# SAFETY NET OF NON-TIMBER FOREST PRODUCTS AMONG THE INHABITANTS OF TAKUM, TARABA STATE.

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Abstract: Non-Timber Forest Products (NTFPs) are important safety net in Takum. However, there is a dearth of information on the species of NTFPs that are used as safety net in Takum. Therefore, safety net of NTFPs among the inhabitants in Takum was investigated. At 30% sampling intensity (Diaw *et al.*, 2002), 180 questionnaires were administered using multistage sampling procedure. Data generated was analyzed using simple percentages; t-test and logistic regression at α 0.05.The result on safety net of NTFPs indicated that, twenty two NTFPs are used as a safety net in Takum. The result of t-test indicated that, an average monthly income of ₦ 1,553.23, ±1062.74 was gotten from NTFPs. The result on level of dependence on NTFPs as a safety net in Takum indicated that, 50 respondents (28.6%) had level of dependence1-35% as safety net; 100 (57.1%), had 36-75% level of dependence while 25 (14.3%),  had 76-100 level of dependence on NTFPs as a safety net respectively. The result of logistic regression analysis showed that, occupation had odds ratio 518.35; Household size, 60.08; sex, 9.22; monthly income 8.41; Agro-ecological zone 5.85; Age, 5.22; Educational status 3.38 while monthly expenditure, meal per-day and richness had values lower than 2 respectively. Based on the major findings of the study, the followings are recommended; awareness; planting of NTFPs; raising seedlings of NTFPs; training people on other sources of generating income respectively.

**Keywords:** Community Livelihoods, Inhabitants, Non-Timber Forest Products, Takum and Safety net

## Introduction

The term "Non-Timber Forest Products (NTFPs)" refers to all biological resources, products and services other than timber that can be harvested from forest ecosystem for subsistence and trade (Shamly *et al*., 2002; Arnold *et al*., 2011; Bahru *et al*., 2012). They include fruits, nuts, spices, oils, vegetables, crafts, construction materials, fuel wood, charcoal, medicinal plants, fibers, resins, latex, gums, dyes, wild honey, bush meat, fish, rattans and bamboo.

Safety net of NTFPs refers to the role or service or functions provided by NTFPs during shocks or harsh climatic conditions such as when crops fail due to floods, drought, fire hazard, famine, war, crisis to mention but a few. During such periods, people are left with no option other than to fall back on NTFPs. This dependence on NTFPs at such difficult times to survive is term safety net. Most rural households in Takum derive multiple benefits from NTFPs available in their immediate environment. They rely on an array of NTFPs whose contribution extends beyond the direct-use value and associated cost saving to include indirect benefits and an important "gap-filling" and "safety-net" function (Delacote, 2002; Paumgarten & shackleton*2005*). Charlie and Sheona (*2004*) explains that,  safety net of  rural poor are continuously moving between troughs and peaks of food and economic security whereby households are involved in improving their livelihood outcomes or coping with vulnerability. Safety-nets could be viewed as the link between the troughs and the peaks; that is, they seldom offer a long-term solution to food and economic insecurity but they are essential in helping households mitigate the troughs. NTFPs as a safety-net offer both consumption and income smoothing options (Delacote *2002*). Consequently, it is argued that the safety-net function of NTFPs must not be endangered without providing viable alternatives. Large-scale land degradation or privatization therefore undermines livelihood security. NTFPs are important safety nets for communities, helping them cope with climatic shocks and pestilence.

 Many NTFPs are more resilient to climate variability and extremes than crops and so are crucial to the resilience of local livelihoods. If crops fail due to drought or assets are lost because of floods, Inhabitants can sell forest and tree products such as timber, fuel-wood, charcoal, wrapping leaves to mention but a few for income. They can also consume NTFPs such as forest fruits, nut and berries, mushrooms and bush meat as food. In addition, fodder from trees can help ensure the survival of livestock for months during harsh climatic conditions.

