements, including attitudes and behaviours as well as participation and policy awareness of rural people in forest conservation, has been recognized in the literature (Appiah, et al., 2009; Li, Wang, Liu & Weng, 2010). The study reported here was conceived as part of the growing interest in, and lack of knowledge about, the multiple driving forces behind forest resources degradation and efforts to promote sustainable forest conservation.

Forest depletion is more severe, particularly in poor areas (Barett, Travis & Dasgupta, 2011). The people who live in rural areas intend to stay in forest and savannah areas. An estimated 40% of the rural poor - around 250 million people - rely on forests to some extent. One-third of the world's population, or 2.4 billion people, use wood as a source of energy for cooking, boiling

water, and heating. In Africa, they constituted 60.1 per cent (nearly 620 million) of the total population of the continent in 2010. The use and close dependence of rural people on natural resources for their livelihood and survival are widely reported (Oyekale & Ajesi, 2011; Garekae, Thakadu & Lepetu, 2016; Iheke & Eziuche, 2016). For many rural populations who live in and around forests and rely on these resources for their daily needs, forest resources provide life support (Bakhtiari, Jacobsen, Strange & Helles, 2014; Yalaw, 2015; Garekae, et al., 2016; Talukdar & Gupta, 2018). They rely on them for food, health care, shelter, crafts, and various other necessities. Forest resources are critical to this people's economic, social, and cultural survival. Firewood, bush meat, fruits, medicinal plants, and building materials are all available in the forests. They are home to humans as well as numerous plant and animal species, many of which are threatened with extinction due to human activity (FAO, 2018). Ratsimbazafy, Harada & Yamamura (2012) noted that wildlife and biodiversity, as well as non-timber forest products such as snails, rodents, mushrooms, and edible wild fruits are source of income to households. The significance of forests to GDP is certain, however, they support both urban and rural households. There is no doubt that the bulk of Nigeria's poorest people relies directly on forest (Castilho, De Vleeschouwer, Milner-Gulland & Schiavetti, 2018).

Nigeria has been ranked among countries in the world with abundant forest resources, yet, these resources have been consumed by human activities. FAO (2005) revealed that Nigeria had the highest rate of deforestation in the world between the years 2000 to 2005. Between 1990 and 2005, Nigeria lost 35.7 per cent of forest land due to human activities (FAO, 2005). Nigeria's forests decreased gradually from 16.6 per cent in 1996 to 7.7 per cent in 2015 (Emeodilichi, 2018). The consequences of these losses are already apparent in the form of soil erosion, climate change, flooding, environmental refugees, and an outbreak of new diseases, human-wildlife conflict and loss of biodiversity. If these trends continue at their present rate, human well-being could be under even greater threat than is currently being experienced (Buba, Ayuba, Jibrin & Lawan, 2017). Nigeria's rich forest resources are extensively exploited by rural communities and are an integral part of their daily lives (Oyekale & Ajesi, 2011; Ajake & Eja, 2012; Hlang, Kamiyama, Chiho & Osamu, 2017). They offer 93 per cent of the country's energy as well as lumber and poles for construction and industry. Nigerian forest resources also provide food security and natural resources for their livelihood, with over 85 million people living in rural areas and over 60 per cent deemed poor (FAO, 2010; 2018).

However, in an attempt to reduce the effects of deforestation on livelihoods, farming households developed some adaptation strategies

(Wuyep, Jatau & Williams, 2022). Thus, it is observed that the survival attitudes caused by deforestation encouraged the development of local people's consciousness about the environment and its conservation by rural dwellers (FAO, 2009). The importance of socio-cultural and demographic factors in forest conservation, such as rural people's attitudes and behaviors, as well as their participation and policy awareness, has been highlighted in the literature (Appiah, et al., 2009; Li, Wang, Liu & Weng, 2010). Although studies on forest resources have been conducted in Nigeria (Oyekale et al., 2011; Ajake & Eja, 2012; Eneji, et al., 2012; Ukwetang, Otu & Neji, 2014), however, few have focused on the rural communities in Ogun State. There is little published information on their knowledge of as well as the attitudes and practices of the rural people towards forest resources. The study was conceived as part of the growing interest in, and lack of knowledge about, the multiple driving forces behind forest resources degradation and efforts to promote sustainable forest conservation in the State. The study was undertaken here to assess the perceived importance of attitudes towards and practices regarding forest resource conservation among selected Nigerian rural households. We compared the socio-demographic background of our sample population in the Ijebu division of Ogun state in these regards. The study addressed the following questions: (i) what importance and uses do rural people attach to forest resources? (ii) What are the attitudes towards and practices of forest resource conservation among rural people? (iii) Is there a significant relationship between socio-demographic variables, importance, attitudes and practices of forest resource conservation of rural people in Ogun State, Nigeria?

