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Contribution of Non-Timber Forest Products (NTFPs) to Livelihood of People in Mokwa Local Government Area, Niger State, Nigeria

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ABSTRACT

This study is focused on the contribution of NTFPs species to the livelihood of Mokwa people, Niger state. It was undertaken to ascertain the proportion of humans involved in the exploitation of NTFPs in the study area, to determine the types of NTFPs exploited and their roles in the lives of the communities, and to determine the actual contribution of NTFPs species to the livelihood of the Mokwa people. Data were collected using structured questionnaire and oral interviews to acquire information from sampled members of the Mokwa LGA communities. The data were analyzed using descriptive statistics (tables, chart, and graphs). The findings from this study indicate that NTFPs are abundant in the study area and are found in all the forested land areas within the communities. NTFPs collection for utilization is usually carried out throughout the year. All the respondents in Ja'agi, Kudu, Kpaki, and Mokwa town collect and use the NTFPs in food preparation for the family and for other purposes. The number of households involved in the collection of NTFPs was the highest in the Ja'agi community (95%), while only (28%) households were involved in Mokwa town. The chi-square test revealed that there were high significant differences ($P > 0.05$) between the number of respondents involved in the collection and non-collection of NTFPs in Mokwa LGA. Twenty (20) plant by-products and fruits were the major types of NTFPs being collected. Most NTFPs species were of medicinal plants, while some supplement everyday meals. It should be noted that Mokwa LGA communities earn some money from the collection of NTFPs – especially from the plants, such as *Vitellaria paradoxa* (73%) *Pakia biglobosa* (16%), and *Mangifera indica* (4%). Lack of jobs in the government established institutions is the major problem facing the communities. It is, therefore, recommended that a provision of jobs and business opportunities will help improve the living standard of the people and hence, reduce their effect on the forest resources.

Keywords: Non-Timber Forest Products, Livelihood, Humans, Mokwa

1. INTRODUCTION

Non-timber forest products (NTFPs) are biological resources other than timber, which are extracted from either natural or managed. Examples of plant products include fruits, nuts, oil seeds, latex, resins, gums, medicinal plants, spices, dyes, ornamental plants, and raw materials, such as firewood, bamboo, and rattan (Chassot, 2003; Bhattarai *et al.* 2006). NTFPs are instrumental in conservation, rural livelihoods and poverty reduction (Banjade and Paudel 2008).

NTFPs provide a low-cost survival system providing foods and medicine, so the importance of NTFPs cannot be over-stated (Bhattarai *et al.*, 2006).

NTFPs have a potential to play a vital role in reducing seasonal and long-term malnutrition and food insecurity. Local people have indigenous knowledge on the available forest resources used for their food security in combination with agricultural production. Local people sometimes use these sources for income generation, which provides an opportunity for alternative livelihood option as well. For instance, in the mountainous regions of Nepal, 10-100 per cent of households are reported to be involved in commercial collection of NTFPs and medicinal plants, and in some rural hilly areas, it contributes up to 50 per cent of total annual family incomes (Olsen and Larsen 2003).

Peters *et al.* (1989) reported that in Amazonian rainforest the contribution of NTFPs, such as fruits (US\$300/ha/yr) and latex (US\$16.5/ha/yr) comprised more than 90 per cent of the total (US\$341/ha/ yr) sustainable economic rent available from the forest. Exploitation of NTFPs often involves partial or entire removal of individuals from the population. However, virtually any form of NTFP exploitation in tropical forests has an ecological impact (Browder 1992). The extent to which the Niger State Plantation Forest is able to meet the natural resources need of the Mokwa metropolis people is not known yet.

There is therefore the need to compile synthesis of information on the utilization of NTFPs in the area. Adequate information about the rural communities' interaction with the forest is an important tool for the development of sustainable forest programme, which will enhance the lives of the people. The essence of this study is to provide an in-depth information on the utilization of some NTFPs that can potentially alleviate poverty in the surrounding areas of Mokwa Metropolis.