Safety net of NTFPs is dynamic and can be changed by either internal or external stressors. The strength of a given safety net is not only measured by its productive outcomes but equally it's resilience to shocks. Safety net can only be sustainable if the natural resources are sustained. Safety nets therefore describe the variety of ways in which people in different societies make a living or secure a livelihood. It is a system of live maintenance which can either be monetary or non-monetary in reward. The non-monetary activities include fetching of firewood and water for domestic use, collection of NTFPs such as snails, mush rooms, wild vegetables and herbs for family utilization. Monetary activities include harvesting of NTFPs such as snails, mush rooms, wild vegetables, fruits, nuts, seeds, medicinal plants and others for sales. Food insecurity militates against community livelihoods of the rural populace in Takum. Food security is vulnerable to extreme environmental challenges such as drought and floods. When the Sahelian region, Takum inclusive, suffered drought in the 1970s and 1980s; crop failure was remarkable throughout the region, Takum inclusive. Crops and livestock worth billions of naira were destroyed thereby affecting food, meat and dairy supplies throughout the country (Adebayo, 2002; 2012). During the said period (1970s and 1980s), communities in Takum falls back on NTFPs as a safety net to augment this agricultural shock but this is not documented in Takum. NTFPs are consumed locally all over the communities in Takum and have been their safety net. The use of NTFPs as a safety net in Takum takes three forms as follows;

1. Type or species of NTFPs not often used by inhabitants in Takum but now being used.
2. Increased consumption of harvested NTFPs over purchased items due to cash shortage by inhabitants in Takum.
3.  Increased sales of NTFPs in local markets in Takum.

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## Materials and Methods.

Takum is one of the 16 local government area of Taraba State, it is located between latitudes $6^0 30^1$ to $9^0 36^1$ N and longitude $9^0 10^1$ to $50^0$ E. Takum is bounded in the north by Ussa local Government Area, West by Wukari Local Government Area and East by Donga Local Government Area respectively. Takum has a population of **247,654** (NPC 2006).
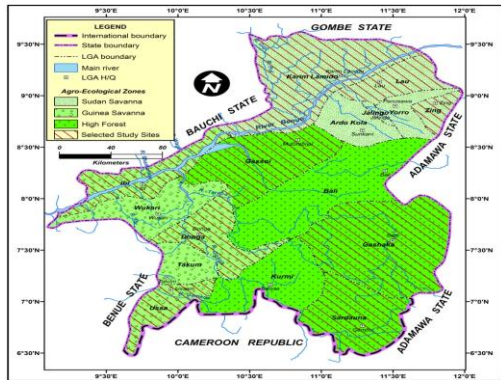


**Fig 1. Map of Taraba state showing the study Area (Takum) Source: Zaku (2013).**

### Survey Design

Multi –stage sampling design comprising of a three stage sampling technique was used for this study using 30% sampling intensity and the method of Diaw *et al*. (2002) as follows;
The first stage involved the division of Takum Local Government Area into two existing constituencies as follows;
 ➤ Takum 1; Manya, Chanchanji, Rogo, Gwahewetun and Dutse wards respectively.
 ➤ Takum 2; Fete, Kashimsbila, Bete, Shibon and Barki Lissa wards respectively
The second stage involved a random selection of three wards from each of the constituencies as follow:
 ➤ Takum 1. Manya, Chanchanji and Dutse wards
 ➤ Takum 2. Bete, Kashimbila and Shibon wards
The third stage involved a random selection of 30 respondents from each of the 6 wards there by bringing the total to 180 respondents for this study. Therefore, 180 questionnaires were developed and administered after validation to the selected wards in Takum to generate data for the study. Data generated was analyzed using simple percentages, t-test and Logistic regression analysis at α 0.05.
The mathematical model for the t-test is as follows:

$$t = \frac{\overline{X}_A - \overline{X}_B}{\sqrt{\frac{S^2(n_A + n_B)}{(n_A)(n_B)}}} \quad ...........................................................1$$

Where;
A = First group (e.g. Income from other sources)
B = Second group (e.g. Income from NTFPs)
$\overline{X}_A$ = Mean of group A (Income from other sources)
$\overline{X}_B$ = Mean of group B (Income from NTFPs)
$\overline{X}_A$ and $\overline{X}_B$ = arithmetic means for groups A and B
$n_A$ and $n_B$ = number of observations in group A and B
(note that $n_A$ and $n_B$ do not have to be the same)
$S^2$ = pooled within – group variance (for independent samples with equal variance).

