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Survey of Identified Non Timber Forest Products and Their Role in the Rural Livelihood of Inhabitants of Omo Forest Reserve, Ogun State

Farinola L. A.*, Famuyide O. O., Nosiru M. O., Ogunsola A. J.

Forest Economics and Extension Department, Forestry Research Institute of Nigeria, P.M.B. 5054, Jericho, Ibadan, Oyo State, Nigeria

Abstract This paper surveyed and identified Non-Timber Forest Products (NTFPs) and their role in the rural livelihood of inhabitants of Omo Forest Reserve in Ogun State. Multistage sampling method was used to select four villages each of the four (J1, J3, J4 and J6) administrative areas of the forest reserve. A well-structured questionnaire was used to obtain primary data from twelve randomly selected respondents (collectors and marketers) in each of the selected villages. A total of 192 copies of the questionnaire were administered to respondents. The biological based NTFPs (Snail, Sponge, Chewstick, Kolanut, Hunting animals (Grasscutter, Giant rat, Bush fowl/Antelope), Teak leaves, Arborea leaves and Bamboo tree) and the non-biological NTFPs (which include sand) were identified as the major NTFPs available in the study area. Information gathered includes identification and economic importance of NTFPs as it contributes to the livelihood of inhabitants of Omo forest reserve. Result shows that majority of the respondents were female, the mean age of respondents was 47 years, 83.3% of the respondents had at least primary education, mean household size was 7 and that majority (about 43%) of the respondents were NTFPs traders. Marketable NTFPs can provide an important means for economic growth and sustainable forest management in local communities. Basic information regarding NTFPs is necessary for communities to make optimal use of their natural resource. It is therefore important to have knowledge about NTFPs since they can be developed as a means to economic growth and forest resource conservation.

Keywords Rural Livelihood, Non-Timber Forest Products

1. Introduction

Non-Timber Forest Products (NTFPs) such as bamboo, seeds, leaves, rattan, raffia, and other fibres contribute immensely to the subsistence, daily life and welfare of people all over the world especially in rural economies of the developing world. (Mahaptara and Mitchell, 2011; Aiyeloja and Ajewole, 2006). Andel (2006) maintained that millions of people especially those living in rural areas in developing countries collect these products daily and many regard selling NTFPs as a means of earning a living (Agbogidi 2010).

"Eighty percent of the developing world relies on Non-Timber Forest Products for nutritional and health needs (FAO, 2003)". Forests have been valued for many products and benefits they provide (i.e. food, fodder, medicine, fuel wood, timber, etc) and as a source of income from harvesting, processing and trade in these items (Tewari, 2012). Millions of households in developing countries and in Nigeria particularly depend on various products other than timber and other industrial round wood i.e. Non-Timber Forest Products (NTFPs) which have always constituted a large part of the forest economy (Neumann and Hirsch 2000; Ahenkan *et al*., 2011). The use of non-timber forest products (NTFPs) is as old as human existence (Aiyeloja and Ajewole, 2006). In subsistence and rural economies the role and contributions of NTFPs in the daily life and welfare of people all over the world are crucial because of their richness of variety, as sources of food for example fruits, nuts, honey, insects, animals etc. fodder, fibre, fertilizers, medicinal extracts, construction materials, cosmetic and cultural products, natural dyes, tannin, gums, resins, latex and other exudates, essential oils, spices, edible oils, decorative articles, horns, tusks, bones, pelts, plumes, hides and skins, non-wood lignocellulosic products, phytochemicals and aroma chemicals. Therefore, this study seeks to identify the various NTFPs in the study area and their importance as they contribute to household economies.

* Corresponding author:
adetejuf@yahoo.com (Farinola L. A.)
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2. Methodology

2.1. Study Area

The study was carried out in Omo Forest Reserve (OFR), the largest forest reserve in Ogun State covering 1368.06km^2. The reserve is located in Southwest, Nigeria (6°90'N, 4°20'E) and situated in the Ijebu East and North Local Government areas of the State. OFR is one of the few remaining large blocks of high forest in Nigeria. The forest estate has an estimated distance of about 20 kilometers (km) from the Atlantic coast in its southern-most parts (Ogunleye, 2001). The reserve was created in 1925 and administratively divided into four areas. These are areas J1, J3, J4 and J6. The exploitation of both timber and Non-timber products are going on in the reserve. Other socio-economic activities being carried out in the reserve include farming, hunting, fishing, saw milling and trading. The reserve is a centre for research and educational activities.

