



Socio-Economic Contributions of Forest Products to Rural Livelihood: A Case Study of Aramoko Forest Reserve Ekiti-State

Olujobi O. J. (Corresponding Author)

Department of Forest Resources and Wildlife Management, Ekiti State University, P.M.B. 5363, Ado-Ekiti, Nigeria
Email: olujobioj@yahoo.com

Olajuyigbe B. J.

Department of Forest Resources and Wildlife Management, Ekiti State University, P.M.B. 5363, Ado-Ekiti, Nigeria

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Abstract

In the past, conservation effort has primarily focused on establishment of forest reserves for timber production, with minimal or no consideration to how these natural resources will help sustain or improve livelihoods of adjoining communities. This study examined the contribution of Aramoko forest reserve to the livelihoods of the adjoining communities in Ekiti State. One hundred and twenty pre-tested questionnaires were administered among the products collectors in the study area. Data collected were analysed and the result showed that 78.3 % of the respondents are married with 52.3 % of them male, while 50.8 % of the respondents aged between 51-70 years with 64.1 % having at least secondary education. Twenty-five (25) different products were collected by the respondents in the study area. These products include among others; timber with highest frequency of (120) followed by herbal plants (115), *Archantia marginata* (105), *Thaumatococcus danielli* (89), *Bridelia ferruginea* (70) and *Irvingia garbonensis* (65). The use of motor cycle accounted for 41.4 % of the respondents means of transportation, while 31.3 % of the respondents sell their product in bit at the village market. Picking, digging, plucking, cutting and uprooting were methods used for harvesting by the respondents while illegal felling (24 %) and indiscriminate bush burning (22.4 %) were the major conservation problem in the study area. Specifically, some of the products harvested are used for food, medicine, fuelwood, herbs and cultural purposes. The study recommends that research should be conducted into how these products can be artificially raised in the nursery for plantation establishment.

Keywords: Socio-economic; Conservation; Aramoko forest reserve; Adjoining communities; Ekiti state.

1. Introduction

Forests are major source of livelihood for many people particularly in developing countries, providing numerous benefits directly or indirectly to human beings. Forestry sector is one of the main pivots on which the nation's welfare is built. Thus, it serves as resource base for many forest industries providing one of the highest revenues and employment generating sectors. Forestry also has an important role in poverty alleviation in the broader definition, pertaining to capabilities, empowerment and rights. The importance of forest to mankind cannot be over emphasized.

Forests currently comprise approximately 4 billion hectares or 30 per cent of the global land base and it provides food, shelter, fuel, and other goods and services to a large portion of the world's population [1]. Approximately 1 billion extremely poor people depend on forests for part of their livelihood [2]. In rural areas of sub-Saharan Africa, forest resources are amongst the most vital components of livelihoods and development opportunity [3]. Forest resource utilization therefore is a precondition for livelihood of forested communities who do not have alternative sources of income [4].

Africa is said to have the highest percentage of people in the world that live on less than a dollar a day [5]. Over two-third of the continent's 600 million people are estimated to rely on forest products, either in the form of subsistence uses or as cash income derived from a wide range of timber and non-timber forest products (NTFPs) [6]. During the colonial period, population densities and pressure on forests at the time was low, and this gave greater latitude for tolerance and compromise. However, as human population increases over time this scenario has changed with regards to forest livelihood-systems.

The livelihoods of the people in local communities are linked to production at subsistence level. There is growing recognition that the wise and sustainable management of forest reserve requires the close involvement of all stakeholders. Community involvement in forest management can be defined by the way in which a forest is used, which groups and individuals have access to it, the timing, means and degree of access, what is removed from the forest and the manner of its removal. Forests are important in the livelihoods of local people in most developing countries. Local people depend on forests resources for various products such as fuel wood, construction materials,

medicine, and food. Globally, it is estimated that between 1.095 billion and 1.745 billion people depend to varying degrees on forests for their livelihoods [7].

The potential for sustainable livelihood development of rural dwellers is assessed by analysing assets, perceptions as well as their conservation initiatives [6]. There is limited awareness on the real contribution that forests towards achieving sustainable livelihoods and poverty alleviation as well as the impact of forest conservation on environment. This is primarily due to poor forest statistics and valuation and lack of effective advocacy. Increased attention to both There is therefore an urgent need to recognize the contribution and potential of the forest resources sector with regards to sustainable livelihoods of its adjoining communities. Conservation and livelihoods issues at international and national levels has translated into substantial changes in governance worldwide, with increased participation by relevant stakeholders in natural resources management [8].

