

Effects of Non-Timber Forest Products (NTFPs) Exploitation on Rural Development in Osun-State

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Abstract

The importance of potentials of forest products in rural development and the economy of the nation has not been fully harnessed. This study therefore assessed effects of Non-Timber Forest Products (NTFPs) exploitation on rural development in Osun-State. Multistage sampling technique was used to select 156 rural households in the study area. Data were collected using interview schedule. Descriptive statistical tools such as frequency counts, percentages were used. The study revealed the mean age of the respondents to be 54 years, with a standard deviation of 11.95. 57.7% of respondents were male, while 42.3% were female. All (100.0) of each of the respondents indicated that kola nut and bitter kola were the exploited non-timber forest products. Around 98.1%, 94.9%, and 74.4% of the respondents signified that walnuts, All (100.0%) of each of the respondents signified that ginger and turmeric were the exploited non-timber forest products. Around 98.7% of the respondents indicated Tabasco pepper, black pepper (98.1%), and 88.5% each indicated that Solanum nigrum and Senecio biafraewere the exploited non-timber forest products. Nevertheless, balsam (85.9%), garlic (84.0), thorny pigweed (69.9%), and Lactuca taraxacifolia (62.8%) were identified as exploited non-timber products by the respondents. The exploitation of non-timber forest products has improved the immunity of the respondents against diseases due to frequent herbal drugs used and Exploitation of non-timber forest products reduces crop production rate were ranked 1st and 2nd with a weighted mean score of 4.9 and 4.8 respectively while non-timber forest products contribute to job availability was ranked 3rd with WMS of 4.7. It was concluded that exploitation of non-timber forest products has improved the immunity of my respondents against diseases due to frequent herbal drugs used was the most prominent among the effects of Non Timber Forest Products (NTFPs) exploitation on rural development. Therefore, government should provide soft loans to the herbal drugs producers: in other to promote their production.

Keywords: Effects, Exploitation, Forest Products, Immunity, Non-timber

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1. INTRODUCTION

Non-Timber Forest Product helps in accelerating agricultural and economic advancement and in the developing countries, Non-Timber forest products keep on performing an essential role in rural community development. Rural development is a strategy or approach for improvement that is directed towards a specific field of social facilities required in improving the condition of living, social, economic or cultural. Its effect in the field of social development is socially conditioned, since it brings about awareness and the improvement of relationships between individuals, groups, communities and organizations to ensure a sustained development (Marcus, 2015).

Hodge and Midmore (2008) in their study on the roles of forest resources in rural development, found out that rural households spend income realized from non-timber forest products to buy food to maintain their families, buy household facilities and also build their residential houses. Forest products can be used to aid community development projects like road maintenance, hospitals, recreation center, electricity, boreholes among others (Iheke and Eziuche, 2016). Success of rural development from forest resources use was recorded in the Communal Area Management Plan for Indigenous Resources (CAMPFIRE) projects, CANARI and the ECOGEN projects in Zimbabwe, the Caribbean and Kenya respectively. Zimbabwe's CAMPFIRE programme Before Zimbabwe went into political and economic instability, the community-based approach known as the communal area management programme for indigenous resources (CAMPFIRE) launched in 1986 proved to have positive results on biodiversity conservation.

The rate of development experienced in the rural area cannot be felt equally among the rural people as they possess various socio-economic characteristics that might influence the rate of development experienced. Natural resources especially forest products play a significant role in rural development and the economy of the nation. Over 75% of the country's population lives in rural areas (Ansbert, 2008). The majority of these people living around the forest depend on the environment and Non-Timber forest products for their livelihoods. The link between livelihoods and exploitation of forest products is of fundamental importance to national prospects for economic growth and development of rural area. The need to study such linkages cannot be over-emphasized. Due to the scope of coverage of this study, it is believed that non-timber forest products that abound in different areas are distinct and this is expected to have an influence on the rate of development. Therefore, it is pertinent that Non-Timber forest products that abound in this study areas should be known and the exploited forest products by the respondents should be taken into cognizance in order to give rooms for rural development.