It will be useful for researchers, educated farmers, as well as entrepreneurs and traders as it will give an insight on the most market-related aspects. The objectives of the study includes to: ascertain the proportion of humans involved in the exploitation of NTFPs in the study area, determine the types of NTFPs exploited and to determine the actual contribution of NTFPs species to the livelihood of Mokwa people.

2. THE STUDY AREA

Mokwa Local Government Area lies within Latitude 7°3' and 9°12'E and Longitude 5°2' and 9°36'E. It shares borders with Moro Local Government Area in Kwara state, Borgu, Lavun, Agale, Kacha and Mashegu Local Government Area of Niger State. The people are predominantly Nupe who are mainly peasant farmers, fishermen and cattle rearers. The population is approximately 244,937.

3. MATERIALS AND METHOD

Data collection techniques

Data were collected using structured questionnaire and oral interviews to acquire information from sampled members of the communities' in Mokwa Local Government Area. Personal interview and direct observation were carried out. 160 structured questionnaires were administered randomly to respondents in 4 selected communities in Mokwa Local Government Area. The selected communities were Mokwa central, Kpaki, Kudu, and Ja'agi. 40 questionnaires were administered in each community and this was used to elicit information on the uses of NTFPs in the study area.

Period and duration of work

A period of three months was used for the data collection. The study was conducted between January and July 2015.

Data analysis

Descriptive statistics was used to analyze the data obtained. The statistics include - tables, charts and percentages.

4. RESULT AND DISCUSSION

The findings from this work revealed that NTFPs is abundant in the study area and are found in all the forest land areas within the communities. Collection for utilization is usually carried out throughout the year. Males and females were involved in the collection of NTFPs, with the number of female (57.5%) being higher than the male (42.5%).

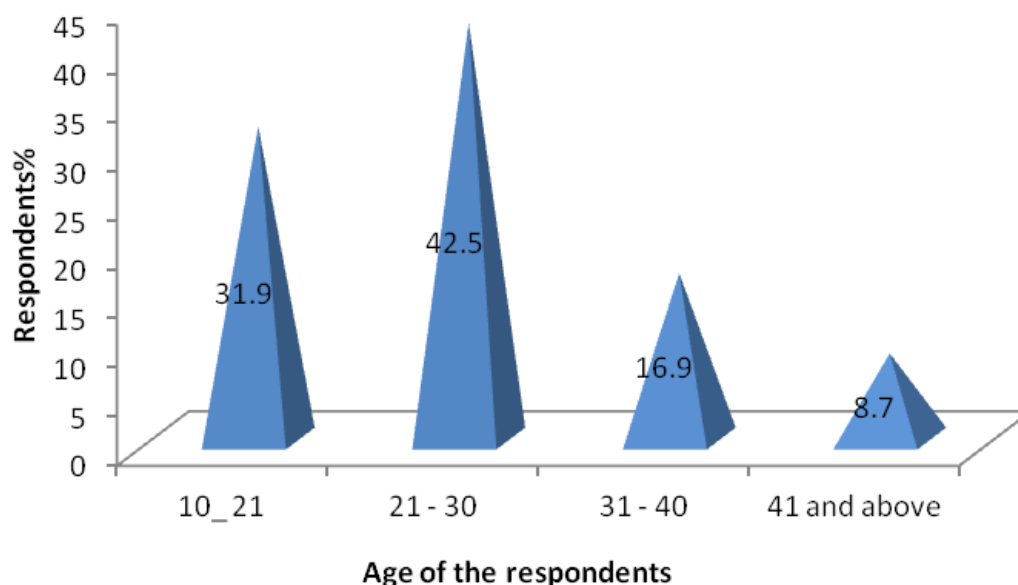


Fig. 1. Age of the respondents (%)

The age of the respondents was classified into three categories. Young 10-20, middle age 21-30, elderly age 41 years and above. Among all respondents, the middle age accounted for higher percentage of representation in both, working and elder age groups having (42.5%). Overall, mean age of all the respondent was 21 – 30 years. The majority of respondents were from the working age group (**Figure 1**).

