

Roles of Non-Timber Forest Products (NTFPs) on Rural Livelihood in Gimi Settlement of Runka Forest Fringe in Katsina State, Nigeria

Salisu Mohammed

Department of Geography, Bayero University Kano, NIGERIA

Abstract: *Despite stiff forest conservation laws in Nigeria which emanated from old colonial laws and forest ordinances of the early 19th century, phenomenal numbers of forest species are gradually lost due mainly to demands of timber products. The emergence of Nigeria as party to several global biodiversity treaties was thought to be effective in curtailing loss of species witnessed in all ecological zones of the country. However, reports of several studies indicate that from the tropical forest zone in south to the very northern Sahel extreme, vegetation of Nigeria is continuously degraded. It is such gloomy events that prompted this study which aim is to assess the role of NTFPs on livelihood of off-reserve community on the fringe of Runka Forest in Katsina, Nigeria. For the study, an estimated population of 4700 persons of Gimi Settlement was obtained and used as population frame. Out of the number a total of 235 individuals were selected using systematic sampling technique. Using the technique, each 20th order consecutive individual of the population was selected as a respondent. A purposive technique was to further select respondents that are 10 years old based on key informants' revelation that only persons of this age (10+) are into full time NTFPs entrepreneurship in the area. Accordingly, 180 respondents were eliminated and only 55 respondents were served with a semi-structured questionnaire. The study found out that because of increase in use of NTFPs to augment peoples' diet, income as well as supply medicinal products in the area, forest species are maintained and less pressured. It is recommended that the knowledge of NTFPs management should be disseminated through schools and mass media to so as to sustain the forest reserve from further encroachment.*

Key words: *Non-timber Forest Product, Livelihoods, Forest Fringe, Katsina State.*

I. Introduction

Forests neighbours, until recent when researches in parts of the World proved otherwise were regarded as exploiters of forests resources because of alleged over tie of livelihoods on products obtained more than any other people. When they are alienated, they tend to use both timber and non-timber forest resources without paying keen services to the resources base (forest) so much so that most bases are now relics of their past. Degradation is one consequence of such actions, in fact more forest species have degraded or gone extinct than are re-conserved after short or long human interference. Humans to forest relationships are inevitable but if done within management limits it tend to be harmonic. Rather than separating resources users (people), Ostrom et al. (2002) have reported that although tragedies have undoubtedly occurred, it is important to recognize that people have self-organized to manage common-pool resources for thousands of years, often devising long-term, sustainable institutions for governing these resources. Moreover, Fairhead and Leach (1996) have noted cases where local agro-ecological practices have improved, rather than degraded, the environment, thus scientist throughout the World have now shift paradigm from non-inclusive to integral approach (Shepherd, 2008) of forest management which project the eking of livelihood options of local resource users to better relieve forests from over use.

Non-timber forest products (NTFPs) have in the past been referred to 'minor' forest products. The terminology was only introduced in 1989 and refers to all tangible plant and animal products (other than industrial timber) that come from tropical and boreal forests and other vegetation systems, and that are used by local people for subsistence and trade (FAO, 1991). This term 'minor' forest product underestimated the importance of NTFPs and hence created a bias impression on the mind of practising foresters on their management (Lintu, 1986). The study of non-timber forest products has been conducted by researchers from various fields such as forestry, ethnobiology, economic botany, natural resource economics, conservation biology, agro-forestry, rural development, ecological anthropology, biogeography and human ecology. This has led to much discussion and no agreement on universally acceptable terminology to describe products of interest according to Wong (2000). NTFPs have been described by FAO (1992) to include all goods as well as services derived from forest or any land under simulation use and this exclude wood in its forms but include plant

materials used for foods, food additive, storage and fodder, cottage and wrapping materials as well as animal, birds, reptiles, fishes for food and leather. NTFPs also include extract such as bark, roots, tuber leaves, fruits, flower seeds, resins and honey and mushroom (Ayeniet *et al.*, 2003).

One principal component of livelihood eking scheme for the rural people and forest communities is the promotion of the use of non-timber forest products. In 1992, delegates to the United Nations Conference on Environment and Development, known as the Rio Earth Summit, identified sustainable forest management as a key element in sustainable economic development. Agenda 21, which emerged from this conference, set out non-binding guidelines for sustainable forest management with specific inclusion of non-timber forest products (Jones *et al.*, 2005). NTFPs have been important to forest fringe communities in Ghana. Non-timber forest products have been recognized internationally as an important element in sustainable forestry. In her study within the high forest zone of Ghana, Falconer (1992) detailed the various support NTFPs make to the livelihood of forest fringe communities. She observed that NTFPs provided a form of a safety cushion to the rural households in times of economic hardship and to support farming. Although some researchers have argued that the capability of NTFPs to alleviate poverty is limited (Boot, 1997; Ros-Tonen and Wiersum, 2003), the importance of NTFPs in the livelihood of forest fringe communities, especially in tropical countries, cannot be underestimated (Parren and de Graaf, 1995).