The specific objectives are to:

1. Describe the socio-economic characteristics of the respondents in the study areas;
2. Identify the NTFPs exploited
3. Identify the effects of NTFPs exploitation on rural development

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2. RESEARCH METHODOLOGY

The study was carried out in Osun State. Osun state is Located in south-western Nigeria, and lies within latitude 7.0° and 9.0° N, and longitude 2.8° and 6.8° E. The state covers a total land area of approximately 8,602 km² and lies between 300 and 600m above the sea level with a largely gentle and undulating landscape. The average rainfall ranges from 1125 mm in derived savannah to 1475 mm in the rain forest belt. The mean annual temperature ranges from 27.2°C in the month of June to 39.0°C in December. The soil types are varied but most contain a high proportion of clay and sand, and are mainly dominated by laterite (Sofoluwe, Tijani and Baruwa, 2011). Osun State has thirty 30 Local Government Areas which are divided into three Agricultural Development Programme Zones; namely Ife Ijesha, Osogbo and Iwo. The area is mainly agrarian. They also engage in other activities such as trading in agriculture produce, artisan activities (blacksmith, knitting, mat and bag weaving, household utensils etc.), sales of household labour, processing of agricultural produce such as garri.

The target population of the study comprised inhabitants of communities that are into exploitation of forest products in the study area. The inhabitants were men and women who engaged in the collection of forest products.

Multistage sampling procedure was used for the study. In Osun State, there are three (3) agricultural zones namely, Ife/Ijesha, Iwo and Osogbo with extension blocks of 11, 7 and 12. This makes a total of six (3) agricultural zones and thirty (30) extension blocks in the study area. In lieu of this, seventy percent (70%) of the agricultural zones were randomly selected and purposively selected two (2) agricultural zones (Ife/Ijesha and Iwo) in the first stage. The second stage involved the random selection of three (3) extension blocks from each of the selected agricultural zones. Oriade, Obokun and Ife South extension blocks were selected from Ife/Ijesha agricultural zone while Irewole, Iwo and Ola-Oluwa extension blocks were selected from Iwo Agricultural zone. This makes a total of six (6) extension blocks that were used for this research work. The third stage involved the random selection of two (2) extension cells from each of the randomly selected extension blocks. Eti-Oni and Ikeji-Arakeji were selected from Oriade extension block; Aba Owode and Ilahun from Obokun extension block; Aba –Ijesha and Idi-Obi from Ife South extension blocks; Wasinmi and Ayetoro from Irewole extension blocks; Idi- Iroko and Oloba from Iwo extension block while Asa-Ajagunlase and Asamu/Ilemowu were selected from Ola-Oluwa extension blocks. This will make a total of twelve (12) extension cells that were selected for this research work. Fourth stage involved random selection of 50% of respondents in each of the selected extension cells across the extension blocks. The sample size was one hundred and fifty-six (156) respondents.

Descriptive Statistical Tools that were used include frequency counts, percentages and means. These were used to describe socio-economic characteristics of the respondents and all other objectives of the research work.

3. RESULT AND DISCUSSION

Table 1 illustrates the socio-economic characteristics of the respondents. 32.7%, fell within the age range of 41-50 years, while approximately 27.6% were aged between 51-60 years. The percentage decreased notably in the age bracket of 61-70 years, with only 17.3% falling within this range. Additionally, 13.5% of respondents were under 40 years old, and 9.0% were over 70 years old. The mean age for respondents was 54 years, with a standard deviation of 11.95. This indicates that the majority of respondents were in their middle ages, likely due to the responsibilities they bear, leading them to engage in the exploitation of non-timber products in the study area.

57.7% of respondents were male, while 42.3% were female. This near-balanced ratio suggests no significant difference in the sex of respondents engaging in the exploitation of non-timber forest products in the study area.