2.2. Sampling Procedure and Data Collection

A multi-stage sampling technique was employed in the selection of the respondents for this study. The first stage is the purposive selection of Omo Forest Reserve. The selection was because it is the largest forest reserve in Ogun State where the collection and marketing of NTFPs for sale are a major pre-occupation throughout the season. The second stage involved random selection of four villages in each of the area J1, J3, J4 and J6 of the forest reserve. The third stage was random selection of twelve (12) households from each village. In all, a total of 192 respondents were therefore sampled and used for the analysis.

This study employed descriptive statistics such as percentages and frequency distributions.

3. Results and Discussion

From the field survey, it was revealed that about 62% of the respondents were female while 38% were male. This show more female participates in NTFPs collection and marketing. Age distribution of respondents shows that Eighty nine percent of the respondents were between 31 to 60 years of age while only 5.7% were above 60 years. The mean age was found to be 47 years. This is an indication that most of the collectors of NTFPs were still within the active age group and could easily move around to source for the NTFPs. It was observed from the survey that 90.62% of the respondents were married while 3.65% and 5.73% of the respondents were single and widowed respectively. This implies that majority of the respondents have someone to cater for, hence improve productivity. It was discovered that 16.7% of the respondents had no formal education. 83.3% of the respondents had at least primary education. This implies that the most of the respondents were educated. It is shown that about 42% of the respondents within the study area were Christian while 52.6% and 5.21% were Muslim and Traditional believers. This revealed that the area is dominated by Muslim. It was shown that about 26% of the respondents had household size of more than eight people, while majority (67.2%) of the respondents had household size between 4-8 people. The mean household size was 7.3, implying that on the average there are as many as seven members per household. The household size also contributes to significant reduction in the percentage of NTFPs sold by respondents. The result also shows that majority (about 43%) of the respondents were NTFPs traders while only 21.9% of the respondents engaged in farming as primary occupation. Respondents that were civil servants accounted for 29.7%. This implies that there is diversification of different means of livelihood in the area.

Table 1. Socio-economic Characteristics of the Respondents

Socio-economic characteristics	Frequency	Percentage
Gender		
Male	73	38.02
Female	119	61.98
Total	**192**	**100**
Age (years)		
<30	10	5.21
31-40	37	19.27
41-50	72	37.50
51-60	62	32.29
>60	11	5.73
Total	**192**	**100**
Marital status		
Married	174	90.62
Single	7	3.65
Widowed	11	5.73
Total	**192**	**100**
Education		
No formal	32	16.67
Primary	77	40.10
Secondary	62	31.25
Tertiary	23	11.98
Total	**192**	**100**
Religion		
Christian	81	42.19
Islamic	101	52.60
Traditional	10	5.21
Total	**192**	**100**
Household Size		
1-3	14	7.29
4-8	129	67.19
>8	49	25.52
Total	**192**	**100**
Primary Occupation		
Farming	42	21.88
NTFPs Trading	82	42.71
Civil servant	57	29.69
Others	11	5.72
Total	**192**	**100**

Source: Field survey, 2013

3.1. Identified NTFPs and Their Economic Importance

The NTFPs in Omo forest reserve contributes largely to the well-being of the rural inhabitants. Snail, Sponge, Chewstick, Kola nut, Sand, Hunting animals (Grasscutter, Giant rat, Antelope), Teak leaves and Arborea leaves and Bamboo tree were identified as the major NTFPs available in the study area. These NTFPs are sold in the local market and in the neighbourhood either directly to consumers or to the processors or manufacturers or to the middlemen. These middlemen were mainly women from neighbouring villages who transport the products to urban markets and sell them to wholesalers and retailers. These products and their economic importance are described below.

- **Kolanut**

Several opportunities for improved rural development are linked to non-timber forest products, one of which is kolanut which is found in large quantity within the study area.