### **History of Forest Conservation in Nigeria**

Nigeria is blessed with a sizable area of forest cover, yet this valuable resource is not utilised, managed, or conserved in a sustainable manner. In the past, forestry development in Nigeria started with the reservation of forest lands for the management, upkeep, and provision of timber supplies (Ayeni, 2013). The establishment of forest reserves was a crucial step for assuring and regulating the role of forestry in economic development (Osemeobo, 1990). The colonial government started establishing forest reserves around the end of the 1800s. More than 970 square kilometers were designated for this purpose by the year 1900. The reserve had expanded to about 30,000 square kilometers by 1930, and to over 93,420 km<sup>2</sup> by 1970, largely in savanna zones. Based on these modifications, three stages in the development of Nigeria's management of its forest resources have been identified, including the reservation phase (1899 – 1930), exploitation phase (1930 – 1960), and development phase (1960 till date) (Okali & Eyog-Matig, 2004; Oyebo, 2006).

### **Forest Conservation Policies and Practices in Nigeria**

An ideal strategy for achieving the goals of reducing forest degradation and ensuring sustainable forest development is reflected in forest policy and administration (FAO, 2010). Sound forest policy, which in turn depends on complete and accurate information on the forest estate, can serve as the foundation for effective forest management. Such precise data can be obtained from a national forest program that has been effectively planned and implemented (Lorenz & Sandhovel, 2001; Ujor, 2018). The first Nigeria Forest Policy, which was approved in 1988 to achieve self-sufficiency in wood products, Nigeria's agricultural policy included the use of sound forest concepts and practices as well as the mobilization of human and material resources (Federal Ministry of Environment, 2002). These opinions were translated into expectations that the policy would specifically address some issues, such as encouraging greater rural involvement in forestry development, increasing production per unit area, improving per capita income and technical skill, particularly in the wood processing industries, encouraging a maximization of value added of forest produce, and encouraging private investments not only in the processing but also in the regeneration of the resource (Kalu & Izekor, 2006).

The 1988 National Forest Policy (NFP) was referred to as extant national forest policy, included within the document titled Agricultural Policy for Nigeria, and published in 1988 by the Federal Ministry of Agriculture, (Federal Republic of Nigeria (FRN), 2006). The policy, which was described as demand-led, provided goals, targets and implementation strategies for the management, development and use of forests and their products. This was to be achieved by amongst other measures, increasing the forest cover from 10 percent to 20 percent, as couched in the broadly stated objectives. But this objective was not realized throughout the tenure of the Policy. The 2006 National Forest Policy, which was announced in June of that year, was viewed as being ineffective because it could not be implemented without legal support (Federal Ministry of Environment, 2010).

### **Methodology**

Ogun State is located entirely within the tropics and has a land area of 16,409 square kilometers. It is bounded in the west by the Benin Republic, in the south by Lagos state and the Atlantic Ocean, in the east by Ondo state, and in the north by Oyo and Osun states. Situated between latitudes 6.2°N and 7.8°N and longitudes 3.0°E and 5.0°E, it lies within the rainforest belt and receives an annual rainfall of 1500–2000 mm. The state's tropical climate has a rainy season beginning around March and ending in November, followed by a dry season. The mean annual rainfall varies from

128 cm in the south to 105 cm in the north. The average temperature ranges from 23°C in July to 32°C in February. The northern part mainly supports savannah vegetation, while the central area, where this study was conducted, falls in the rainforest belt. The south has mangrove swamps. Administratively, the state comprises 20 local government areas with an estimated population of about 5.2 million people (National Bureau of Statistics (NBS), 2017). For this study, three communities Mamu, Ajebandele and Isanya-Ogbo were selected from three of nine local government areas that constitute Ogun East senatorial district, Ogun State, Nigeria (Fig 1).



