

Evaluation of the Contributions of ISE Forest Reserve to the Livelihood of Adjoining Communities in Ekiti State, Nigeria

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Abstract

The study was carried out to evaluate the contributions of the Ise Forest Reserve to the livelihoods of adjoining communities in Ekiti State. A purposive sampling technique was used to select six communities around the forest reserve. A total of 20 respondents were randomly selected from each of the communities, resulting in a sample of 120 respondents. Data collected were analyzed using descriptive statistics. Majority of the respondents were married (78.3%), male (52.3%), with 43.2% having a secondary school education. Firewood, timber, wild animals and *Agaricus* spp ranked 1st with 100.0% among the products harvested/collected from the forest by the respondents. Products harvesting/collection methods employed by the respondents in the study area include picking, plucking, digging and uprooting. Availability of some products in the study area was seasonal, while some were available throughout the year. 22.5 % of the respondents strongly agreed that the forest reserve contributes significantly to job creation, while 45.0 % of the respondents strongly agreed that the forest reserve contributes significantly to the aesthetic value of the environment. The highest percentage (45.0 %) of the respondents strongly agreed that the forest reserve has made access to land for agricultural purposes a bit difficult, while 36.7 % of the respondents said the reserve poses a security threat as it serves as a hideout for kidnappers. Government should allocate land to the people to carry out their farming activities through taungya system and at the same time, employ more forest guards to patrol the forest to checkmate criminal activities within the forest.

Keywords: Forest Reserve, Adjoining Communities, Taungya, Herbs, Ekiti State.

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Introduction

Forest reserves are commonly defined as areas of land that are protected and managed in order to preserve a particular type of habitat and its flora and fauna which are often considered rare or endangered [1]. Forest reserves provide ways to meet local and international demand for timber, fuel (Hiemstra- van der horst and Hovorka, 2009), paper, and non-timber products, to respond to deforestation, forest degradation and climate change, and alleviate poverty and development [2-6]. While there is renewed interest from investors, governments and enterprises in the potential of reserved

forests in Africa, doubts have been expressed by communities, environmental and social NGOs and other commentators about recent impacts [3,7].

Forest reserves provide products (timber, fiber, energy, medicine and food) and environmental services (carbon, land restoration and reclamation, hydrological regulation and biodiversity and genetic resources conservation). They have multiple, positive and negative sustainability impacts (environmental, social and economic impact), which are strongly dependent upon the context in which they are reserved and

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how they are managed [8]. It is based on these importances of forests that the United Nations mandated that 25% of the land area of every country should be conserved under permanent forest cover as the minimum ecological requirement for the socio-economic survival of the country [9]. It is in compliance with the preceded mandate that forest reserves are found in different countries of the world.

Historically, forests have played a major role in influencing patterns of economic development, supporting livelihood, helping structure economic change, and promoting sustainable growth millennia before the industrial revolution, forest, woodland, and trees were the source of land for cultivation and settlement, of construction materials, of fuel and energy, and indeed of food and nutrition as well [10]. To this extent, it is necessary to continuously document the impact of forest reserves with a view to increasing their positive impact while mitigating the effect of their negative outcome.

However, in Nigeria today, forests and forest reserves have become bases and hideouts for criminals to launch attacks on travelers/tourists and local people. Many of the predicted impacts of forest reserves in the tropical area, such as ecological and rural livelihood benefits, have not materialized, and when they

do, they have not been evenly distributed locally, particularly to the disadvantage of the local poorer and customary land users [11]. Many of the predicted impacts of forest reserves in tropical areas, such as ecological and rural livelihood benefits, have not materialized, and when they do, it has been unevenly distributed locally, particularly to the disadvantage of poor and customary land users [11]. Local people living in a protected or reserve area can either be affected positively or negatively in the area of their social, economic and cultural activities. Hence, this study was therefore, carried out to assess the contribution of Ise forest reserve on the livelihoods of adjoining communities in Ekiti State, Nigeria.