The genus Cola belongs to the family Sterculiaceae (from which the nuts are obtained). It is indigenous to tropical Africa and has its greatest diversity in West Africa (Asogwa *et al*., 2006). Kola is one of the most popular plantation crops in Nigeria. It is widely cultivated in many tropical countries such as central and South America, Ivory Coast, Brazil and Nigeria. It is mostly cultivated in South Western Nigeria in some states like Ogun, Ondo, Ekiti, Osun and Oyo States (Ajani and Onwubuya, 2012). Kola-nut is a tropical tree crop with over 20 species, out of which, *Cola nitida* (Gbanja) and *Cola acumulata* (Abata) are the two main species grown in Nigeria. *Cola nitida* however is the only kola-nut of inter-regional and international trade. While the consumption of *C. acumulata* is greatly cherished by the Yoruba of south-west of Nigeria, the people of the northern and southeast Nigeria prefer the *C. nitida*. The commodity gets very significant attention during marriage and burial ceremonies and even during everyday entertainment of important visitors where it is offered as valuable gift on such important occasions. In addition to the economic and social importance of kola-nut, it enjoys special favour with the people of northern Nigeria who have accepted the *C. nitida* as a stimulant substitute for alcoholic drinks. The place of kola-nut production before the dependence of the economy on petroleum cannot be over emphasized. Every year an increasing number of Nigerians earn their living as kola-nut producers, transporters, traders, middlemen and even as professional packing men (Ojo and Ehinmowo, 2010). Kola is an important economic cash crop to a significant proportion of Nigerian population who are involved in kola farming, trading and industrial utilisation. The cultivation of *C. nitida* in Nigeria actually began in the 19th century (Asogwa *et al*., 2006) and it is estimated that the country produces about 88% of the world's kola nuts (Mokwunye, 2009) with an annual production of 200,000 metric tonnes mostly from South Western Nigeria. Continuing, they noted that kola plays an important role in the socio -economic life of rural households and the community at large. It serves as raw materials for clothing and textile industries as well as pharmacological industries. The crop is important because of its nut ("Obi") that has important pharmacological properties (Atawodi *et al*., 2007) and also contains some active principles found in coffee and cocoa (caffeine, theobromine, kolatin) (Opeke, 2005) which prevents sleep, thirst and hunger and also acts as an anti-depressant (Mokwunye, 2009). Kolanuts also have industrial usage for the production of drugs, soft drinks, wines, candies and beverages (Jaiyeola, 2001). Kola nuts are often used to treat whooping cough and asthma. The caffeine present acts as a bronchodilator, expanding the bronchial air passages. The economic importance of kolanut cannot be underestimated, especially in the area of poverty alleviation among rural people. However, while the demand is rising, the production remains low because many of the trees in Nigeria are unfruitful or have very low yield due to self and cross incompatibility among trees, partial and total sterility, inefficient natural pollination, old age, field and storage pests and diseases (Adebayo and Oladele, 2012).

- **Bamboo (*Bambusa vulgaris*)**

Bambusa vulgaris, also known as Golden Bamboo, or Buddha's Belly Bamboo, is an open-clump type bamboo species (Dieter, 1999). Among bamboo species, it is one of the largest and most easily recognized (Louppe *et al*., 2008). *Bambusa vulgaris* is a species of the large genus Bambusa of the clumping bamboo tribe Bambuseae, which are found largely in tropical and subtropical areas of Asia, especially in the wet Tropics (Meredith, 2009).

Common bamboo is the most widely grown bamboo throughout the tropics and subtropics. Although mostly known only from cultivation, spontaneous (non-domesticated), escaped, and naturalized populations exist throughout the tropics and sub-tropics in and outside Asia (Louppe *et al*., 2008). *Bambusa vulgaris* has a wide variety of uses, including the stems used as fuel and the leaves used as fodder, the worldwide production and trade of *B. vulgaris* is considerable, though no statistics is available. It is widely used as an ornamental plant, and is very popular as that. It often is planted as fences and border hedges. It is also planted a measure for erosion control. It is used as raw material for paper pulp; Studies have shown that paper made from *B. vulgaris* has exceptional tear strength, comparable to paper made of softwood. It can also be used to make particle boards and flexible packaging grade paper.