A significant majority (79.5%) of respondents reported being married, indicating a prevalent marital status among the sample. Additionally, approximately 6.4% of respondents identified as single, or widowed, while 5.1% indicated being estranged from their partners and 2.6% as divorced. This data suggests that the majority of respondents in Osun State carry responsibilities associated with marriage, which may influence their engagement in non-timber forest product exploitation.

Revealed that more than half (53.5%) of respondents reported having 6-9 members in their households, with approximately 44.9% having between 2-5 members, and only 1.3% having more than 9 members. The mean household size was approximately 6 members, indicating an average family size among respondents.

Overall, the data underscores the importance of considering household demographics in understanding resource utilization patterns and highlights the need for tailored interventions to promote sustainable resource management practices in the study area

Table 1 Socio-economic characteristics of the respondentss

Socioeconomic Characteristics	Frequency	Percentage
Age (Years)		
< 40	21	13.50
41-50	51	32.70
51-60	43	27.60
61-70	27	17.20
> 70	14	9.00
Mean = 54		
Sex		
Male	90	57.70
Female	66	42.30
Marital Status		
Married	124	79.50
Single	10	6.40
Widowed	10	6.40
Estranged	8	5.10
Divorced	4	2.60
Household size (Number)		
2 - 5	70	44.90
6 – 9	83	53.50
> 9	3	1.60
Mean = 6		

Source: Field Survey, 2023.

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Non Timber Forest Products (NTFPs) exploited

Table 2 shows the distribution of respondents by exploited non-timber forest products (NTFP) in Osun state. All (100.0) of each of the respondents indicated that kola nut and bitter kola were the exploited non-timber forest products. Around 98.1%, 94.9%, and 74.4% of the respondents signified that walnuts, *Irvingia gabonenses*, and African star apples were the exploited non-timber forest products while 69.2% of them indicated that Bush mangoes were the exploited non-timber forest products. However, 34.5% and 6.4% of the respondents claimed that garden eggs and Bush mangoes were the exploited non-timber forest products in the study area. This indicated of this result is that both kola nut and bitter kola are very important economically to the rural dweller because of their wide range of acceptance in the cash crop market, aphrodisiac nature, and fashion industry where they are used in the production of textiles. Also, the acceptance of the kola nut and bitter kola amongst the different ethnic groups in Nigeria as they have become part of their culture in ceremonies such as the naming ceremony of newly born babies, birth naming, funeral, and graduation ceremonies. In contrast, Bush mangoes a quietly going into extinction and are not as common as they used to be and this could be the reason it garnered a low proportion compared to other forest fruits.

Considering vegetables as one of the exploited non-timber forest products, all (100.0%) of each of the respondents signified that ginger and turmeric were the exploited non-timber forest products. Around 98.7% of the respondents indicated Tabasco pepper, black pepper (98.1%), and 88.5% each indicated that *Solanum nigrum* and *Senecio bialfraewere* the exploited non-timber forest products. Nevertheless, balsam (85.9%), garlic (84.0), thorny pigweed (69.9%), and *Lactuca taraxacifolia* (62.8%) were identified as exploited non-timber products by the respondents. However, 34.6% of the respondents pointed out that Efomarugbojiyan had the lowest proportion of exploited vegetables in the study area. This result implies that the importance of ginger and garlic in the African diet is very important. Also, the two vegetables are believed to support healthy living which is cherished by the rural dweller. In recent times, these two and other vegetables have become part of everyday food for their colour and aroma in foods and this could increase the exploitation among the respondents. Efo marugbojiyan possibly is the least popular among the inhabitants and as such, it low proportion among the other vegetables in the study area.