Education

The education of respondents was categorized into two groups: literate and, illiterate. Majority of the respondents are educated up to tertiary school level with the highest frequency of respondents (87.5%) having obtained certificate in education at National Diploma or National Certificate of Education level.

Only few respondents were found to be illiterate, who did not have the opportunity of going to school, and group includes the elderly people. Ja’agi had the highest percentage of educated respondents (23.75%), while Kpaki with (18.75%) has the least. Similarly Kpaki had the highest percentage of illiterate (6.25%), while Jagi (5%) had the least percentage in both illiterate categories.

Overall, literate and illiterate percentages of all total sampled households were (87.5%) and (12.5%), respectively. The chi-square test showed that there were significant differences between literate and illiterate respondents among the Mokwa town, Kpaki, Kudu and Ja’agi (**Table 1**).

Table 1. Education of respondents, %

Communities	Literate	Illiterate	χ^2	df	P
Mokwa town	36 (22.5%)	4 (2.5%)	8.2286	3	(P > 0.05)
Kpaki	30 (18.75%)	10 (6.25%)			
Kudu	36 (22.5%)	4 (2.5%)			
Ja’agi	38 (23.75%)	2 (1.25%)			
Total	140 (87.5%)	20 (12.5%)			

Source: Field Survey, 2015 (χ^2 = Chi Square; df = degrees of freedom); (N = 160)

Occupation

Respondents’ occupation was categorized into four groups, namely, Farming, trading, employment in government organizations, and students. Faming is the major occupation of the communities, while other activities are considered secondary. From the response, students are the majority (33%) being the highest while those who take farming as the only occupation (17%) are the lowest. Nineteen percentage of the respondents were employed at government services and these fall under the literate members of the communities, followed by trading (31%), **Fig. 2**.

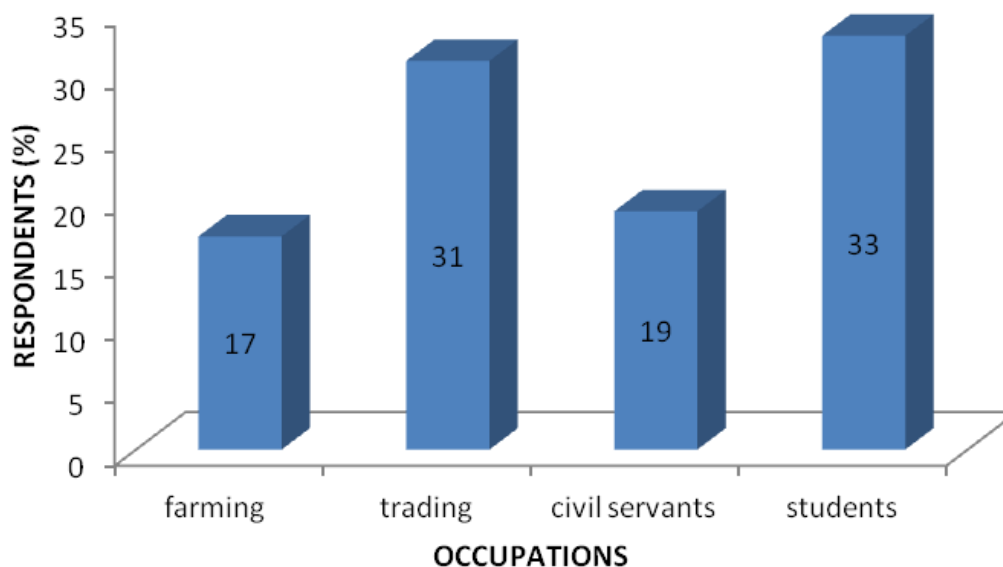


Fig. 2. Occupational of the respondents (%)

NTFPs collection

Table 2 shows the involvement of respondents in NTFPs collection,%. The result shows that the number of households involved in the collection of NTFPs was the highest in the Ja'agi with (95%) households being involved, whereas for Mokwa town only (28%) are involved. The total number of households involved in NTFPs collection in all the four communities was (80%). The chi-square test revealed that there were high significant differences between the number of respondents involved in the collection and not-collection of NTFPs in Mokwa LGA.