The stems or culms of *B. vulgaris* are used for fencing and construction, especially of small temporary shelters, including flooring, roof tiles, panelling, and walls made wither with culms or split stems. The culm is used to make many parts of boats including masts, rudders, outriggers, boating poles. It also is used to make furniture, basketry, wind-breakers, flutes, fishing rods, tool handles, stakes, weapons, bows for fishing nets, smoking pipes, irrigation pipes, distillation pipes, and more.

Golden bamboo is considered in many traditions across Asia to have medicinal value. There are many uses found in

herbal medicine, though the effects are not clinically proven. In Java, water stored in golden bamboo tubes is used as a cure of various diseases. In the Congo, its leaves are used as part of a treatment against measles; in Nigeria, an infusion of macerated leaves is taken against sexually transmitted diseases and as an abortifacient.

• ***Gmelina arborea* Leaves**

Gmelina arborea Roxb. (White teak) is an unarmed, moderately sized to large deciduous tree, about 30 m or more in height and a diameter of up to 4.5 m. *Gmelina* produces high-quality wood, which is harvested for the manufacture of furniture and musical instruments. It is also used as structural timber, for instance in mines and ship building, as well as joinery, and to make plywood, matches, agricultural implements and even artificial limbs. The wood also produces good quality pulp used in the manufacture of cardboard and various grades of paper.

Gmelina arborea leaves as a non-timber forest product is used as wrapping leaves. *Gmelina arborea* leave have a wide range of local medicinal uses. It is used as carminative, in headache, asthma, bronchitis, cholera, colic pain, dropsy, epilepsy, rheumatism, small pox, sore, spleen complaints, syphilis, throat swelling, as antidote to snake bite and some other poisons, cough, gonorrhea. Leaf paste is applied on wounds. A paste of the leaves serve as ingredients of a medicated clarified butter for stiffness of the back and facial paralysis. A paste of leaf is applied to the head for the relief of headache in fever (Khare, 2004, 2007). The leaves are used in dyspepsia, cough and wound treatment. Leaf paste in cephalegia and foul ulcer. Leaf has reported anthelmintic activity and antimicrobial activity (El-Mahmood, 2010).

• **Teak Leaves (*Tectonia grandis*)**

Teak is the common name for the tropical hardwood tree species *Tectona grandis* and its wood products. The species is placed in the family Lamiaceae. *Tectona grandis* is a large, deciduous tree that is dominant in mixed hardwood forests. It has small, fragrant white flowers and papery leaves that are often hairy on the lower surface. It is sometimes known as the "Burmese Teak". Teak timber is particularly valued for its durability and water resistance, and is used for boat building, exterior construction, veneer, furniture, carving, turnings, and other small wood projects (USDA, 2010). *Tectonia grandis* is native to south and Southeast Asia, mainly India, Indonesia, Malaysia, Thailand and Burma, but is naturalized and cultivated in many countries in Africa and the Caribbean.

The teak tree is renowned for its durable wood which can be used for almost any purpose, including in the construction industry, for furniture, flooring, ships' decks, and because it is resistant to the wood-boring mollusc, the shipworm, it is used for piers and jetties too. Virtually every part of the teak tree has medicinal uses, and medical science has shown that the leaves have antibacterial, anti-ulcer and antifungal properties. In other parts of Asia a decoction of the fresh or dried leaves is used for menstrual problems and haemorrhages, as well as a gargle for sore throats. Dyes are produced from the young leaves and this is used for paper products, matting and cloth. The dyes may be yellow-brown or red-brown. This Dye alone is used for dying cloth especially wool and cotton. The leaves are edible and can be used for wrapping kolanut and other food items. Not just a wrapper, teak leaves also has huge benefits for people who want to lose weight.

• **Snails**

The study revealed that the snail meat is a major source of protein in the diet of most people living in the study area. The African giant snail (*Achachatina achatina*), the vineyard snails (*Helix pomatia*) and *Helix lucorum* are unconventional sources of meat (Ariabu *et al*., 2012). Snails are also consumed as a rare delicacy by many Nigerians living outside the forest region. Unlike the conventional meat sources such as beef, mutton and poultry, the snails have very low cholesterol and saturated fatty acid contents (Ariabu *et al*., 2012). The consumption of snails therefore offers nutritional benefits since cholesterol and saturated fatty acids have been implicated in coronary heart diseases and arteriosclerosis (Leisner and Gram, 2000). Because of their feeding habits, snails may act as vectors of some parasitic diseases (Ariabu *et al*., 2012). Therefore, snails require adequate processing in order to assure safety of the meat from public health point of view.

