

# Economic Benefits of Non-Timber Forest Products Among Rural Communities in Nigeria

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## Abstract

Non-Timber Forest Products provide enormous benefits to rural dwellers in Nigeria. These are open-access resources which are often exploited with limited restraints and therefore stand the risk of abuse and over-exploitation by the gatherers. This study therefore examined the various benefits and uses of some of these non-timber forest products in the rural communities. There are 750 samples for the study and data were collected by simple random sampling technique. Descriptive and budgetary analytical methods were used. Results indicated that the annual total revenue from snails/mushrooms/teak leaves was the largest while the least revenue was obtained from mushroom. The total annual gross margin was highest for snails/mushrooms/teak leaves combinations and was least for mushrooms. The net income is also highest for snails/mushrooms/teak leaves combination and was least for mushrooms alone. The estimated values for the rate of return on investment and profitability index for snails/mushrooms/teak leaves stood at 11.62 and 0.92 respectively. Rural dwellers need to protect and preserve the natural forests so that they can sustainably harvest the non-timber forest products for the advancement of their socio-economic status.

**Keywords:** non-timber forest products, gathering, economic benefits, rural communities, Nigeria

## 1. Introduction

Non-Timber Forest Products (NTFP) consist of naturally grown stocks of forest resources which could be processed either for household consumption or for local and external trade by the forest users. They include a wide range of edibles and non-edibles such as fruits, seeds, leaves, nuts, bush meat, roots, tubers, fibres, resins, latex, sticks, ropes, and construction materials like bamboos and rattans and a host of others. All these and others are sourced directly from the forest ecosystem for the use of man. According to Roderick and Eric (2000), NTFPs encompass a wide range of disparate and varied natural resources. It was noted that the concept is inexact and cumbersome since it is defined not by what it is, but by what it is not. Literarily speaking, NTFPs comprise any and every natural resource from the forest except timbers. This is corroborated by Wickens (1991) who noted that NTFPs are “all the biological materials (other than industrial round wood and derived sawn timbers, wood chips, wood-based panels and pulp) that may be extracted from the natural ecosystem, managed plantations, etc and be utilized within the household. These products could be marketed or have socio-cultural or religious significance. They may be gathered or harvested from a variety of life forms for subsistence as well as for local and external trade (Falconer, 1995; Lawes et al., 2004).

The NTFPs have enormous uses among rural communities in Nigeria. They added that such uses included sources of foods like fruits, nuts, honey, insects, and animals and so on. NTFPs are also used as fodders, fibres, fertilizers, medicinal extracts, construction materials, cosmetics and cultural products, natural dyes, tannin, gums, and other exudates. Other benefits include essential oils, spices, edible oils, decorative articles, horns, tusks, bones, pelts, plumes, hides and skins, on-wood ligno-cellulosic products, phytochemicals and aroma chemicals. These products are derived from a variety of sources such as plants (palms, grasses, herbs, shrubs and trees) and animals (insects, birds, reptiles and large animals) and other non-living components of the ecosystem.

Adeyoju (1975) noted that the supply (production), marketing and processing of timber were given prominent consideration with little or no attention to the non-timber forest products in Nigeria. In recent times however,

attention is now focused on Non-Timber Forest Products because of the immense benefits they provide for the advancement of man.

Non-Timber Forest Products (NTFPs) are components of the forests system that exist in nature and are generally not cultivated. They are non-timber, but can be made of wood. Rijsoort (2000) defined NTFPs as all tropical forest products (plants and animal parts) other than industrial timbers, which are harvested for human use at the level of self support or for commercial purposes. NTFPs are also described as parts of the plant that have perceived economic or consumption value sufficient to encourage their collection and removal from the forest. They are therefore those items that are harvested or removed from forest lands for private use or for resale (excluding sawn timbers, pole timbers, natural gas, oil, etc). They can also be referred to as all the resources or products that may be extracted from the forest ecosystem and are utilized within the household or are marketed or have socio-cultural or religious significance (FAO, 1990). These include plants and plant materials used for food, fuel, storage and fodder, medicine, cottage and wrapping materials, biochemical as well as animals, among others. Unlike timber-based products, NTFPs are obtained from a large variety of plant parts and are formed into a diverse set of products: leaves and twigs. These may be components of decorative arrangements, food items such as fruits, fungi, and juices, leaves and bark processed into herbal remedies or medicines. NTFPs are found in a wide variety of outlets such as health food store, pharmacy etc. People have benefitted from these plants for many generations and they have contributed significantly to both the local and regional economies all over the world. NTFPs are a dependable source of income and food supply in the rural areas. In the local, urban, national and international markets, NTFPs contribute substantially to national economic growth (Hammet, 1999; Olumide, 2009). The Nigerian rural economy is highly dependent on these forest products to generate income and to provide medical care (Osemeobo, 1991; Okafor, 1998).