Table 2. Involvement of respondents in NTFPs collection %

Communities	Collection	Not collected	Total	χ^2	df	P
Kudu	30 (75%)	10 (25%)	40	8.75	3	(P > 0.05)
Kpaki	32 (80%)	8 (20%)	40			
Mokwa town	28 (70%)	12 (30%)	40			
Ja'agi	38 (95%)	2 (5%)	40			
Total	128 (80%)	32 (20%)	160			

(Source: Field survey, 2015); (χ^2 = chi square; df = degrees of freedom); [N = 160]

Table 3 shows the number of women and household involved in NTFPs collection, The Table shows that the number of women involved in NTFPs collection was higher from the Kpaki community having (60%) than the other three communities, while in Mokwa town the

whole household involvement is higher with (90%) respondents being involved, and the chi-square test revealed that there was a highly significant difference between the number of women and the whole household's involvement in NTFPs collection among all the communities.

Table 3. Women and Household involved in NTFPs collection, %

Communities	Women only	Whole household	Total	χ^2	df	P
Mokwa town	4 (10%)	36 (90%)	40	31.453	3	($P < 0.001$)
Kpaki	24 (60%)	16 (40%)	40			
Kudu	18 (45%)	22 (55%)	40			
Ja'agi	6 (15%)	34 (85%)	40			
Total	52 (32.5%)	108 (67.5%)	160			

(Source: Field survey, 2015); (χ^2 = chi square; df = degrees of freedom); [N = 160]

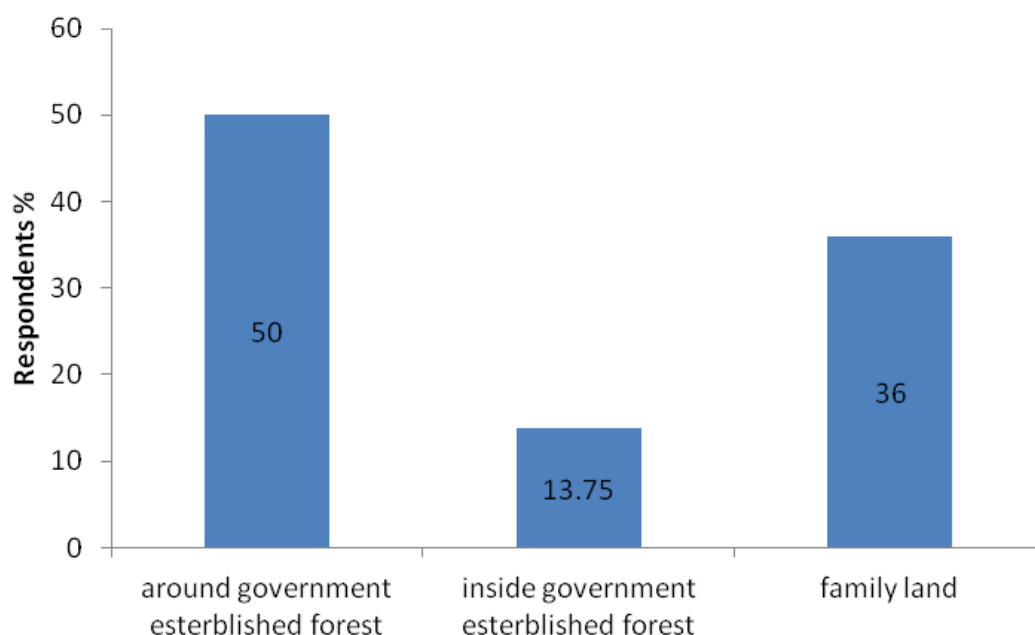


Fig. 3. Places where the NTFPs are collected

Fig. 3 shows the places where the NTFPs are collected, the result shows that the rural people collect the non-timber forest products in the forest surrounding the government established forest reserve having (50%) response being the highest, while (13%) respondents gathered the non timber forest product from the forest within the forest reserve being the lowest. The collection is usually on a part time basis.