• **Chewing Stick (*Zanthoxylum zanthoxyloides and Massularia acuminata*)**

Many trees in Africa are rich sources of food, building materials and medicines. Some of them give rise to different end products which are used both commercially and in many other ways by local people, for instance in rituals or in terms of medicinal or domestic applications (Sweetmore, 2006). Trade in Non Timber Forest Products (like chewing sticks) provides an opportunity to reduce the pressure on Nigeria's timber resources and consequently reduce further environmental degradation while ensuring that the growing population would have resources to meet its needs (Olawumi, 2013). Chewing stick (a Non Timber Forest Product) trade offers a means of earning comfortable living for many people in Africa (Bosch, 2008). Popular species for commercial purposes are *Garcinia mannii, Rothmannia longiflora* and *Dacrodes edulis* usually chewed for buccal hygiene and treatment of recalcitrant cough (Olawumi, 2013).

There were various plants which were used as chewing sticks in West Africa, the lime tree (*Citrus aurantafolia*) and the orange tree (*Citrus sinensis*) sometimes provided chewing sticks. The roots of the senna (*Cassia vinnea*) were used by American Negroes and those of African Laburnum (*Cassia sieberianba*) were used in Sierra Leone. Neem (*Azadirachta indica*) was widely used to provide chewing sticks in the Indian subcontinent (Adefisoye *et al.*, 2012). Chewing sticks in Nigeria are produced from the root, bark or stem of 24 different tree species (Isawumi, 1978), mostly tree and shrubs with only two climbers. Some of these sources are *Fagara zanthoxyloides* also known as

Zanthoxylum zanthoxyloides, *Massularia acuminata* etc. The most common chewstick in the study area is that of *Massularia acuminata.*

Fagara zanthoxyloides belongs to the family Rutaceae and is known by various local names in Nigeria (Orin ata in Yoruba, Fasakuwa in Hausa, Fasakohiri in Fulani, Ughoghon in Benin, atako in Itsekiri, Ujo in Urhobo and Korokumo in Ijaw). Chewing sticks are obtained by cutting either the stems or the roots into short slim pieces. A tingling peppery taste and numbness is provided by these two plant parts used as chewing sticks (Isawumi, 1978).

The usefulness of chewing sticks in oral hygiene maintenance has been considered comparatively effective as tooth brush (Aderinokun *et al*., 1999). Previous investigations have also demonstrated the antiplaque and antimicrobial action of extracts of some chewing sticks against general oral flora of the mouth (Ndukwe *et al.*, 2005). Chewing sticks therefore can safeguard against dental problems, which is probably the reason why dental caries (decay) is not rampant in certain part of Nigeria where the use of chewing sticks is frequent. The use of chewing sticks has hence been encouraged by the World Health Organization (Wu *et al.*, 2001).

F. zanthoxyloides is known to be useful for various other purposes. It has been reported to possess anti-plasmodial activity (Kassim *et al.*, 2005). Other ailment for which the root-bark extract is used includes: elephantiasis, toothache, sexual impotence, gonorrhoea, malaria, dysmenorrhoea and abdominal pain. In addition, studies have reported the anti-sickling and anticancer activity of extracts of *F. Zanthoxyloides* (Adefisoye *et al.,* 2012).

• Sponge (*Luffa aegyptiaca/Luffa cylindrica*)

Luffa (Luffa cylindrica (L.) syn *Luffa aegyptiaca* Mill) commonly called sponge gourd, bath sponge, is a member of cucurbitaceouse family. In everyday non-technical usage the name, also spelled loofah, usually refers to the fruit of the two species *Luffa aegyptiaca* and Luffa *acutangula*. The fruit of these species is cultivated and eaten as a vegetable. *Luffa cylindrica* has been reported to posses both medicinal and nutritional properties. Its seeds have been used in the treatment of asthma, sinusitis and fever (Sangh *et al*., 2012).