Medicinal plants have played a very important role in the life of both the rural and urban populace of the world and this has in turn affected the exploitation of these non-time forest products. The majority (92.9%) of the respondents indicated neem seed, and basil (85.9%) while 64.1% of each of the respondents signified that kananfuru, ibo, epoir, ewe iyere and ewe ailu were the exploited non-time forest products. In addition, ewe eju (62.2%), hibiscus (59.0%), and 55.8% of each of *Nicotiana tabacum* and ewe ejinrin were signified by the respondents as exploited NTFPs. However, a low proportion was observed with the following exploited medicinal plants; brimstone tree (48.7%), Negro pepper (43.6%), neem leaf (38.5%), neem tree back (35.9%) and mushroom (31.4%). The low patronage of the exploited medicinal plants could be due to some

factors such as the age of the respondents, sex, and religious background as it was seen that the Abrahamic religions had the largest population of the respondents and they are known to regulate the use of medicinal plants. It was seen from the log that the majority of the respondents identified the neem seed as an exploited medicinal plant and this could be a result of the recent research into its efficacy in the production of insecticide and usefulness in the production of herbal mixtures for the treatment of ailments among the respondents.

Feeding small ruminants in the rural area is important to an average household in the rural areas. Around 45.4% of the respondents signified fodder and forages while 41.0% of them indicated were one of the exploited non-timber forest products. The result implies that fodders and forages may not be popular amongst the respondents as other locally made fodders such as the peel of cassava and household leftovers could be more appealing to the locally reared small ruminant animals. Also, honey may not be a staple food or of economic importance among the respondents, thereby leading to a low level of exploitation.

The distribution of bush meat as an exploited NTFP, 100% indicated giant rats, grasscutters (98.7%), antelope (92.3%), and snakes (77.6%). Around 48.7% of the respondents signified bush pig, quail birds (44.9%), and 35.9% of each of the respondents signalled guinea fowl and porcupine while 5.8% of the maintained that monitor lizards were among the exploited NTFPs in the study area. All (100.0) of the respondents indicated Leaves in the form of spices and condiments as a form of exploited NTFP. Also, the majority (100.0) of the respondents indicated palm oil, 96.7% specified palm wine, coconut chaff (91.8%), palm nut (75.0%), and coconut fruit (52.2%). However, palm leaves and palm tree logs had 48.9% and 40.8% of the exploited NTFP respectively. The snail had 52.2% of the proportion of exploited non-timber forest products as indicated by the respondents in the study area. This implies that palm oil is still one of the most sought-after oils in the study area. With the high demand in the cooking oil industries, the bleaching of palm oil to give clean and clear vegetable oil has increased its level of usage. This result implies that all the fruits with the highest proportions had economic importance in the study area with their on-seasons blessed with an abundance of non-timber forest products.

Table 2: Exploited non-timber forest products

Forest product (non-timber)	Exploited forest product (non-timber)	
	Frequency*	Percentage
Fruits		
Kola nuts	156	100
Bitter kola	156	100
Walnut	153	98.1
Garden egg	56	35.9
Bush mangoes	108	69.2
<i>Chrysophyllum albidum</i> (Agbalumo)	116	74.4
<i>Irvingia gabonensis</i> (Oro)	148	94.9
Bush mangoes	10	6.4
Vegetables		
Ginger (ataile)	156	100.0
Tumeric (ataile pupa)	156	100.0
Black pepper (ataiyere)	153	98.1
Thorny pig weed (tetelegun)	109	69.9
Balsam (Ejorin)	134	85.9
Tabasco pepper (ata)	154	98.7
Garlic (Ayu)	131	84.0
<i>Lactuca taraxacifolia</i> (Yanrin)	98	62.8
<i>Struthium sparaganophora</i> (Ewuroodo)	132	84.6
<i>Solanum nigrum</i> (Efoodu)	138	88.5
<i>Senecio bialfrae</i> (Efoworowoo)	138	88.5
Efomarugbojiyan (HERBS)	54	34.6
Medicinal plants		
Neem tree bark (Epoigi)	56	35.9
Neem leaf (Ewe dongoyaro)	60	38.5
Neem seed	145	92.9
Basil (Efirin)	134	85.9
Brimstone tree (Oruwo)	76	48.7
Hibiscus (Ewe zobo)	92	59.0
<i>Nicotiana tabacum</i> (Ewe taba)	87	55.8
Negro pepper (Eeru)	68	43.6
Konanfuru	100	64.1
Ibo	100	64.1
Epoira	100	64.1
Ewe iyere	100	64.1
Ewe ailu	100	64.1
Ewe eju	97	62.2
Ewe ejinrin	87	55.8
Mushroom (olu)	49	31.4
Fodder and forages	77	45.4