It is however noted that NTFPs are continually diminishing resources as a result of their dependency on land which is usually under the pressure of depletion from agriculture and development of public infrastructures. The NTFPs constitute a critical component of food security and they are important sources of income for the rural poor in Nigeria. In many communities, people are traditionally dependent on local forest resources to provide additional income through the collection and marketing of NTFPs. Many rural dwellers, especially women, often generate their income by gathering some of these products from the nearby forest for sale. NTFPs may also have cultural significance and value (Cocks & Wiersum, 2003). This study therefore examined the economic benefits of teak leaves (*Tectona grandis*), mushrooms (*Agaricus sp.*), wrapping leaves (*Thaumatococcus danielli*) and snails (*Anomarus sp.*) and a few combinations of the products.

Table 1. Sample size per rural farming community

S/N	State	Rural Community	No of NTFPs gatherers
1	OYO	Moniya	50
		Iyana-Ofa	50
		Idi-Ayunre	50
2	OGUN	Mamu	50
		Ibogun	50
		Ayetoro	50
3	OSUN	Ikire	50
		Ifetedo	50
		Ede	50
4	EKITI	Ijero	50
		Ikere	50
		Ikole	50
5	ONDO	Ore	50
		Okitipupa	50
		Ikare	50
	TOTAL		750

All other information was obtained from various textbooks, journals, and several other sources of secondary data.

## 2. Methodology

### 2.1 The Study Area and Sampling Technique

The study area is South Western Nigeria are Moniya, Iyana-Ofa and Idi-Ayunre (in Oyo state), Ikire, Ifetedo and Ede (in Osun state), Ore, Okitipupa and Ikare (in Ondo state), Mamu, Ibogun and Ayetoro (in Ogun state) and Ijero, Ikere and Ikole (in Ekiti states) (Figure 1). The region has two (2) major ecological zones: forest and derived savannah which have implications for food production, fishery and rearing of animals. Crop production is the most popular occupation among the people of the area. Rearing of animals such as the sheep, cattle, goats, fish and poultry is also common among the households. The indigenes are predominantly Yoruba ethnic group and the major means of livelihood is agriculture. Primary data were largely used for this study. The sample consisted of the fifty (50) gatherers of Non-Timber Forest Products (NTFPs) which were randomly selected from each of the three (3) rural farming communities and the data were gathered over four months (July-October 2012). The communities were purposively selected in each of the five (5) states in south western Nigeria (Details in Table 1). Thus, there are 750 samples for the study.