Methodology

Study Area

The study area (Ise forest reserve) is located in the southern part of Ekiti State, Southwest Nigeria. The forest reserve, which is surrounded by some farm settlements, lies between Longitude $5^{\circ} 38' 04''$ and $5^{\circ} 22' 54.9''$ east and Latitude $7^{\circ} 38' 41''$ and $7^{\circ} 23' 3''$ north of the Equator. The forest which covers 13.47km lies south of Ijan-Ekiti and northwest of Ise-Ekiti, east of Ado-Ekiti and northeast of Ikere-Ekiti.

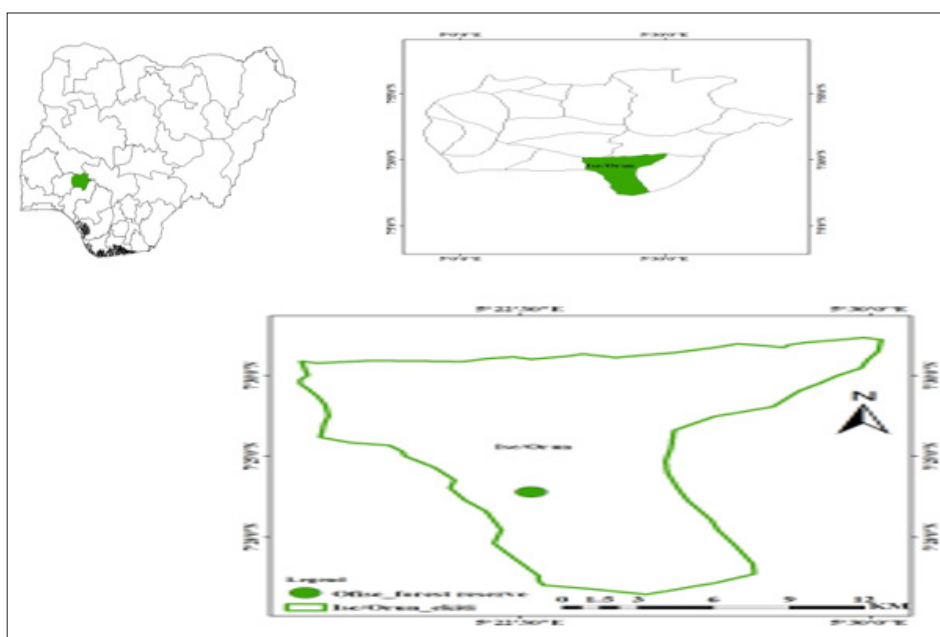


Figure 1: Location Map of the Study Area

Method of Data Collection

Purposive sampling was used to select six adjoining communities in Ise forest reserve. Twenty respondents were randomly selected from each of the communities selected thus a total of 120 respondents were selected for this study. Data were collected through the use of semi-structured questionnaire and interview to collect information on the socio-economic characteristics of the respondents, products collect from the forest and their uses, method and period of harvesting, contributions to the livelihood of people among others.

Data Analysis

Data collected were analyzed using descriptive statistics such as frequency tables and percentages. Percentage mention as used by was used to ranked the various products harvested/collected from the forest.

Results

Socio-Economic Characteristics of Respondents in the Study Area

The socio-economic characteristics of the respondents is presented in Table 1. The result showed that 52.5% were male

while 47.5% were female. The highest percentage (50.8%) of the respondents were between 51-70 years, this is followed by respondents between 31-50 years with 25.0%, while the least (3.3) were above 70 years. The result also revealed that majority (78.3%) were married, 15.8% were single, while 4.2% and 1.7% were divorced and widowed respectively. The result showed that 48.3% of the respondents had household size between 1-3, 42.5% had household size between 4-6 while 9.2% had household size above 7. Furthermore, the result showed that majority (43.2%) of the respondents had secondary school education, this is followed by primary education with 30.8%, this is followed by tertiary education with 20.8% while the least (5.0%) had no formal education.