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Honey	64	41.0
Bush meat		
Giant rat (Oliefe)	156	100.0
Bush pig (<i>Eleda igbho</i>)	76	48.7
Antelope (Igala)	144	92.3
Grasscutter (Oya)	154	98.7
Snakes (Ejo)	121	77.6
Quail (Eye aparo)	70	44.9
Guinea fowl (Awo)	56	35.9
Porcupine (Oore)	56	35.9
Monitor lizard (Anta a/Aleegba)	9	5.8
Leaf (spices and condiment)	156	100.0
Coconut/palm tree		
	102	65.4
Palm wine		
Palm oil	156	100.0
Palm nut	116	74.4
Palm leaves	60	38.5
Palm tree log	51	32.7
Coconut fruit	97	42.9
Coconut fruit chaff	143	91.7
Snail	66	42.3

Source: Field survey, 2023 *Multiple response

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Table 3 reveals the effects of non-timber forest products exploitation. The ranking is as followed using the WMS: The exploitation of non-timber forest products has improved the immunity of the respondents against diseases due to frequent herbal drugs used and Exploitation of non-timber forest products reduces crop production rate were ranked 1st and 2nd with a weighted mean score of 4.9 and 4.8 respectively while non-timber forest products contribute to job availability was ranked 3rd with WMS of 4.7. This finding suggests that the exploitation of non-timber forest products in Osun State has preserved indigenous knowledge about how to use some non-timber forest products and enhanced respondents' immunity against illnesses as a result of their frequent use of herbal products as drugs. Moreover, exploitation of non-timber forest products has improved procurement of food items in the house (WMS = 4.5), non-timber forest products exploitation has increased my income, exploitation of non-timber forest products has provided packaging materials for the respondents and exploitation of specific forest species (herbal plants) has reduced my belief in the potency of orthodox medicine with all having WMS of 4.4 each and ranked 5th. In addition, exploitation of non-timber forest products facilitates easy payment of children school fees and exploitation of non-timber forest products has encouraged the use of

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traditional medicine in the respondents both had WMS of 4.3; exploitation of non-timber forest products aids quick regeneration of indigenous/wild plant species, wild fruits and vegetables are always available for consumption in the respondents due to exploitation of non-timber forest products, exploitation of non-timber forest products aid diversification of respondents economic activities, exploitation of non-timber forest products has provided another source of livelihood apart of crop production and access to acquire more material possession from money accrued from non-timber forest products were all ranked 10th with each having a weighted mean score of 4.2. The exploitation of non-timber forest products has increased saving capabilities especially during the raining periods (WMS = 4.1), exploitation of non-timber forest products has enabled me to meet family social responsibilities (WMS = 3.9), exploitation of non-timber forest products has strengthened my belief in cultural and traditional belief (WMS = 3.5) and exploitation of non-timber forest products has improved expenditure on festivals/ceremonies with a weighted mean score of 3.2 were all ranked in that order as the effect of non-timber forest products exploitation on the respondents in the study area. Moreso, one cannot run at a loss when engaged with sales of non-timber forest products and forest resource exploitation contributed to popularity within the community each had a weighted mean score of 3.1; harvesting and exploitation of non-timber forest products increase individuals to high risk/dangers (WMS = 3.0) and money is not spent on consumption of fresh fruits with WMS of 2.6 were ranked 19th, 21st and 22nd.