When the fruit is fully ripened it is very fibrous. The fully developed fruit is the source of the loofah scrubbing sponge which is used in bathrooms and kitchens as a sponge tool. The fruit section of *L. aegyptiaca* may be allowed to mature and used as a bath or kitchen sponge after being processed to remove everything but the network of xylem or fibres. The sponge is used like a body scrub.

• Hunting Animals (Grasscutter, Giant rat and Antelope)

Animals have always been part of Yoruba history for several centuries. There were some individuals whose means of livelihood were from hunting in times past. We had big time hunters and secondary hunters. Bushmeat hunting is common in many parts of the world where hunting of animals from the wild is performed. The bushmeat trade refers to the sales of any wild species. Though some bushmeat hunters have been targeting grasscutter, cane rats and other primate species.

Basically, the purposes of hunting are three folds: first, to obtain meat; second, to obtain materials from these animals for local medicines and to make money from the game hunted. In fact, ancient hunters engaged in hunting principally, to obtain meat and to use animal parts to make local medicines. Hunting says Merriam Webster Collegiate Dictionary; a fall-back when confronted with high-risk situation.

Animals have several social, economic, medicinal and religious values, these include: Source of food (meat provision), Economic benefit (trade in-life stock, and games killed for commercial gain), materials for local medicines to manage and to cure illness. Hides and skins of animals killed are used to produce valuable items such as shoes, bags and sheathe.

3.2. Antelope

Antelope is a term referring to many even-toed ungulate species indigenous to various regions in Africa and Eurasia. Antelopes comprise a miscellaneous group within the family Bovidae, encompassing those old world species that are neither cattle, sheep, buffalo, bison, nor goats. The 91 species, most of which are native to Africa, occur in about 30 genera. The classification of tribes or subfamilies within Bovidae is still a matter of debate, with several alternative systems proposed.

Many species of antelope were native to Africa than to any other continent, but some occur in Asia. With some species possessing spectacular leaping and evasive skills, individuals may escape. Texas in particular has many game ranches, as well as habitats and climates that are very hospitable to African and Asian plains antelope species. Antelope live in a wide range of habitats. Numerically, most live in the African savannahs.

3.3. Giant Rat (*Cricetomys gambianus*)

The African giant pouched rat (*Cricetomys gambianus)* is a representative of the family Muridae (Perry *et al.,* 2006), which constitutes a group of the order Rodentia. They are the largest murid species occurring in Africa. It is routinely eaten as bushmeat. It provides supplementary protein diet for rural dwellers. There has been a continuous effort to domesticate it in some parts of Nigeria. The Nigerian Wildlife Conservation Committee has encouraged their domestication efforts through breeding, for the purpose of conservation and supplementation of dietary meat supply (Salami *et al.,* 2011).

In the whole of West Africa, there is a considerable demand for bushmeat because people do prefer it to domestic meat. The bushmeat meat transcends religious prohibitions and Muslims who do not consume rabbit or guinea pig are known to consume bushmeat. Therefore, bushmeat has such wide acceptance.

3.4. Grasscutter *Thryonomys swinderianus* (Greater Cane Rat))

The African grasscutter (*Thryonomys swinderianus*), also known as the greater cane rat and cutting grass, is the second largest rodent after the porcupine. It is found only in Africa (Ajayi *et al.*, 2010) and it is a very good source of high-quality animal protein. Grasscutter farming holds promise for the supply of quality protein to the most poverty-stricken more effectively than raising large livestock on pastures. The grasscutter is a rodent species of high nutritive value generally harvested from the wild, but which has gained recognition as a potential healthy source of animal protein (Okon *et al*., 2008). The market for both fresh and smoked grasscutter meat, as well as its contribution to the per caput consumption of animal protein is unlimited (Ntiamoa-Baidu, 1987).

The meat popularly called "bush meat" is highly acceptable in Nigeria. There is no restriction to its consumption. The meat of grasscutter fetches higher prices than meats of domestic animals (Owen and Dike, 2012). Adeboye (2007) reported that grasscutter is a good source of animal protein of high biological value. Cane-rat meat has good nutritional qualities: high quality animal protein, low fat, high dressing percentage and good/unique taste (Fayenuwo *et al.,* 2003). Like the guinea pig, the meat is of a higher protein but lower fat content than domesticated farm meat and it is also appreciated for its tenderness and taste.