There has been a correlation between dependence on forests for local livelihoods and successful organization, this dependence on forests includes both direct uses and income generation through the sale of forest products and services [9]. With the growing population, expansion of agriculture becomes inevitable and this was at the expense of the natural resource base [10]. With the increasing pressure on the forest reserve and the consequent near depletion, better management system must be put in place to reduce further degradation and guarantee the future of the existing forest. There is dearth of quantitative information on the role of forest resources to livelihoods and dependence to guide sustainable use. People in rural areas depend on the resources available in their environment for their livelihood.

2. Methodology

2.1. The Study Area

Aramoko forest reserve is in the western part of Ekiti State, Southwest Nigeria. The forest lies between Longitude 7° 48' and 54° 5' East and Latitude 5° 4' and 1° 78' north of the Equator. The forest lies south of Aramoko-Ekiti, and north of Ijero-Ekiti. It covers an area of about 13.47 km². The climate of the study area is of West Africa monsoonal type with dry and wet season. The dry season normally start from November through March and is characterised by dry cold wind of harmattan. The rainy season normally start from March through October with occasional strong wind and thunder storm, usually at the onset and the end of the raining season. The annual rainfall ranges from 750mm in the northern zone to 1,500mm in the southern zone, diurnal temperature ranges from 21 °C to 31°C with little variation throughout the year. Annual average relative humidity is about 90% at 7.00am and 65% at 4.00pm. The vegetation type is rain forest.

2.2. Data Collection and Analysis

Pre-tested structured questionnaire which seeks information on the socio-economics characteristic of the respondents, products collected from the forest, period of harvesting, method of harvesting, uses of the products among others was administered to thirty (30) randomly selected respondents in each of the towns (Table 1). The sample size was purposively determined. Administration of the questionnaire was by personal interview. The selected respondents were interviewed at the gate of the reserve since each of the town has entrance to the forest reserve. In some cases, especially where respondents were interviewed right inside the forest reserve, researcher's observation was used to deduce the applicable answer to some questions such as distance of the village to the forest. Data collected were analysed using simple statistical analytical techniques to produce frequency table and percentage.

Table-1. Distribution of respondents in the study area

Towns	No of respondents
Aramoko-Ekiti	30
Ijero-Ekiti	30
Ido-Ile –Ekiti	30
Erio-Ekiti	30
Total	120

3. Results

3.1. Demographic Information of the Respondents

Result in table 2 show that 52.5 % and 47.5 % of the respondents are male and female respectively. Age distribution revealed that 50.8 % of the respondents are between 51-70 years. Marital status shows that 78.3% are married while 15.8 % are single. Respondents' family size reveals that 42.5 % of the respondents have 4-6 members and 48.3 % have 1-3 members while result on educational background shows that 20.8 % are graduates of higher institution while 5 % have no formal education.

Table-2. Distribution of respondents by socio economic characteristics

Variables	Frequency	Percentage (%)
Sex		
Male	63	52.5
Female	57	47.5
Age		
≤30	25	20.8
31-50	30	25.0
51-70	61	50.8
≥70	4	3.3
Marital status		
Married	94	78.3
Single	19	15.8
Divorced	5	4.2
Widow	2	1.7
Family size		
1-3	58	48.3
4-6	51	42.5
>7	11	9.2
Education		
No formal education	6	5
Primary education	37	30.8
Secondary education	52	43.3
Post-secondary	25	20.8
Total	120	100

3.2. Harvesting /Collection Practises of Respondents in the Study Area

Result on respondents' collection status (Table 3) shows that 16.7 % are full time while 83.3 % are part time collectors while 38.3 % of the respondents visit the reserve every day with 40 % of them have been in the business for 11-20 years. The result shows that majority (48.9 %) of the respondents are farmers. Products mostly harvested by the respondents are timber, wild animal, *Agaricus spp.* and firewood with 7.2 % each.

Table-3. Distribution of respondents by harvesting practices

Variables	Frequency	Percentage %
Collection status		
Full-time	20	16.7
Part-time	100	83.3
Visit to the forest		
Everyday	46	38.3
Weekend	41	34.2
Once in two weeks	16	13.3
Monthly	6	5
Others	11	9.2
Collection Experience		
1-5 years	10	8.3
6-10 years	27	22.5
11-20 years	48	40
16-20 years	25	20.8
>20 years	10	8.3
Total	120	100
Occupation		
Artisan	39	20.7
Civil servant	21	11.2
Trading	36	19.1
Farming	92	48.9
Total	188*	100