Fig. 1: The Study Communities in Ogun State

A total of 300 hundred respondents were drawn from the three communities. One hundred respondents were selected from each rural community. A multi-stage stratified random sampling technique was used for the selection. Several criteria were used including proximity to forest i.e communities that lies within, adjacent or on the fringes of forest area, socio-economic indicator of rural area. For the purpose of the study, every fourth dwelling unit was identified and from each unit, one household was selected. One adult person between 30-65 years and one young person between 15-29years from each household was selected. Ogunyemi (1999) employed this sampling method in his study among rural communities in Ogun State.

The study used a descriptive survey technique approach. A questionnaire was used to collect quantitative data. A structured 5-point Likert 25-item questionnaire titled Forest Resources Conservation Questionnaire (FRCQ) was used to collect data from the respondents. Section A was concerned with the subjects' demographic data; section B with items testing attitudes toward forest/woodland resource conservation; section C with current forest/woodland resource conservation-related practices. Cronbach's

coefficient yielded a reliability coefficient of 0.72 for the instrument. Frequency counts, percentages, means, were utilized as descriptive and inferential statistics. In order to determine statistically the level of knowledge of the study participants, binary partitions for knowledge (low/high) and attitudes and practice index (negative/positive) were used. To determine the partitioning value of items, the maximum of each of the nominal values was divided by N where N is the sample of the study. Thus, the upper limit of knowledge/awareness was put at 2.50, while that for practices was set at 1.50. For purposes of data interpretation, mean values of 2.50 and above were deemed to indicate high knowledge/awareness and below 2.50 were regarded as implying low. Mean values of 1.50 and above were considered for positive practice. A standard deviation greater than 1.00 was taken to indicate high variability among respondents. To determine the relationship between socio-demographic variables and the importance, attitude and practices of forest resources conservation. Pearson-Product Moment Correlation (PPMC) was used, and the results are presented in the correlation matrix.

## Results and Discussions

**Table 1: Demographic profile of respondents**

	F	%
Gender		
Male	174	58.0
Female	126	42.0
Religion		
Christians	126	42.0
Muslim	144	48.0
Traditional	30	10.0
Educational Background		
No formal schooling	54	18.0
Primary Education	87	29.0
Secondary Education	102	34.0
Technical/Teacher Grade II	36	12.0
Colleges of Education/Polytechnic	18	6.0
University Education	3	1.0
Age		
Under 24 years	60	20.0
25-34years	129	43.0
35-44years	75	25.0
45-54years	24	8.0
55-64years	12	4.0

Table 1 demographic characteristics of respondents. Three hundred respondents were interviewed, of whom 174 (58%) were males, and 126

(42%) were females. Their mean age was 30 years. There was a relatively youthful population in the sampled communities, with many individuals in the 15–34-years old age group. Muslims constituted 48%, Christians 42%, whereas adherents of traditionalist religions constituted 10%. About 18% of the respondents had received no schooling, 29% received a primary school education, 34% had completed secondary education, 1% was university educated, 6% had attended a polytechnic or college of education, and 12% had been awarded technical or teachers Grade II certificates. Most of the respondents with higher education were teachers and civil servants who worked and lived in and among the communities. The household size in most societies is determined by various socio-cultural and economic values placed on the children. About 10% of the respondents were in a household of two to four persons, 34.1% in one of five to six persons, while the remaining 18.6% lived in a family group of seven and eight persons. Overall, the mean household size in the study areas was 5.47, the median 5.00 and the mode 5.00.

**Table 2: shows the responses of the participants on the importance attached to forest resources**

<i>Aspects of life</i>	<i>No opinion</i>	<i>Not important</i>	<i>Somewhat important</i>	<i>Important</i>	<i>Very important</i>	<i>Mean score</i>	<i>SD</i>
a. Wealth	1 (0.3)*	3 (1.0)	14 (4.7)	110 (36.7)	172 (57.3)	3.50	0.67
b. Recreation	6 (2.0)	28 (9.3)	132 (44.0)	95 (31.7)	39 (13.0)	2.44	0.90
c. Household economy	0 (0.0)	0 (0.0)	3 (1.0)	49 (16.30)	248 (82.7)	3.82	0.41
d. Quality of life	0 (0.0)	10 (3.3)	52 (17.3)	127 (42.3)	111 (37.0)	3.13	0.81
e. Quality of environment	0 (0.0)	4 (1.3)	52 (17.3)	92 (30.7)	152 (50.7)	3.31	0.80
f. Survival of other life forms	13 (4.3)	22 (4.3)	21 (7.0)	171 (57.0)	73 (24.3)	2.90	1.00
g. National economy	9 (3.0)	10 (3.3)	4 (1.3)	89 (29.7)	188 (62.7)	3.46	0.92

**(n=300)**

The greatest mean scores were found in (c) household economy and (a) wealth, according to the analysis in Table 2. The mean ratings for recreation (b) and survival of other living forms (f) were the lowest. As a result, it can be inferred that forest products are vital to household economies since they may be collected and sold for home



consumption and cash creation. Forests are only valuable in as much as they meet socio-economic demands. This also means that personal profits from forest resources matter far more than indirect collective benefits derived. The conclusion to be drawn from this finding is that the larger the economic and social benefits obtained from forest resources by individuals or communities, the more important the forest becomes to them.