Table 4 shows the major types of NTFPs collected and their status in the study area. The result shows that 20 plants by-product and fruits are being collected for direct consumption and for other uses, while many of these plants are still highly abundant in the area.

Table 4. Major types of NTFPs collected and their status in Mokwa LGA.

S/No	Plant: Scientific name	Common name	Consume	Use for other purpose	Availability
1	<i>Detarium macrocarpum</i> Ham (tree)	Tauraa	x	x	Abundant
2	<i>Adansonia digitata</i> Linn	Baobab, kuka, oshe	x	x	Abundant
3	<i>Elies guinesis</i>	Palm tree	x	x	Scarce
4	<i>Annona senegalensis</i>	Wild custard apple, Grandar -daajii,		x	Abundant
5	<i>Phoenix dactylifera</i>	Date palm		x	Scarce
6	<i>Azadirachta indica</i>	Neem tree		x	Abundant
7	<i>Anogeissus leiocarpus</i>	Marike		x	Abundant
8	<i>Mangifera indica</i>	Mango	x	x	Abundant
9	<i>Bombax costatum</i>	Kurya, gurjiya		x	Abundant
10	<i>Piliostigma thonnigii</i>	Kalgo	x	x	Abundant
11	<i>Cochlospermum planchoni</i>	Zunzuna	x	x	Abundant
12	<i>Eucalyptus regnans</i>	Eucalyptus		x	Abundant
13	<i>Afzelia africana</i> Sm	Kawo	x	x	Abundant
14	<i>Grewia mollis</i>	Dargaji		x	Abundant
15	<i>Pakia biglobosa</i> (Jacq.) R.Br.	Doorroowa locust bean	x	x	Abundant
16	<i>Tamarindus indica</i>	Tsamiya	x	x	Abundant
17	<i>Vitellaria paradoxa</i> Gaertn. F	Shea butter tree, Kadanya	x	x	Abundant
18	<i>Tectona grandis</i>	Teak		x	Abundant
19	<i>Gmelina arborea</i>	Gmelina		x	Abundant

20	<i>Bamboo (Poaceae family)</i>	Bamboo		x	Abundant
Total			10	20	

Usages of NTFPs species

NTFP species, such as edible plants and medicinal plants, have been regularly utilized in daily livelihood in Mokwa LGA. Edible plants parts were consumed with daily meals, whereas medicinal plants were used for the primary health care at household whenever necessary and also for trading to make money, Peters *et al.* (1989). The daily meal taken by households are mostly supplemented with wild edible plants parts, such as the tender leaves of the *Adansonia digitata* which are used as vegetable in preparing soup and sauces. These edible plants are being utilized in daily livelihood to mitigate the problem of food deficit, and nutritional demand. Burlingame (2000) asserted wild edible foods are nutritionally superior even to cultivated vegetables. Also in some regions, wild edible foods can be the main source of food (Sundriyal *et al.*, 2003), and medicine (Chassot, 2003; Bhattarai *et al.* 2006). Wild animals, including small antelopes, francolin, rabbit, guinea fowl, tortoise, pigeon, and monitor lizards are also collected and used as for/or sale to generate income for the household.

Table 5 shows a list of NTFP species and their uses in Mokwa LGA. The study found that 20 different NTFPs species have been consumed and utilized in everyday livelihood, as wild edible, medicinal, and other plants. 10 NTFPs species were found to be wild edible plants. Most NTFPs species were medicinal plants, and most plants act as supplements in everyday meal as the vegetables and curries. The study reveals that NTFPs are consumed throughout the year as per seasonal availability.