*Multiple responses

Table-4. Distribution of respondents by product harvested from the forest

Scientific name	Frequency	Percentage %
<i>Irvingia wombulu</i>	68	4.1
<i>Plukenetia conophorum</i>	42	2.5
<i>Bridelia ferruginea</i>	70	4.2
<i>Parkia biglobosa</i>	57	3.4
Firewood	120	7.2
<i>Raffia hookeri</i>	82	4.9
Timber	120	7.2
Wild animals	120	7.2
<i>Chrysophyllum albidum</i>	62	3.7
<i>Garcinia kola</i>	54	3.2
<i>Archantia marginata</i>	105	6.3
<i>Agaricus spp.</i>	120	7.2
<i>Apis mellifera</i>	45	2.7
<i>Piper guineense</i>	32	1.9
<i>Vernonia amygdalina</i>	56	3.3
<i>Xylopi aethiopica</i>	28	1.7
<i>Zingiber officinale</i>	25	1.5
<i>Senecio bialfrae</i>	82	4.9
<i>Thaumatococcus danielli</i>	89	5.3
<i>Tetrapleura tetraptera</i>	31	1.8
<i>Aframomum melegueta</i>	22	1.3
<i>Monodora myristica</i>	38	2.3
<i>Pterocarpus osun</i>	29	1.7
<i>Irvingia garbonensis</i>	65	3.9
Herbal plants	115	6.9
Total	1,677*	100

*Multiple responses

3.3. Respondents Marketing Operations

The result on respondents marketing operation (Table 5) shows that 31.3 % of the respondents sell their products in bit, 25.3 % use scale while 23.2 sell in bundle. Majority of the respondents (51.7 %) spent between ₦500 - ₦1000 on transportation to the reserve. The result shows that 41.4 % of the respondents transport their products by motor cycle while 48 % of the respondents sell their products at the village market. Poor pricing accounted for 22.4 % of the problems encountered by the respondents, this was followed by spoilage and cost of transportation with 19.7 % each. The result that 46.6 % of the respondents make ₦151,000-250,000 annually.

Table-5. Distribution of respondent by marketing operations

Variables	Frequency	Percentage %
Mode of Selling		
Bundle	89	23.2
Bit	120	31.3
Using scale	97	25.3
All of the above	77	20.1
Total	383*	100
Transportation Cost		
<500	26	21.7
500-1000	62	51.7
1100-2000	29	24.2
>2000	3	2.5
Total	120	100
Means of transportation		
Motor cycle	115	41.4
Bicycle	21	7.5
Motor vehicle	40	14.4
Carry on head	102	36.7
Total	278*	100
Selling point		
Reserve gate	65	26.0
Village market	120	48.0
City market	53	10.2

Other state	12	4.8
Total	250*	100
Problem Encountered		
Poor pricing	118	22.4
Spoilage	104	19.7
Bad road	94	17.8
Cost of transportation	104	19.7
Total	527*	100
Average annual income (₦)		
<50,000	3	2.5
50,000-150,000	15	12.5
151,000-250,000	56	46.6
251,000-500,000	32	26.7
>500,000	14	11.7
Total	120	100

*Multiple responses

3.4. Respondents Methods and Period of Harvesting and Conservation Problems

Table 6 shows that different methods which includes digging, uprooting, plucking, cutting and picking were employed by respondents for harvesting of their products. These products were usually harvested at different period of the year from January to December (table 7). Result on conservation problem (table 8) shows that animal grazing accounted of 24 % of damage done to crops and samplings in the forest this was followed by indiscriminate bush burning (22.4 %) and illegal felling (20.7 %) respectively.

Table-6. Distribution of respondents by method of harvesting/collection

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

Table-7. Products collection/ harvesting period of the year

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

Table-8. Distribution of respondents by conservation problem

Conservation problem	Frequency	Percentage %
Indiscriminate bush burning	93	22.4
Illegal felling of trees	86	20.7
Poaching	52	12.5
Illegal farming	85	20.4
Grazing	100	24.0
Total	416*	100

*Multiple responses

3.5. Uses of the Products by the Respondents

Table 9 shows that different parts of the products which include leaf, fruits, bark, timber, root among other are harvested for different purposes. Some of the specific uses of the products include food, medicine, snacks, soup, fuelwood, herbs and cultural uses.