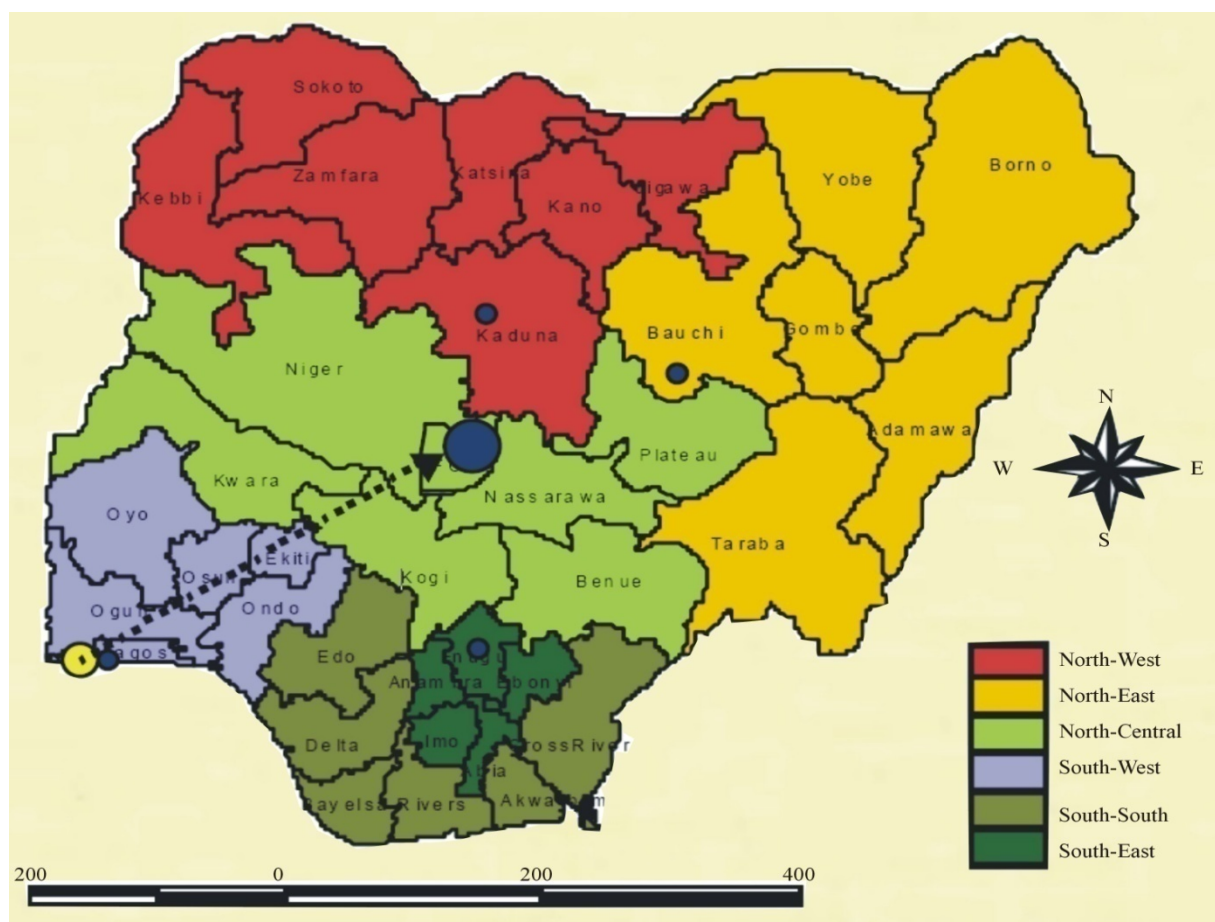


Figure 1. Map of Nigeria showing the study area in South West  
All other information was obtained from various textbooks, journals,  
and several other sources of secondary data.

### 2.2 Method of Data Analysis

Descriptive and budgetary analytical models were used for this study. Descriptive statistics comprised the use of frequency tables, percentages, means, mode and other measures of central tendency. These were used to capture the socio-economic characteristics of the gatherers of Non-Timber Forest Products (NTFPs) in the study area.

Budgetary statistical model on the other hand, was used to determine the cost and return structure of NTFPs gathering activities among the people of the area. The models are stated thus,

$$\Pi = TR - TC$$

$$TR = PQ$$

$$TC = TVC + TFC$$

$$GM = TR - TVC$$

$$NI = GM - TFC$$

$$PI = NI / TR$$

$$RRI = NI / TC \times 100$$

$$RRVC (\%) = \frac{TR - TFC \times 100}{TVC}$$

and

$$OR = TVC / TR$$

Where,

$\Pi$  = Profit

TR = Total revenue

TVC = Total fixed cost

TFC = Total variable cost

TC = Total cost

GM = Gross margin

PI = Profitability index

RRI = Rate of return on investment

RRVC = Rate of Return on variable cost

OR = Operating Ratio

### 3. Results

In Table 2 below, the socio-economic characteristics of the NTFPs gatherers were indicated. On gender, 382 (or 50.9%) of the total gatherers were female. This implies that the majority of the respondents were female. Different age groups of the rural community dwellers participate in the gathering of NTFPs. The average age of the gatherers was 42.8 years; thus implying that the gatherers are generally adults who are in their middle age and have sufficient energy to execute the task of gathering NTFPs at any given time and place. Household sizes in the study area varied between 3 and 21 with average size fixed at 12.65 (or 13) members. This has implications for the available family labour to execute NTFPs gathering activities at any time. The urge to properly cater for the essential needs of these huge family sizes also instigates the aggression for gathering activities in the forest ecosystem.