**Table 3: Percentage of use of forest resources by households**

<i>Use category</i>	<i>%</i>	<i>Rank</i>
Fuel wood	94	1
Wood for furniture	92	2
Indigenous poles for construction	90	3
Wild animals/bush meat for food and income	90	3
Medicinal plants	86	4
Honey	84	5
Wild herbs	83	6
Grass/leaves for livestock	81	7
Edible wild fruits	78	8
Grass/twigs for sweeping	74	9
Wood for household utensils	69	10
Reeds for weaving mats	69	10
Reeds for construction	65	11
Wood for carving	64	12
Bird eggs	62	13
Mushrooms	56	14
Edible insects	61	15
Seed of rattle for decoration	53	16
Thatch grass	48	17

From the results in Table 3, forest resources are used in various ways and purposes (energy, fibre, building materials, medicine, fruit, and food). Fuel wood was the primary energy source for households in all three communities studied. Fuel wood is collected for domestic use and as a source of revenue. Food vending, cassava (garri) processing, palm oil production, and fish/bush meat smoking are all examples of small-scale processing businesses that

employ fuel wood. Restaurant proprietors are the biggest buyers of fuel wood in the study area. Nigeria is abundantly endowed with wildlife, and hunting activities are widely carried out in rural areas with little or no limitations. For food or money, 90% of the households polled hunted wild animals. Grass cutters or cane rats, rodents, bush pigs, antelopes, bush fowl, and reptiles such as snakes are among the most commonly consumed species. Wild vegetables and fruits, medicinal plants and fuel wood were the other NTFPs collected throughout the year from the forest. Firewood was the main source of energy, while non-timber forest products were collected for the household and used as food and food additives, such as edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibres (used for construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes in the study areas. This supports previous studies (Katerer, Minang & Vanhanen, 2009; Youn, 2009; Shibia, 2010; Matiku, Caleb & Callistus, 2013; CIFOR, 2014; FAO, 2018) that have indicated that natural and forest resources are an important source of sustenance and safety net for people living in or adjacent to forest areas. They are culturally significant, cheap and often accessible to local people.

**Table 4: Attitudes to forest resources conservation**

<i>Statement</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Don't know</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Mean score</i>	<i>SD</i>
<b>a.</b> Forest/woodland resources should be conserved to ensure healthy populations of all wild species of trees, plants and animals.	4 (1.3)		3 (1.0)	68 (22.7)	225 (75.0)	4.7	0.6
<b>b.</b> Forest/woodland resources have ways of regenerating themselves whether we care or not.	22 (7.3)	76 (25.3)	48 (16.0)	127 (42.3)	27 (9.0)	3.2	1.1
<b>c.</b> Protecting the job of forest industry workers is more important than protecting endangered species.	19 (6.3)	122 (40.7)	18 (6.0)	64 (21.3)	77 (25.7)	3.2	1.4
<b>d.</b> The most important objective of forest/woodland management should be to protect the environment for all.	0 (0.0)	29 (9.7)	16 (5.3)	113 (37.7)	142 (47.3)	4.2	0.9
<b>e.</b> Everyone should be concerned and do something towards protecting the forest/woodland resources.	4 (1.3)	22 (7.3)	7 (2.3)	131 (43.7)	136 (45.3)	4.2	0.9

<i>Statement</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Don't know</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>Mean score</i>	<i>SD</i>
f. It is government's responsibility alone to protect and conserve the forest/woodland resources.	28 (9.3)	22 (7.3)	21 (7.0)	142 (49.7)	47 (15.7)	2.6	1.4
g. God gave us the forest/woodlands to use in meeting our needs and we should not be denied that natural right.	4 (1.3)	30 (10.0)	35 (17.3)	88 (29.3)	143 (47.7)	4.0	1.3
h. If we want wildlife to survive, we must look after the natural places where they live.	9 (3.0)	32 (10.7)	46 (15.3)	74 (24.7)	117 (39.0)	3.6	1.5