Table 5. List of NTFPs species and their uses in Mokwa LGA.

S /No	Scientific name	Common name	Uses
1	<i>Detarium macrocarpum</i> <i>Ham (tree)</i>	Tauraa	The ripe fruits are eaten by man The leaves are cooked and use as steam bath against fever
2	<i>Adansonia digitata</i> Linn	Baobab, kuka, oshe	Young leaves are use as vegetable in preparing soup and sauces. Young leaves are dried very well, then ground and added to hot pap, drunk to cure diabetics, cough and asthma. Ash from the burnt wood is use as fertilizer and in making soap. Fruits are eaten by goat.
3	<i>Elies guinesis</i>	Palm tree	Oil is use in cooking and frying food stuffs, Palm front use in making broom, root burnt and use in making soap.

4	<i>Annona senegalensis</i>	Wild custard apple, Grandar - daajii,	Root or Leaves are boiled, then drunk to cure diarrhea, and venereal diseases The mature fruit is edible, and is eaten by primates and human
5	<i>Phoenix dactylifera</i>	Date palm	Palm front use in making local hart and hand fan
6	<i>Azadirachta indica</i>	Neem tree	Leaves, stem, bark use to treat malaria
7	<i>Anogeissus leiocarpus</i>	Marike	Leaves are boiled, cool and drink to cure or prevent malaria. The plant is use as chew-stick
8	<i>Mangifera indica</i>		Plant is use in constructing house. The mature fruit is edible, and is eaten by man
9	<i>Bombax costatum</i>	Kurya, gurjiya	The wood is use for making articles-chairs Fruit contains white floss use for stuffing mattress, Barks boil and drink to prevent and cure pile
10	<i>Piliostigma thonningii</i>	Kalgo	Young leaves chew and the fluid use to treat fresh cut/wound
11	<i>Cochlospermum planchoni</i>	Zunzuna	Root soaks in water and drunk to cure yellow fever/malaria Roots pounded sieved and use to colour soup, The plant is also use to make rope
12	<i>Eucalyptus regnans</i>	Eucalyptus	Use as pole, building, firewood,
13	<i>Afzelia africana Sm</i>	Kawo	Leaves use to feed cattle; Seeds are ground and used in thickening soup by man
14	<i>Grewia mollis</i>	Dargaji	The ripe fruits are edible
15	<i>Pakia biglobosa (jacq.) R.Br.</i>	Doorroowa locust bean	The fruit is prepared as spices for seasoning food; The root is cooked with little potash and drunk to cure stomach ache
16	<i>Tamarindus indica</i>	Tsamiya	Fruits are soak in water and drink to prevent malaria and cure body pains
17	<i>Vitellaria paradoxa Gaertn.F</i>	Shea butter tree, Kadanya	Oil is used in cooking and fraying, Root and Bark are soaked in water, drink daily to treat west paid and venereal diseases. The fruits are edible
18	<i>Tectona grandis</i>	Teak	Use as pole, firewood, leaves use in rapping food stuffs
19	<i>Gmelina arborea</i>	Gmelina	Use: building, firewood, leaves use in rapping food stuffs
20	<i>Bamboo (Poaceae family)</i>	Bamboo	Use in construction of building, furniture, canes, fishing rods

Table 6 shows the rate of NTFPs consumed and used for other purpose (%), in Ja'agi (80%) respondents use NTFPs for other purpose, while only (20%) is consumed NTFPs directly. The chi-square test shows that there is no significant difference between NTFPs consumed directly as food, and those utilized for purposes other than food in all the communities.