Cane rats are not the most prolific of rodent species, but the high demand, attractive market price, and the small amount of investment required makes cane rats a suitable mini-livestock activity for income generation in many parts of West and Central Africa.

• Non-Biological NTFPs (Sand)

The Non-biological NTFP includes sand, gravel, soils, minerals, stones and water. The study revealed that the non-biological NTFP found within the study area is Sand.

Sand are collected for building purposes, to mix with cement for floors, or making of cement bricks at home, or used in general construction (Shackleton *et al.*, 2007).

3.5. Constraints faced during Collection and Suggested Solutions

Table 2 shows the constraints encountered in collection of NTFPs market as ranked by the respondents according to their importance based on a 3-point Likert Scale and the ten problems identified in this study. The problems are coded as major = 3, mild = 2, no = 1, based on the perceptions of farmers′ on the constraints faced in the collection and marketing of NTFPs.

Table 2 also contains the weighted scores and means of the problems assessed. The Likert scale values were used to calculate the weighted scores and means. These values were ranked and then used to determine the severity of the problems. The measures indicated that high transaction costs was the most severe problem followed by unattractive price, forest laws, credit accessibility, poor road network, inadequate access to physical, infrastructure(such as road, electricity, storage facilities), lack of storage facilities, middlemen, inadequate market infrastructure and lastly climatic factor.

Table 2. Constraints to NTFPs collection in the study area

Constraints	Weighted score	%	Weighted mean	%	Rank order
Poor road network	338	10.25	2.061	10.25	5th
Forest laws	423	12.82	2.579	12.82	3rd
Credit accessibility	357	10.82	2.177	10.82	4th
Inadequate market infrastructure	203	6.15	1.238	6.15	9th
Lack of storage facilities	287	8.70	1.750	8.70	7th
Unattractive price	436	13.22	2.659	13.22	2nd
Climatic factor	178	5.39	1.085	5.39	10th
High transaction cost	485	14.70	2.957	14.70	1st
Inadequate access to physical infrastructure (such as road electricity storage facilities)	306	9.28	1.866	9.28	6th
Middlemen	286	8.67	1.744	8.67	8th
	3299	100	20.116	100	

Source: Field survey, 2013

The respondents' suggestions for mitigating the present constraints in NTFPs collection in the forest reserve include the fact that forest laws should be updated or made current, management of the forest reserve should be looked into to ensure proper management of the reserve, Government should renovate the reserve, conservation laws should be enforced, credits should be made available by the Government and provision of conducive environment for forest agents.

3.6. Other Problems Encountered in Collecting NTFPs

Other problems identified in collecting NTFPs which could be biological, climatic, social and economic in nature include Thick forest limiting their entrance into the forest, the problem of extinction of NTFPs, Hunting accidents (snake bite and gun accident) and disturbance by evil spirits. It was observed that there are some NTFPs that are not available in the study area. These include fruits, charcoal and fuel wood.

4. Conclusions

The neglect of agriculture and forestry in particular has lured so many citizens to unemployment and environmental

consequences such as erosion, pollution, desertification, low productivity in agricultural production and so many other factors leading to our present predicament of insecurity due to economic downturn. Three basic assumptions emerge from NTFP research and literature: NTFPs are good for the environment; they are good for development; and they promote gender equity (Neumann and Hirsch 2000). Based on these assumptions many international development agendas promote NTFPs as tools for sustainable development. That is, NTFPs are viewed as a potential means to better the livelihood strategies of rural populations while simultaneously sustaining the biodiversity of forested areas. NTFPs are important to local livelihoods, in maintaining biological diversity, and sustainable economic growth. NTFPs provide basic subsistence with food, medicines and construction materials for shelter, cultural and ritual values (i.e. incense) as well as cash income for many local communities, especially where these groups have access to forest areas. As a result, marketable NTFPs can provide an important means for economic growth and sustainable forest management in local communities. Basic information regarding NTFPs is necessary for communities to make optimal use of their natural resource. It is therefore important to have knowledge about NTFPs since they can be developed as a means to economic growth and forest resource conservation.

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