According to Table 5, three (i.e. a, b and c) of the ten statements that were raised to capture attitudes to forest resource conservation practices among the rural inhabitants had higher mean scores than the neutral value of 3.0. Statements d–j refers to the practices that threaten forest resources and degrade the environment. These are harmful practices; the results are interpreted inversely as if they were equivalent to acceptance of the positive practice statement. The seven statements had mean scores in the range of 2.0–2.4, which, though below the neutral limit of 3.0, suggest that respondents accepted that the practices expressed in the statements are bad. Taken together, these results indicate that respondents could recognize acceptable forest resource conservation practices and those that are not. There appears to be a similarity in the pattern of responses between the attitudes and practice statements which implies a relationship between attitudes towards and practices of forest resources conservation.

**Table 6: Correlations matrix of respondents' socio-demographic variables and importance, attitude, and practice**

Variables	1	2	3	4	5	6	7	8	9
1. Sex	1								
2. Age	-.157**	1.00							
3. Religion	-.299**	-0.08	1.00						
4. Occupation	.135*	-0.04	0.03	1.00					
5. Educ. Background	-0.08	0.09	0.01	-.149**	1.00				
6. Make Livelihood from forests	-0.08	.166**	.152**	-.263**	.245**	1.00			
7. Importance	0.10	-0.03	-.167**	-0.10	0.06	0.04	1.00		
8. Attitude	.139*	-0.04	-.151**	-0.11	.240**	.157**	.235**	1.00	

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9. Practices	.138*	-.154**	-0.07	0.01	.203**	-.206**	-0.10	.145*	1.00
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The correlation matrix in Table 6 shows a weak correlation between gender, attitude, and practice. From the findings, religion was related to attitude to forest conservation. Also, educational background showed a positive relationship with attitudes and practice. The variable of making a livelihood from the forest was related to attitude and practice. This is not surprising because if an individual or a group derives a living from a particular object, one would expect them to naturally express or demonstrate some degree of attitude and practice it. This result is consistent with the findings of Paulos (2017), who reported a moderate and strong positive significant correlation between environmental knowledge and people's attitude toward natural resources. This finding is important because it suggests that increased knowledge may help improve people's forest resource conservation attitudes. It also confirms the contribution or influence of socio-economic status and cultural background variables on the environmental variables of knowledge, attitudes, interest and practices. It further suggests that education programmes can influence and modify environmental attitudes.

### **Conclusion and Recommendations**

The inevitable conclusion is that forest resources are utilized in a wide range of ways in the study area. People collect forest resources for a variety of needs and uses, including energy, fiber, building materials, medicine, fruit and food. The households surveyed in this study concluded that there are positive attitudes and practices towards conserving forest resources. Relationships were found between respondents' demographic characteristics (gender, age, level of education, occupation, and religion) and their attitude and practices toward forest resource conservation. These findings laid the groundwork for creating and implementing livelihood strategies aimed at improving and motivating our study community to conserve forest resources. These findings have implications for forest conservation in the study locations and similar populations around the region. If effective and efficient utilization of forest resources is to be promoted, if sustainable forest conservation practices are to be achieved, programmes and policies that support and strengthen households' economic status are necessary. Since forests are the most important resource for the rural people and serving a source of their livelihood, community-based environmental education initiatives should be put in place by government agencies and non-governmental organization to provide the people with information on policies and more effective utilization of forest resources for sustained supply.

Domestication of some of the NTFPs should be promoted and encouraged. This way, women will not have to go into the forests to collect these products, except those that are difficult to raise on the farm. This would help the NTFP in the wild to be intact for prosperity. Alternative sources of energy, such as kerosene, should be provided and made available and affordable. In addition, fuel wood efficient stoves should be introduced to the people so that they can reduce the amount of fuel used to cook food or to process some of the forest resources such as bush meat and garri (a local cassava dish) for which the people of the study areas are noted. Economic empowerment programmes for women are needed since they play a significant role in collecting, processing and distributing forest resources for households and the community at large. Women should be encouraged to acquire other skills which can be used to supplement the primary activity of collecting and harvesting forest resources for income. All these suggestions can be carried out within a comprehensive community-based environmental education initiative that would promote social and environmental justice and sustainability.

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