Household heads need to provide shelter, food and clothing and sometimes settle medical bills and school fees of their children and wards in the community/village schools. All these pose immense challenges to the rural dwellers and hence the endless urge to continue to ravage the forest ecosystem in search of NTFPs for survival. Several of these NTFPs are being continually harvested by the rural dwellers to generate income, serve as sources of food and occasionally serve as gift items to friends and family members. However, snails and mushrooms constituted the largest proportion (27.47%) of the NTFPs gathered by the rural dwellers. It was also noted that those gatherers that took interest in snails, mushrooms and teak leaves (combined) constituted only 2.13 % of the total number of gatherers (Table 2).

Table 2. Socio-economic characteristics of NTFPs gatherers

S/N	Variable	Frequency	Percentage	Cum.%
1	Gender:			
	Male	368	49.1	49.1
	Female	382	50.9	100.0
	Total	750	100	100
2	Age (Years):			
	Below 30yrs	86	11.47	11.47
	30-40 yrs	156	20.80	32.27
	41-50 yrs	389	51.87	84.14
	51-60 yrs	75	10.00	94.14
	Above 60 yrs	44	5.86	100.00
	Total	750	100	100
3	Household size:			
	Below 5 members	81	11.6	11.6
	5-10 members	122	16.27	27.87
	11-15 members	277	36.93	64.80
	16-20 members	206	27.47	92.27
	Above 20 members	58	7.73	100
	Total	750	100	100
4	NTFPs gathered:			
	Snails only	108	14.40	14.40
	Mushroom only	134	17.87	32.27
	Snails & mushrooms	206	27.47	59.74
	Teak leaves	88	11.73	71.47
	Wrapping leaves	194	25.87	97.34
	Teak leaves & wrapping leaves	104	13.87	111.21
	Snails/mushrooms/Teak leaves	16	2.13	113.34
	Total	750	100	113.34

Source: Field Survey, 2012.

The cost and return structure for NTFPs gathering activities was given in Table 3. On the whole (All Farms), snails, mushrooms, snail/mushrooms, teak leaves, wrapping leaves, teak leaves/wrapping leaves, snails/mushrooms/teak leaves were the various combinations of NTFPs that were gathered in the surveyed rural communities. The annual total revenue from snails/mushrooms/teak leaves was the largest (N2, 230, 438) while the least revenue was obtained from mushrooms (N512, 000).

Table 3. Cost and return structure of NTFPs gathering activities (all farms)

Variable	Non-Timber Forest Products						
	Snails	Mushrooms	Snails/mushrooms	Teak leaves	Wrapping leaves	Teak leaves/wrapping leaves	Snails/mushrooms/Teak leaves
Total Revenue	1,584,006	512,000	2,114,714	1,198,000	1,222,800	1,650,320	2,230,438
Var. Costs:	83,400	0	45,000	0	24,500	75,000	35,000
Water	350,400	155,480	133,200	334,900	277,960	313,600	27,000
Transport	289,560	61,180	72,050	221,200	417,200	370,000	18,700
Labour							
Total Variable Cost	723,360	216,660	250,250	556,100	302,460	758,600	80,700
Fixed Cost	392,400	35,300	41,000	116,000	92,000	166,000	96,000
Total Cost	1,115,760	251,960	291,250	672,100	394,460	924,600	176,700
Gross Margin	860,640	295,340	1,864,464	641,900	920,340	891,720	2,149,738
Net Income	468,240	260,040	1,823,464	525,900	828,340	725,720	2,053,738
Rate of Return on Investment	0.420	1.032	6.261	0.782	2.099	0.785	11.620
Profitability Index, PI	0.296	0.508	0.862	0.439	0.677	0.440	0.921

Source: Field Survey, 2012

In Table 4, the various uses of NTFPs were discussed. These forestry products were gathered either for food, medicinal herbs, compost manure or wrapping (or packaging) of food items. Some were offered for sale or presented as gift items to friends and/or family members. Snails were largely (52.67%) consumed as food, used in medicinal preparations (11.33%), sold (27.73%) or presented as gift items (8.27%). Mushrooms were also largely consumed (52.4%) or sold (35.33%).