Table 1: Socio-Economic Characteristics of Respondents in the Study Area

Variables	Frequency (n=120)	Percentage (%)
Gender		
Male	63	52.5
Female	57	47.5
Age (Years)		
≤30	25	20.8
31-50	30	25.0
51-70	61	50.8
≥70	4	3.4
Marital Status		
Single	19	15.8
Married	94	78.3
Divorced	5	4.2
Widowed	2	1.7
Household Size		
1-3	58	78.3
4-6	51	42.5
>7	11	9.2
Educational Background		
No Formal Education	6	5.0
Primary Education	37	30.8
Secondary Education	52	43.2
Tertiary Education	25	20.8

Products Harvested/Collected by Respondents in the Study Area

The results of the types of products harvested/ collected from the forest, uses of the products, methods of harvesting and period of harvesting by respondents in the study area is presented in Tables 2,3,4 and 5 respectively. Table 2 presents the result on the products harvested/collected in the study area. The result revealed that firewood, timber, wild animals and Agaricus spp ranked 1st with 100.0%, herbal plants ranked 2nd with 95.8% while Aframomum melegueta ranked 21st with 18.3%. Table 3

presents the various parts of the products collected/harvested and their respective uses. The result revealed that most parts harvested/collected were the leaves, fruits, roots, skins bark among others which were used for different purposes such as herbs, soups, shelter, firewood, sawn wood.

Table 4 presents the method of harvesting/collection of forest products in the study area. The study revealed that plucking, picking, uprooting, cutting among others were the various ways of harvesting/collection of products from the forest in the study area.

Table 5 presents the period of product harvesting/collection in the study area. The study showed that the various products were collected at different period and season of the year.

Table 2: Distribution of Product Harvested/Collected from the Forest in the Study Area

Local Name	Scientific Name/ Common Name	No of Time Mention	Percentage % Mention	Rank
Igi idana	Firewood	120(120)	100.0	1st
Gedu	Timber	120(120)	100.0	1st
Eran igbe	Wild animals	120(120)	100.0	1st
Osu/Olu	Agaricus spp.	120(120)	100.0	1st
Agbo	Herbal plants	115(120)	95.8	2nd
Igbin	Archantina marginata	105(120)	87.5	3rd
Ewe iran	Thaumatococcus danielli	89(120)	74.2	4th
Emu	Raffia hookeri	82(120)	68.3	5th
Rorowo	Senecio biafrae	82(120)	68.3	5th
Ira	Bridelia ferruginea	70(120)	58.3	6th
Apon	Irvingia wombulu	68(120)	56.7	7th
Oro	Irvingia garbonensis	65(120)	54.2	8th
Agbalumo	Chrysophllum albidum	62(120)	51.7	9th
Iru	Parkia biglobosa	57(120)	47.5	10th
Ewuro	Vernonia amygdalina	56(120)	46.7	11th
Orogbo	Garcinia kola	54(120)	45.0	12th
Oyin	Apis mellifera (Wax)	45(120)	37.5	13th
Awusa	Plukenetia conophorum	42(120)	35.0	14th
Ario	Monodora myristica	38(120)	31.7	15th
Iyere	Piper guineense	32(120)	26.7	16th
Arindan	Tetrapleura tetraptera	31(120)	25.8	17th
Osun	Pterocarpus osun	29(120)	24.2	18th

Eriru	Xylopia aethiopica	28(120)	23.3	19th
Atale	Zingiber officinale	25(120)	20.8	20th
Atare	Aframomum melegueta	22(120)	18.3	21st