In recent years attention has been focused on the potential of non-timber forest products in the reduction of poverty and food insecurity, thus improving nutritional and sustainable management of forest resources (Marshall, 2006). Non-timber forest products formed an integral component of the livelihood strategy of rural dwellers in the tropics and continue to be an important fact of household nutrition in Africa (FAO, 1997). This study is aimed at determining the role of Non-timber Forest Products (NTFPs) on livelihoods of Gimi Settlement of the Runka Forest fringe in Katsina State.

II. Study Area

Gimi Settlement is in Safana local government area of Katsina State, Nigeria. It is located some few metres away from the foot of Gimi hill (a landmark of old granite) and adjacent to the Runka forest reserve. The settlement is purely agrarian with most livelihood activities tied to natural resources use as well as farming. Gimi Settlement is located on Latitude $12^{\circ}24'30''\text{N}$ and 12.40°N and on longitude $7^{\circ}24'25''\text{E}$ and 7.40°E .

According to the 2006 population census figures, Safana Local Government has a population of 5,801,586 persons and an average growth rate of 2.8%. Moreover slight difference occurred between male – female ratio where female figure remained higher. Out of the figure, about 49 percent are males while 51 percent are females (NPC, 2006).

The climate of the study area is the 'Aw' type as determined by Koppen in which distinctive wet and dry seasons are caused by the fluctuations of the ITCZ (Inter Tropical Convergence Zone) or the ITD south to north (rainy season), vice versa (dry season). The ITCZ separates humid maritime air mass originating from the Atlantic Ocean and dry desert air mass. The ITCZ follows the apparent movement of the sun, (northwards in April – July and southwards in September – October). Temperature is generally cool in the morning, hot in the afternoon, and very cool in the evening. Maximum temperature range in Katsina is between 29°C and 38°C but harmattan season (November to February) lowers temperature to about 18°C and 27°C in the noon.

With the exception of some exotic species planted as ex-situ conservation trees, the vegetation in the area is composed of indigenous species which grow spontaneously. The trees found include *Parkia biglobosa*, *Adansonia digitata*, *Khayasenegalensis*, *Fadherbia albida*, *Tamarindus indica*, and *Borassus aethiopicum*. Some exotic species include *Azadirachta indica*, *Eucalyptus camaldulensis*. Few fruit trees are grown on farms such as *Magnifera indica* and *Anacardium occidentale*. However *Azadirachta indica* and continuous cover of shrubs is overtaking the once thickly-wooded landscape in the area owing to the role of man in modifying the vegetation cover of the area. Visible signs of deforestation is witnessed on the fringes of the forest some meters away from the settlement such that most valuable species such *Tamarindus indica*, *Khayasenegalensis*, *Balaniteaegyptiaca*, *Gueirasenegalensis*, *Lannea acida*, etc are facing extinction.

III. Methodology

Population

The population of study is estimated to be 4700 individuals in 2012 according to Safana local government population data obtained in 2013.

Sampling Procedure

The study is a survey type where a sample of 55 respondents was selected from the target population using systematic sampling technique. Using the technique, each 20th order consecutive individual of the population was selected and this gave a total of 2305 individuals. A purposive technique was later used to select respondents that are 10+ years old based on key informants' revelation that only individuals of this age are into

independent NTFPs activities in the area. Based on that criterion, about 180 respondents were eliminated because they are not up to 10 years. The respondents consist of 45 males and 10 females, and this has to do with the fact that the area is male dominated culture. Their distribution by age is shown in figure 1;