Table-9. Products and their uses

S/N	Products	Part Used	Specific Uses
1	<i>Irvingia wombulu</i>	Fruit, leaf, bark, wood and root	Soup, herb, fuelwood, sawn wood
2	<i>Plukenetia conophorum</i>	Seed, leaf and root	Food, herb
3	<i>Bridelia ferruginea</i>	Bark, leaf and wood	Soup, herb fuelwood
4	<i>Parkia biglobosa</i>	Fruit, wood, seed, bark	Seasoning, fuelwood, food, herb
5	Firewood	Wood	Cooking
6	<i>Raffia hookeri</i>	Palm wine, palm fronds	Beverage, broom, shelter
7	Timber	Wood	Construction, furniture fuelwood
8	Wild animals	Meats, skin	Food, leather, medicine
9	<i>Chrysophyllum albidum</i>	Fruit, wood	Food, fuelwood
10	<i>Garcinia kola</i>	Fruit and leaf	Snacks, anti-venom
11	<i>Archantia marginata</i>	Meat, shell	Food, calcium supplement, cultural use
12	<i>Agaricus spp.</i>		Soup
13	<i>Apis mellifera</i>	Honey, honey comb	Food, wax, medicine
14	<i>Piper guineense</i>	Seed, leaf	Pot herb

15	<i>Vernonia amygdalina</i>	Leaf, wood	Food, medicine, chewing stick
16	<i>Xylopia aethiopica</i>	Fruit, wood	Pot herb
17	<i>Zingiber officinale</i>	Corm	Food, Spices, Medicine
18	<i>Senecio biafrae</i>	Leaf	Vegetable
19	<i>Thaumatococcus danielli</i>	Leaf, Straw	Wrapping, construction
20	<i>Tetrapleura tetraptera</i>	Fruit, leaf, wood	Pot herb, fuelwood
21	<i>Aframomum melegueta</i>	Seed, Leaf	Spices, medicine, cultural use
22	<i>Monodora myristica</i>	Seed	Beverages, Spices, oil production
23	<i>Pterocarpus osun</i>	Bark, wood, leaf	Cultural, Pot herb, fuelwood
24	<i>Irvingia gabonensis</i>	Fruit, wood, leaf	Soup, Beverages, herb, fuelwood, sawn wood
25	Herbal plants	Leaf, Bark, Root	Pot herb, charms

4. Discussion

The involvement of high number of middle aged and fairly aged people in harvesting and collection of forest products in the study area attest to the fact these sets of age brackets are very agile and they constitute the labour force. This assertion had similarly been reported by [Olujobi \[11\]](#) and [Ogunsola, et al. \[12\]](#). The full-time collector status of most of the respondents coupled with year of experience and frequency of visitation to the forest reserve is an indication that people in the adjoining communities appreciate the importance of the forest reserve in their lives. The large number of products collected from this forest reserve is a proof that the reserve has positively impacted 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 [Ayieloja and Ajewole \[13\]](#) who reported that forest reserves provide wide range of product simultaneously and at different time for rural population for their immediate house hold needs.

Observation from the study showed that majority of the respondents sell their products in bits at the village market. The poor pricing experienced as the major problem faced by the collectors could be attributed to the poor financial status of the buyers in the village coupled with the fact that they equally have access to these products at no cost from their farms. This assertion had similarly reported by [Olujobi \[14\]](#). On the other hand, some collectors do take their collection to the city market on motorcycle or in a chartered motor vehicle for lack of storage facility and perishable nature of most of the products. This afford the collectors the opportunity to sell their products fast even at higher price since these products are widely accepted by the urban dwellers that do not have the opportunity of going into the forest.

The study revealed that availability of some products is seasonal. For instance, products like *senecio biafrae*, *irvingia gabonensis*, and mushroom, are harvested or collected during the rainy season, while products like fuelwood, timber, snail and *Thaumatococcus danielli* are harvested through the year. This seasonal availability of product helps the villagers to be productive and financially secure throughout the year. Similar assertion has been reported by [Edusah \[15\]](#). The study also revealed that the forest reserve 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. In the natural portion of the forest, illegal farming activities such as planting of Indian hemp are noticed. These are common conservation problems in most natural forest reserve in southern Nigeria. Plucking and picking method of harvesting commonly employed by the respondents in the reserve is a prove that people in the study area are conscious of conservation measure which allows for continuous production of the products.

The diversity of product collected/harvested from the forest are used for different purposes. 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. Parts of the plant used as food are fruit bark and leaf either cooked or eating raw. The medicinal uses of the forest products collected are majorly used for health care delivery in the study area. These observations are in consonance with the findings of [Chikamai, et al. \[16\]](#) and [Agdogidi and Ofuoku \[5\]](#).

5. Conclusion and Recommendation

This study has shown that different products which consist of wood and non-wood products used for different purposes were harvested/collected at different times of the year in Aramoko forest reserve. These products have contributed to the livelihood of the people of the adjoining communities of the forest estate in terms of economic, social, cultural and traditional values. The study also revealed that respondents faced some challenges in the marketing of their products; these challenges include spoilage due to perishable nature of the products and high cost of transportation. It is recommended that collectors and the consumers of the products should be educated on the ways by which these products can be conserved through sustainable harvesting practices so that their supply can be in perpetuity.

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