Table 3: Products Harvested/Collected from the Forest and their Uses

S/N	Products	Part Used	Specific Uses
1	Irvingia wombulu	Fruit, leaf, bark, wood and root	Soup, herb, fuelwood, sawnwood
2	Plukenetia conophorum	Seed, leaf and root	Food, herb
3	Bridelia ferruginea	Bark, leaf and wood	Soup, herb fuelwood
4	Parkia biglobosa	Fruit, wood, seed, bark	Seasoning, fuelwood, food, herb
5	Firewood	Wood	Cooking
6	Raffia hookeri	Palm wine, palm fronds	Beverage, broom, shelter
7	Timber	Wood	Construction, furniture fuelwood
8	Wild animals	Meats, skin	Food, leather, medicine
9	Chrysophllum albidum	Fruit, wood	Food, fuelwood
10	Garcinia kola	Fruit and leaf	Snacks, anti-venom
11	Archantina marginata	Meat, shell	Food, calcium supplement, cultural use
12	Agaricus spp.		Soup
13	Apis mellifera (Wax)	Honey, honey comb	Food, wax, medicine
14	Piper guineense	Seed, leaf	Pot herb
15	Vernonia amygdalina	Leaf, wood	Food, medicine, chewing stick, stakes
16	Xylopia aethiopica	Fruit, wood	Pot herb
17	Zingiber officinale	Corm	Food, Spices, Medicine
18	Senecio biafrae	Leaf	Vegetable
19	Thaumatococcus danielli	Leaf, Straw	Wrapping, construction
20	Tetrapleura tetraptera	Fruit, leaf, wood	Pot herb, fuelwood
21	Aframomum melegueta	Seed, Leaf	Spices, medicine, cultural use

22	Monodora myristica	Seed	Beverages, oil production
23	Pterocarpus osun	Bark, wood, leaf	Cultural, Pot herb, fuelwood
24	Irvingia garbonensis	Fruit, wood, leaf	Soup, herb, fuelwood, sawn wood
25	Herbal plants	Leaf, Bark, Root	Pot herb, charms

Table 4: Methods of Product Harvesting/Collection from the Forest in the Study Area

S/N	Products	Harvesting/Collection Method
1	Irvingia wombulu	Plucking and picking
2	Plukenetia conophorum	Plucking and picking
3	Bridelia ferruginea	Cutting and peeling
4	Parkia biglobosa	Plucking and picking
5	Firewood	Cutting and picking
6	Raffia hookeri	Tapping
7	Timber	Cutting
8	Wild animals	Hunting
9	Chrysophllum albidum	Plucking and picking
10	Garcinia kola	Plucking and picking
11	Archantina marginata	Hunting and picking
12	Agaricus spp.	Uprooting
13	Apis mellifera	Hunting
14	Piper guineense	Plucking
15	Vernonia amygdalina	Cutting and plucking
16	Xylopia aethiopica	Picking and plucking
17	Zingiber officinale	Uprooting and digging
18	Senecio biafrae	Cutting, uprooting and plucking
19	Thaumatococcus danielli	Cutting
20	Tetrapleura tetraptera	Picking and plucking
21	Aframomum melegueta	Digging and uprooting
22	Monodora myristica	Picking and plucking
23	Pterocarpus osun	Cutting and peeling
24	Irvingia garbonensis	Plucking and picking
25	Herbal plants	Cutting, digging, peeling, uprooting, plucking and picking

Contributions of the Forest Reserve to the Livelihood of the People in the Study Area

The contributions of forest reserve to the livelihood of people in the study area is presented in Tables 6 and 7. Table 6 presents the contribution of forest reserve to job and income generation in the study area. The result revealed that 22.5 % of the respondents strongly agreed that the forest reserve contributes significantly to job creation in the study area while 20.0% strongly disagree.

The result further showed that 34.2% of the respondents agreed that the forest reserve contributes significantly to their livelihood in terms of income generation. On product and other activities, 39.2% and 37.5% of the respondents strongly agreed that the reserves provide an array of non-timber products and support other activities like farming and beekeeping respectively. Table 7 presents the contribution of forest reserve to environmental and infrastructural development in the study area. The result showed that 45.0 % of the respondents strongly agreed that the forest reserve contributes significantly to the aesthetic value of the environment, while only 4.2 % strongly disagree. The result further shows that 38.1 % of the respondents strongly agreed that the forest reserve enhances the education of the inhabitants of the adjoining communities, while 36.7% of the respondents strongly agreed that the reserve has contributed to the infrastructural development of the area and 35.0 % agreed that it has the potential to contribute more in the future.