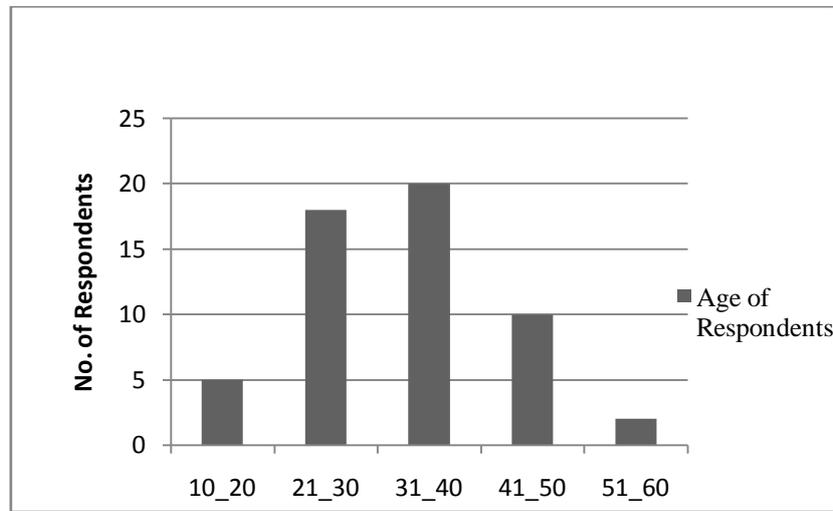


Figure 1: Age of Respondents

Source: Fieldwork (2013)

Data Collection and Analysis

Data collection was conducted using questionnaire that contains 14 semi-structured questions. It was distributed in May 2013 and retrieved 2 weeks later. Only about 53 questionnaires were retrieved because 2 respondents have migrated to city as at time of recollection. Data was mostly qualitative and therefore presented in tables and bar graphs. Percentage was also used to analyse respondents’ views on the role of NTFPs on livelihoods.

IV. Results And Discussion

Non-Timber Forest Products of the Area

The area contains many NTFPs despite the fact that the forest is suffering from degradation and loss of diversity. The relative abundance of these products has to do with enforcement of the forest laws which for long denied the people common access to the forest boundaries.

Table 1: Inventoried Non-timber Forest Products of the Area

Products Category	Types Identified
A. Plants	
EDIBLE	Edible plants and plant parts (seeds, roots, tubers, stems, leaves, shoots, flowers, fruits, nuts), zoranthus, edible fats and oils, spices, flavourings, saps etc
FORAGE	Leaves and Shoots used as feeds to livestock
MEDICINAL	Medicinal herbs, plants, and plant parts (leaves, bark), resins,gums
CONSTRUCTION MATERIALS	Rattan, twigs, small branches, leaves for roofing
	Smallwood for hand tools, kitchen cutleries, leaves for wrapping food, fibers for basketry
AROMATIC	Essential products for cosmetics and incense
B. Animals	
	Meat from mammals, birds, fishes, reptiles and small rodents; eggs
MEDICINAL	Honey, animals parts for medicines

Field work (2014)

Gunnar (1982) thus argued that ‘commercial significance’ should not be the only gauge to measure the relative value of NTFPs and suggested that their ‘importance in respect of the well-being of the people concerned’ would be more applicable. Alternative sources of income such as bee keeping, if provided, would reduce charcoal burning which is greatly reducing the population of *Vitellariaparadoxa* and other trees in the district. NTFPs covers such diverse products as bushmeat (the meat of terrestrial wild animals), nuts, spices, medicinal plants, leaves for wrapping food, fibers, small diameter timber (denoted as ‘smallwood’) for handicrafts and tools, rattan, latex for rubber, ornamental plants, and essential oils. For any particular NTFP, such as fuelwood or weaving materials, several plant species are used. Indeed, communities in the savannas of the northern provinces of South Africa regularly use up to 200–300 plant species (Shackleton et al., 1999).

Uses of NTFPs in the Area

In the past numerous studies have found that it is often the poorest people and households that are most dependent on these resources. NTFPs are now even perceived to be of importance to some local and national economies as well as being important elements in sustainable forestry and for their “contribution to environmental objectives, including the conservation of biological diversity” (FAO, 2003). ITTO (1997) estimated international trade in rattan to worth some US\$ 6.5 billion a year. Estimates of the number of people who are dependent on NTFPs for at least part of their income range from 200 million world-wide to 1 billion in Asia and the Pacific.