Table 6. NTFPs Consumed and use for other purpose, %

Communities	Consumed	Use for other purpose	Total	χ^2	df	P
Kudu	15 (37.5%)	25 (62.5%)	40	3.3082	3	(P>0.05)
Kpaki	10 (25%)	30 (75%)	40			
Mokwa central	12 (30%)	28 (70%)	40			
Ja'agi	8 (20%)	32 (80%)	40			
Total	45 (28%)	115 (72%)	160			

(Source: Field survey, 2015); (χ^2 = chi square; df = degrees of freedom); [N = 160]

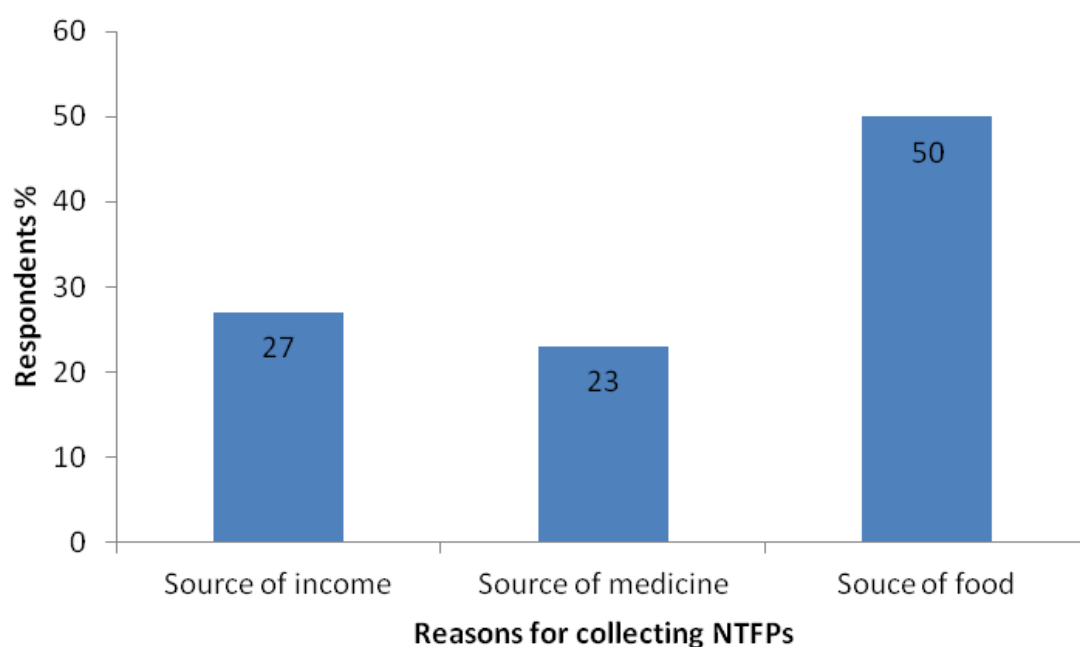


Fig. 4. The reasons for collecting NTFPs (%)

Fig. 4 shows the reasons for collecting NTFPs (%). The finding indicates that majority of the respondents collect NTFPs for food purposes (50%) being the highest, while (23%) collect

it for medicinal purpose. This indicates that high demands are being placed on NTFPs in the forest/ woodlands around. This agrees with Bhattarai *et al.* (2006) report that the Non- Timber Forest Products (NTFPs) are one of the important natural resources of which the majority of the rural people depends on them as a source of food, fodder, fiber, medicine, condiment, dye, and other useful materials.