Table 5: Period of Products Harvesting/Collection in the Study Area

S/N	Products	Period / Season											
		Wet			Dry							Dry	
		J	F	M	A	M	J	J	A	S	O	N	D
1	Irvingia wombulu												
2	Plukenetia conophorum												
3	Bridelia ferruginea												
4	Parkia biglobosa												
5	Firewood												
6	Raffia hookeri												
7	Timber												
8	Wild animals												
9	Chrysophllum albidum												
10	Garcinia kola												
11	Archantina marginate												
12	Agaricus spp.												
13	Apis mellifera												
14	Piper guineense												
15	Vernonia amygdalina												
16	Xylopia aethiopica												
17	Zingiber officinale												
18	Senecio biafrae												
19	Thaumatococcus danielli												
20	Tetrapleura tetraptera												
21	Aframomum melegueta												
22	Monodora myristica												
23	Pterocarpus osun												
24	Irvingia garbonensis												
25	Herbal plants												

Table 6: Contribution of the Forest Reserve to Job Creation and Income Generation

Variables	SA	A	N	SD	D
The forest reserve contributes significantly to job creation.	27 (22.5%)	20 (16.7%)	25 (20.8%)	24 (20.0%)	24 (20.0%)
The forest reserve increases income of the people in surrounding communities	35 (29.2%)	41 (34.2%)	9 (7.5%)	12 (10.0%)	23 (19.2%)
The forest reserve has provided arrays of non-timber products such as firewood, snail, games etc.	47 (39.2%)	26 (21.7%)	31 (25.8%)	7 (5.8%)	9 (7.5%)
The forest reserve supports other activities such as farming, beekeeping, animal grazing etc.	45 (37.5%)	26 (21.7%)	22 (18.3)	3 (2.5%)	24 (20.0%)

Note: SA- Strongly Agree, A- Agree, N- Neutral, D- Disagree, SD-Strongly Disagree

Table 7: Contribution of the forest reserve to environmental and infrastructural development

Variables	SA	A	N	SD	D
The forest reserve improves the aesthetic values of the environment	54 (45.0%)	28 (23.3%)	19(15.8%)	5 (4.2%)	14 (11.7%)
The forest reserve has enhanced the level of education and other related services in the area	46 (38.3%)	20 (16.7%)	9 (7.5%)	22 (18.3%)	23 (19.2%)
The forest reserve helps in bringing infrastructural development to the surrounding communities	44 (36.7%)	41 (34.2%)	27 (22.5%)	0 (0.0%)	8 (6.7%)
The forest reserve will bring more benefits to the surrounding communities in the future	37 (30.8%)	42 (35.0%)	20 (16.7%)	12 (10.0%)	9 (7.5%)

Note: SA- Strongly Agree, A- Agree, N- Neutral, D- Disagree, SD-Strongly Disagree

Adverse Effects of the Forest Reserve on the Adjoining Communities in the Study Area

Table in table 8 presents the adverse effects of forest reserve on the adjoining communities in the study area. The result showed that 37.5% of the respondents strongly disagreed that the forest reserve has led to the loss of cultural heritage while 16.7% agreed. The result further showed that 45.0% of the respondents strongly agreed that the forest reserve has made access to land for agricultural purposes a bit difficult while 29.2% agreed. Furthermore, the result showed that 34.2% of the respondents disagreed that the presence of the reserve increases safety risk, while 43.3% of the respondents strongly agreed that the presence of the reserve denied them access to non-timber forest products. 36.7% of the respondents agreed that the forest poses a security threat as it serves as a hide out for kidnappers.

Table 8: Negative effects of the forest reserve on the respondent's livelihood.

Variables	SA	A	N	SD	D
The reserve has led to the loss of local culture.	17 (14.2%)	20 (16.7%)	9 (7.5%)	45 (37.5%)	29 (24.2%)
The forest reserve has made access to arable land a bit difficult	54 (45.0%)	35 (29.2%)	19 (15.8%)	3 (2.5%)	9 (7.5%)
The forest reserve has increased health and safety risks such as fire outbreak	12 (10.0%)	9 (7.5%)	28 (23.3%)	30 (25.0%)	41 (34.2%)
The forest reserve has denied people free access to non-timber forest products.	52 (43.3%)	47 (39.2%)	15 (12.5%)	0 (0.0%)	6 (5.0%)
The forest reserve causes environmental pollution through logging.	30 (25.0%)	34 (28.3%)	30 (25.0%)	17 (14.2%)	9 (7.5%)
The forest reserve poses a serious security risk as a hideout for kidnappers and armed bandits	22 (18.3%)	44 (36.7%)	33 (27.5%)	12 (10.0%)	9 (7.5%)