Table 4. Uses of NTFPs by the gatherers

NTFPs	Food	Medicinal Herbs	Compost Manure	Wrapping (Packaging)	For Sale	Gift
Snails	395(52.67)	85(11.33)	0(0.0)	0(0.0)	208(27.73)	62(8.27)
Mushrooms	393(52.4)	15(2.0)	45(6.0)	0(0.0)	265(35.33)	32(4.27)
Teak leaf	0(0.0)	25(3.33)	35(4.67)	344(45.87)	311(41.47)	35(4.66)
Wrapping leaf	0(0.0)	0(0.0)	0(0.0)	485(64.67)	197(26.27)	68(9.06)

Source: Field Survey, 2012.

Note: Figures in parentheses are percentages of usage of NTFPs by the gatherers.

It needs to be stated that the gatherer households obtained varying incomes (returns) from the gathering of NTFPs in the rural enclave. These resources, considered individually brought extra revenues ranging from N2, 400.00 to N30 000.00 to the gatherer households (Table 5). All gathering activities took place during raining season (July-October, 2012) when all these forest resources are abundantly available.

Table 5. Daily Average Quantities of NTFPs Gathered per Household

NTFP	Average Daily Harvest	Estimated Daily Returns (₦)
Snails	25 pieces	25 pieces @ N300/unit=N7500
Mushrooms	8 baskets	8 baskets @ N300/basket=N2400
Teak Leaves	20 bundles	20 bundles @ N1,500/bundle=N30,000
Wrapping Leaves	12 bundles	12 bundles @ N2,000 /bundle=N24,000

However, diversification of the gathering activities which entails the combination of two, three or more NTFPs being gathered by the rural households further enlarged their income opportunities.

#### 4. Discussion

The dominance of female gatherers might be due to the relatively simple nature of the NTFPs gathering activities in the surveyed rural areas. This is unlike other farm jobs such as soil tillage, making of ridges, seed or seedling planting, weeding and a lot of other farm activities which men dominate. Many of the gatherers are adults who have various obligations towards family members and themselves. This imposes greater responsibilities on these gatherers.

Relatively small income is realized from the mushrooms because of the limited market supply of mushrooms (particularly during dry seasons), and other edaphic factors such as soil humidity, PH level, temperature, and texture. However, the cost items included transportation, labour and water supply, particularly for the snails and mushrooms, wrapping leaves, teak leaves and others.

The total annual gross margin was highest (N2, 149, 738) for snails/mushrooms/teak leaves combinations and was least for mushrooms (N295, 340). The net income is also highest for snails/mushrooms/teak leaves combination (N2, 053, 738) and was least for mushrooms alone (N260, 040). The estimated values for the rate of return on investment and profitability index for snails/mushrooms/teak leaves which stood at 11.62 and 0.92 respectively again confirmed that it is economically rewarding for the rural dwellers to participate in these activities, especially as they make little or no capital investment in those business ventures. It is however interesting to note that forest resources in the rural areas are generally considered and treated as “open-access” resources which the rural dwellers could explore at anytime without any serious restrictions. This could lead to over-exploitation if not chequered, especially by government policy framework on forestry and natural resources.

Teak leaves and wrapping leaves (*Thaumatococcus danielli*) were largely used for packaging food and other consumable items like colanuts. This corroborates an earlier position maintained by Aina (2012) when he noted that 55% and 59.2% of the respondents used teak leaves and wrapping leaves (*Thaumatococcus danielli*) for packaging food items and cola nuts for sale.

The Nigerian forests have a huge bundle of non timber forest products that provide numerous economic benefits particularly to the rural dwellers. These products, which are unevenly distributed over the rural landscape are major sources of income, food and fibre for the rural poor. In this study therefore the researcher examined the underlining economic benefits of some of the non-timber forest products in selected rural communities in south western Nigeria. Different age groups of the rural dwellers participate in the harvesting of these forestry products which is noted to be dominated by female gatherers. Unchequered exploitation of the forests, which is often regarded as an open access (free for all) resource, should be protected by government policy framework on forestry and natural resources. This is consistent with the earlier position held by Adeyolu (1975) and Olayide (1981). Modern methods of production technology should also be developed to domesticate some of these resources (particularly snails and mushrooms) as the survival of some of these products is continually being threatened in their natural ecosystem. This effort has yielded some notable success in beekeeping (apiculture) in Nigeria within the last two decades.

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