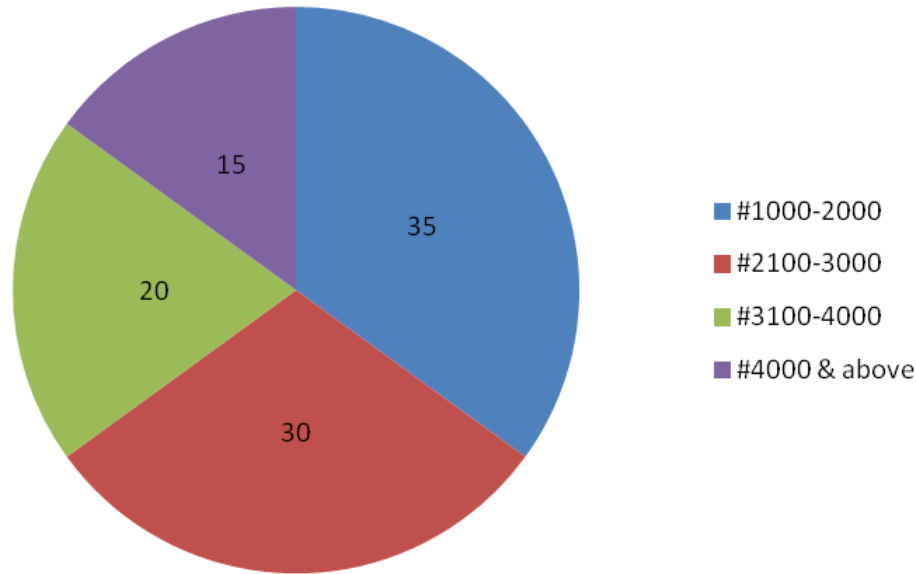


Fig. 5. Income generated from the sale of NTFPs per month (%)

Fig. 5 shows the income generated from the sale of NTFPs in the study area. The study found that Mokwa LGA communities earned some money from the collection of NTFPs, such as *Pakia biglobosa*, *Mangifera indica* and *Vitellaria paradoxa*. Average income of ₦ 1000-2000 naira per month was realized at the household level in the area, this being enough to solve household needs for the day. This agrees with Olsen and Larsen (2003) report that in some rural hilly areas of Nepal, NTFPs contributes up to 50 per cent of total annual family incomes. However, the number of households involved in the collection of NTFPs was high in Mokwa LGA communities but not all the NTFPs collected are being sold. The rural communities are highly dependent on a range of NTFPs for their subsistence needs which contribute a lot to their total annual family income (Olsen and Larsen 2003). The NTFPs therefore generate little income to the people, but continuing utilization will reduce the forest and land resources in the area. For the reasons behind the depletion of NTFPs species were both, over-collection and premature harvesting. As a result of food deficiency, people are under pressure to make money from NTFPs collection. There is also a competition among primary collectors to collect more NTFPs. In addition, traders sometimes encourage the primary collectors to collect more quantities, particularly of those species with a higher market demand, hence, the availability of NTFPs species have been depleting day-by-day. There is a need to educate rural communities on the sustainable collection of economically valuable NTFPs species, because there is an opportunity of income and employment generation through cultivation of economically valuable NTFPs species.

The major problems and solutions suggested by the respondents indicate that lack of job, lack of health facilities, and poverty are the major problems the communities are facing. Therefore, provision of jobs and business opportunities will help improving the living standard of the people and hence reducing their activities on the forest resources.

5. CONCLUSIONS

To supplement the low agricultural production in the rural areas of Niger state, the citizens of Mokwa have been given due consideration to NTFPs as an effective means to enhance the economic benefits to rural people and to help in improving livelihood, household, food security and nutrition. The study revealed that the utilization of the NTFPs by the communities helped to bring development to the communities. It was also recorded that the utilization helped to promote the image of the communities, as it was noticed that companies as well as individuals from nearby towns and cities come to purchase these NTFPs from these communities, especially shea butter oil. The study also showed that the utilization of these NTFPs also boosts the use of herbal medication among humans both, in the local communities and urban areas. Therefore, awareness campaigns on the conservation of habitats of NTFPs species, both, edible, medicinal plants, and tradable NTFPs species, should be conducted at the village level. At the same time, a local regulatory system should be launched which will regulate the harvesting of NTFPs species from government forests and other lands. This could also lessen the dependence of household on consumption of NTFPs; thereby help to preserve it for the future purposes.

Recommendations

The following recommendations are made based on the findings:

- Better job and business opportunities should be provided by the government, as well as even private owners, to help boost the economy of these communities
- Well equipped hospitals should be established in these communities for a better medical treatment of the members of these communities, thereby reducing the over- exploitation of these NTFPs.

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