From the result obtained, exploitation of non-timber forest products can expose the land to erosion and exploitation of non-timber forest products has decreased the respondents' expenditure on non-food items each had a weighted means score of 2.5 while exploitation of non-timber forest products has improved domestication of forest animals, had a weighted mean score of 2.4 and were ranked 23rd and 25th respectively. Lastly, exploitation of non-timber forest products can expose the land to erosion was ranked least (26th) with a weighted mean score of 2.2. This result is an indication that the presence of non-timber forest products in the study area does not negatively affect crop farming. This affirms the position that most of the respondents used non-timber forest products to augment their income and as secondary occupation as crop farming is seen as the major occupation of the respondents. The results also indicate that the exploitation of non-timber forest products can contribute to erosion, decrease expenditure on non-food items, and improve the domestication of forest animals. Notably, the presence of non-timber forest products does not negatively affect crop farming; instead, it augments the income of respondents and acts as a coping strategy during the off-season for farming and for climate change and variability.

Table 3: Distribution of respondents according to Effect of non-timber forest products exploitation on respondents

Effects of non-timber forest products exploitation	WMS	Rank
ENVIRONMENTAL EFFECTS		
Exploitation of non-timber forest products can expose the land to erosion	2.5	23 rd
Exploitation of non-timber forest products increases individuals to high risk/dangers	3.0	21 st
Exploitation of non-timber forest products can expose the land to erosion	2.2	26 th
Exploitation of non-timber forest products increases individuals to high risk/dangers	4.2	10 th
Exploitation of non-timber forest products reduces crop production rate	4.8	2 nd
ECONOMIC EFFECTS		
Exploitation of non-timber forest products has improved procurement of food items in the house	4.5	4 th
Exploitation of non-timber forest products has increased saving capabilities especially during raining period	4.1	15 th
Exploitation of non-timber forest products has decreased the respondents' expenditure on non-food items	2.5	23 rd
Exploitation of non-timber forest products has improved domestication of forest animals such as grass cutter, snails, quails etc.	2.4	25 th
Exploitation of non-timber forest products facilitates easy payment of children school fees	4.3	8 th
Wild fruits and vegetables are always available for consumption in the rural area.	4.2	10 th
Exploitation of non-timber forest products aid in diversification of respondent's economic activities	4.2	10 th
Non-timber forest products exploitation has increased my income	4.4	5 th
Exploitation of non-timber forest products has provided another source of livelihood apart from crop production	4.2	10 th

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One cannot run at a loss when engaged with sales of non-timber forest products	3.1	19 th
Non-timber forest products contribute to job availability.	4.7	3 rd
Money is not spent on consumption of fresh fruits in the respondents	2.6	22 nd
Exploitation of non-timber forest products has provided packaging materials used in the respondents	4.4	5 th

HEALTH EFFECTS

Exploitation of non-timber forest products has improved the immunity of my respondents against diseases due to frequent herbal drugs used	4.9	1 st
Exploitation of non-timber forest products has encouraged the use of traditional medicine in the respondents	4.3	8 th
Exploitation of specific forest species (herbal plants) has reduced my belief in the potency of orthodox medicine	4.4	5 th

SOCIAL EFFECTS

Exploitation of non-timber forest product has improved expenditure on festivals/ceremonies	3.2	18 th
It gives access to acquire more material possession from money accrued from non-timber forest products	4.2	10 th
Non-timber forest products exploitation has enabled me to meet my family social responsibilities	3.9	16 th
Non-timber forest products exploitation contributed to popularity within the community	3.1	19 th
Exploitation of non-timber forest product has strengthened my belief in cultural and traditional belief	3.5	17 th

Source: Field survey, 2023

WMS: Weighted mean score

Conclusion and Recommendation

It was concluded that significant and divers of non timber forest products were exploited by the rural household members. Therefore, non timber forest products should be domesticated in order to ensure its continuous exploitation. Exploitation of non-timber forest products has improved the immunity of my respondents against diseases due to frequent herbal drugs used was the most prominent among the effects of Non Timber Forest Products (NTFPs) exploitation on

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