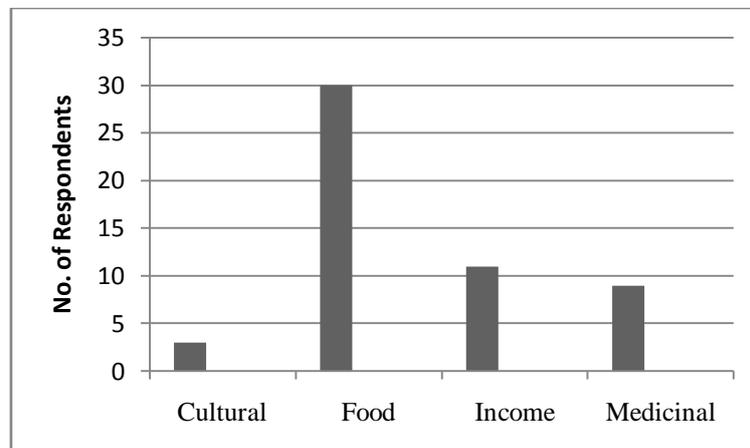


Figure 2: Uses of NTFPs in the Area

Use and valuation of non-timber forest products is a practice that is as old as humankind itself. Statistics on NTFP use and trade are typically scarce. This has to do with the fact that most extraction is for subsistence, and the bulk of trade is unregistered on local markets. Despite this, FAO estimated in 1997 that around 150 species reach international markets, representing a value of US\$11 billion.

According to Pimental et al. (1997) NTFP resources play a major and very often critical role in the livelihoods of a high proportion of the world’s population. UNDP (2001) ascertained that non-timber forest resources (NTFRs) are in daily use throughout the tropics, commonly providing resources crucial to people where no other social security is provided by the State. According to *The Economist* (2000) in a typical African country, only one person in ten has a formal job and economically important species provide a source of informal sector income. In such situations edible wild foods (fruits, wild vegetables, fungi, bushmeat and insects) commonly provide dietary supplements (Cunningham and Davis, 1997).

Non-timber Forest Products and Rural Livelihood in the Area

A total of five rural livelihood sectors are identified to be benefiting from NTFPs in the settlement. Several recent studies on the livelihood strategies of rural people in developing countries have highlighted the significance of livelihood diversification (e.g. Zoomers, 2001). Today, many rural households diversify their livelihoods and combine various strategies to obtain food, consumer goods and income, without focusing on a single activity, crop or even space (Ellis, 1998). People at the forest fringe combine the exploitation of natural resources with farming, off-farm employment and labour migration to cities or even abroad. Thus, most forest people are no longer merely hunters and gatherers and many farmers are no longer exclusively farmers. Within such diversified livelihoods, natural resource exploitation such as the collection of NTFPs still may play an important role (Wiersum and Shackleton, 2003).

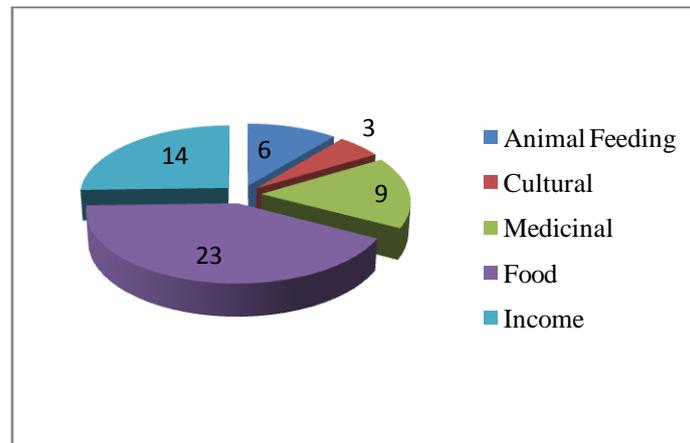


Figure 3: Role of NTFPs on Livelihood of the Area

The use patterns show a remarkable resemblance among livelihood sectors of the area. According to all respondents, people in remote areas use a considerable number of plant species for subsistence, with over 100 hundred different species being no exception. More 60 percent of NTFPs collected in the area are used for food, trade and medicinal purpose this is in consonance with (Ros-Tonen and Wiersum, 2003) that more than 50 percent of these are products are used for medicinal purposes in their study area.

Falconer (1990) buttressed the significance of NTFPs in a study of the so called ‘minor’ forest products and livelihood of rural people across the West African region. Many of these activities are on a small-scale and are not registered. Hence the importance of NTFPs for survival and as a source of income is not fully appreciated by national governments (Mittelman et al., 1997). Employment opportunities based on small-scale NTFP activities are of increasing importance for the rural economy in almost all developing countries (van Rijsoort, 2000). Falconer (1994) also found that three-quarters of the women in Kwampanin, a village in Ghana, were dependent on collecting Maranteceaeleaves as a result of economic collapse caused by repeated forest fires in agricultural areas. This she noted made an important contribution to the regional economy, providing an assured income for a large proportion of the rural and also urban distributors. Using a rough estimate, Falconer (1994) gauged the monthly demand for the leaves in a million bundles, at a value of about £47,000. Apart from income generation NTFPs provide sustenance for rural livelihoods, especially in tropical countries.