Note: SA- Strongly agree, A- Agree, N- Neutral, D- Disagree, SD-Strongly Disagree

Discussion

The study revealed that majority of the people engaged in harvesting and collection of forest products in the study area are middle-aged and fairly aged people. These sets of age brackets are very agile and they constitute the labour force. Observation from this study shows that people in the adjoining communities of the study area appreciate the importance of the forest reserve in their lives. The study revealed that Ise forest reserve is rich in both timber and non-timber forest products. The people living in the adjoining communities harvest varieties of non-wood and wood products numbering up to 25 from the forest reserve. Some of the products identified in this study as shown in table 8 includes timber, fuel wood, *Thaumatococcus danielli*, *Xylopia aethiopica*, *Senecio bialfrae*, *Chrysophllum albidum*, *Archantina marginata* and medicinal herbs among others. The large number of products collected from this forest reserve is a proof that the reserve has a positive impact on the livelihood of the people in the adjoining communities by way of meeting their economic and household needs. This assertion is in agreement with that

of Aiyelaja et al., who reported that forest reserves provide a wide range of products simultaneously and at a different time for rural populations for their immediate house hold needs [12]. Various products collected from the reserve are non-timber forest produce and they are collected mainly for household consumption. It was observed that the products were collected for different purposes, a greater percentage of the products are consumed as food while some are used for medicinal purposes, craft (weaving), wrapping and cultural purposes. Still, some are used for sawn wood and fuel wood production (Table 3). Parts of the plant used as food are fruit bark and leaf either cooked or eaten raw. The medicinal uses of the forest products collected are majorly used for health care delivery in the study area which is in consonance with the findings of Chikamai et al., and Agbogidi and ofuoku [13,14]. The presence of the forest reserve has contributed significantly to the livelihood of people in adjoining communities by creating jobs and income generation. Under the afforestation programme of the government, people are given plots of land for farming activities through agroforestry or

taungya system. This process helps in the reforestation of the harvested portion of the forest with new and fast-grown species of trees. This assertion agrees with the studies of Makindara and Van Wilgen and Richardson that in terms of job and income generation, forest reserves, plantation forests and agroforestry create diversified employment [15,16].

Based on the result of the study, the majority of the respondents strongly agreed that the forest reserve beautifies the environment during the rainy season and also improve infrastructural development of the area through the creation of access road that links the forest to the villages and sawmill for wood processing. The result agrees with the submission of green resources (2014) that forest has created a more stable business environment and local infrastructure such as schools, roads and bridges in the east African region that leads to the town with sawmill for wood conversion and timber processing which also create employment in one way or the other [17].

The result of this study shows that the majority of the respondents said the forest reserve has affected their access to land and other resources for the people in their communities calming the forest reserve has strongly made access to land for agricultural purposes a bit difficult and at the same time denied them free access to non-timber forest products. Based on the study, majority of the respondents said the forest reserve affects the living condition of the people negatively in terms of security as it serves as hideout for kidnappers. The study also revealed that the forest reserve also experiences its negative human impact through the activities of some poachers that usually carry out illegal felling of timber and indiscriminate bush burning in the dry season while hunting for wild animals. Also, some Fulani herdsman do graze their cattle in the forest thereby causing damage to crops and samplings in the forest, illegal farming activities such as planting of Indian hemp are also noticed.

Conclusion And Recommendation

The study revealed that Ise forest reserve provides an array of non-timber forest products and also supports other activities such as farming, beekeeping animal grazing. It is therefore recommended that government should provide adequate security to combat crime perpetrated by the kidnappers who use the forest as hideout and also employ more hands to patrol the forest to checkmate criminal activities within the forest.

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