Average Income per Households

Although figures on international trade are hard to obtain, a large number of studies and reviews carried out during the past two decades provide insight into how NTFPs are used worldwide. Although incomes derived from the sales of NTFPs are variable both respondents and between trading households, average income was within the same range of estimated as (₦2600—₦4500), but higher for carvers in softwood to about (₦5000).

Table 2: Average Household Income from NTFPs Entrepreneurship in the Area

Types of NTFPs Entrepreneurships	Average Amount (₦)/harvesting Cycle
Carving	above 5000
Honey tapping	up to 3500
Meat supplying (bush meat)	above 3000
Oil processing	less than 4000
Supplying of medicinal products	above 5000
Supplying of vegetables	less than 2000
Trading of ornamentals (cosmetics)	around 1800
Weaving (<i>hyphaenethebaica</i> leaves)	up to 4000

Source: Field work (2014)

On an inventory of NTFPs in a Peruvian rain forest, Peters et al. (1989) illustrated that the net commercial value of NTFPs was higher than timber, considering the fact that NTFPs, unlike timber, can be harvested annually. In the Kolda and Tambacounda regions of Senegal, the sales of NTFPs like harvested fruit, leaves, seeds, gum, roots, bark and honey were worth US\$2 million in 2000. The value added along the supply chain averaged 48% while the value added to game by products reached 63% (Ba et al., 2006).

Challenges Faced by NTFPs Entrepreneurs in the Area

It is evident that there are rising impediments to NTFP entrepreneurship in most parts of the world. However it is necessary to first understand the nature of the challenges at local scale before proffering recommendations. The following is a list of the problems encountered by people working with NTFPs in the settlement as obtained during the field work in 2014.

Table 3: Limitations to NTFPs Entrepreneurship in Gimi Village

Types of Constraints	Products Affected
Periodicity	Most seasonally dependant products
Difficulties with Access Permit	Non-timber products sourced from woody species
Lack of storage facilities	Perishable fruits, seeds, bush meat and other edibles
Lack of properly established markets	All products

Source: Field work (2014)

Trade in NTFPs is often hindered by marketing problems, such as a lack of information on potential markets and marketing channels, the fragmented nature of NTFP markets, the lack of sufficient volume and the unpredictability of the production cycles, resulting in irregular supplies (Panayotou, 1991). Arnold and Ruiz Pérez (1998) further point towards the volatility of many NTFP markets, where prices fluctuate and many NTFPs follow a burst-and-boom cycle which ends up in their substitution by domesticated species or synthetic alternatives (Homma, 1992). The perishable nature of many products, combined with the poor infrastructure and high transport costs in remote areas also hinder the successful marketing of NTFPs. The lack of organisation among harvesters and lack of access to credit and storage facilities (Verheij and Reinders 1998; Van Dijk 1999) impede the extractors' access to markets. In general, extractors of NTFPs prefer other jobs, once alternative employment opportunities become available (Dove, 1993).

V. Conclusion

Various studies have been carried out on non-timber forest products (NTFPs), particularly after the International Tropical Timber organisation (ITTO) called for extensive studies on NTFPs (ITTO, 1988). However, many of these studies have concentrated on socio-economic benefits of NTFPs than biometric aspects. Other studies from ethno-botany and anthropology dwelt on the importance of NTFPs as so called 'minor' forest products and the need for their inclusion in forest management.

In response to escalating concerns about the degradation of federal/state-managed forests, developing countries around the world are increasingly promoting utilisation of non-timber forest products (NTFPs). Among developing countries, Nigeria take the early lead in initiating innovative programs of forest management aimed at involving local communities' use of NTFPs. The first significant step toward adopting communities use of NTFPs was embedded in community forestry approaches as contained in the 1901's colonial forest codes and subsequently in most programs.

This is already a known fact that for any natural resource to be managed sustainably, sound knowledge of the ecology, spatial distribution and abundance of the resource is a must. Such information could be obtained from a number of sources including indigenous or local peoples' knowledge as well as formal scientific enquiry through forest inventories. This has been the ethos of this work because it has unearthed NTFP inventories in off-reserve of Runka Forest. In many studies on NTFPs, researchers contended that off-reserve areas provide the bulk of NTFPs in Nigeria. Arguably, there has been few works done to quantify the abundance and distribution of off-reserve resource. This study was therefore conducted in off-reserve areas of the Runka Forest in Katsina State.

VI. Recommendations

This study recommended that NTFPs venture should be included in youth empowerment program of the state government so as to enhance the livelihood strategies of the people on the brink of forest reserves. The knowledge of environmental resources management should be disseminated to the public through schools, mass media and jingles so as to harness more resources in a sustainable way.

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