The mathematical model for logistic regression analysis of a response P between 0 and 1 is given as follows;
Logit (P) = Log (P/l-P) = Log (P) – Log (l – P) --------------2

The simplest form of logistic model is expressed as:
Logit (Pi) = a + bx$_1$ ……………………….………………… 3
Pi = probability of dependence on NTFPs as a safety net by inhabitants of Takum.
Xi = Vector of predictor or independent variables (Factors that can influence dependence on NTFPs as a safety net by inhabitants in Takum).
a and b = regression parameters.
In binary choice models, the two possible results were assigned values of "1" or "0". In this study, respondents that said "Yes" to dependence on NTFPs as a safety net were assigned a value "1" and respondents that said "No" to dependence on NTFPs as a safety net were assigned a value of "0".
In this study, the binary logistic regression analysis was used to investigate the factors that influence dependence on NTFPs as a safety net by inhabitants in Takum. The factors that can influence dependence on NTFPs as a safety net investigated were; Age, Sex, Educational status, Monthly expenditure, Agro-ecological zones, Meals per day, Monthly Income, occupation, richness and Household size of the respondents respectively. The binary regression models obtained on dependence on NTFPs as a safety net can be presented as follows;

$$\text{Logit} \left( \frac{p}{1-p} \right) = Y = \beta_o + \beta_1 X_1 + B_2 X_2 ........... + B_n X_n \quad --4$$

Where;
B$_0$, B$_1$, B$_2$ …………….. B$_n$         =         Regression coefficient or model

                Parameters

X$_1$ = Sex of respondents
X2 = Age of respondents
X3 =Educational status of respondents
X4 = AEZ (Agro- ecological Zone) of respondents
X5 = Monthly income of respondents
X6 = Monthly expenditure of respondents
X7 = Occupation of respondents
X8 = Meals per day of respondents
X9 = Richness of respondents
X10 = Household size of respondents
Y = Dependence on NTFPs as a safety net (Binary variable)
***Logistic Regression Equations;*** ------------------ equation 5.
DONTFPs (SN) = SEX+AGE+EDS+AEZ+MI+ ME+OCCU+ MPD+RH+HHS
Where;
SEX = Sex of respondents
AGE = Age of respondents
EDS = Educational status of respondents
AEZ = Agro-ecological zone of respondents
MI = Monthly income of respondents
ME = Monthly expenditure of respondents
OCCU = Occupation of respondents
MPD = Meals per day of respondents
RH =Richness of respondents
HHS = Household size of respondents.
DONTFPs (SN) = Dependence on NTFPs as a safety net.

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*Safety net of non-timber forest products among the inhabitants of takum, taraba state.*

**Result and Discussion**

*NTFPs used as a safety net in Takum.*

The result on NTFPs as a safety net in Takum indicated that, all the respondents' uses NTFPs and a total of twenty two (22) NTFPs were found to be used as safety net in Takum (Table 1 and 2).

**Table 1: NTFPs Extracted from the buffer zone of Sonkpa Forest Reserve, Wukari.**

| S/N | Variables | No. of Respondents | Percentage |
|-----|-----------|--------------------|------------|
| 1. | Do you use NTFPs as a safety net in Takum? | | |
| | Yes | 175 | 100 |
| | No | 0 | 0 |
| | **Total** | **175** | **100** |

**Source: Field Survey, (2022).**

**Table 2: Compendium of NTFPs used as Safety net in Takum**

| S/N | Local Name (Hausa) | Scientific Name | Family | Live Form |
|-----|--------------------|-----------------|--------|-----------|
| 1 | Tsada | *ximenia Americana* | *Olacaceae* | Tree |
| 2 | Kuka | *Adansonia digitata* | *Bombacaceae* | Tree |
| 3 | Dorowa | *Parkiaya biglobosa* | *Leguminosae* | Tree |
| 4 | Kadanya | *Vitellaria paradoxa* | *Sapotaceae* | Tree |
| 5 | Gawo | *Faidherbid albida* | *Mmosaceae* | Tree |
| 6 | Soso | *Luffa cylindrical* | *Cucurbitaceae* | Climber |
| 7 | Zakami | *Datura metel* | *Solanaceae* | Herbs |
| 8 | Kawo | *Afzelia Africana* | *Leguminosae* | Tree |
| 9 | Madachi | *Khaya senegalensis* | *Meliaceae* | Tree |
| 10 | Madobia/Madrid | *Pterocarpus erinaceus* | *Papilionaceae* | Tree |
| 11 | Rimi | *Ceiba pentandra* | *Bombacaceae* | Tree |
| 12 | Gwandar daji | *Annona senegalensis* | *Annonacaceae* | Tree |
| 13 | Kafago | *Uapaca togoensis* | *Euphorbiaceae* | Tree |
| 14 | Muruchi | *Borassus aethiopum* | *Palmae* | Tree |
| 15 | Aduwa | *Balanites aegyptica* | *Zygophyllaceae* | Tree |
| 16 | Nama daji | Bush meat | Mammals | Mammals |
| 17 | Nama itace | Mushroom | Basidiomycetes | Basidiomycetes |
| 18 | Tsutsa | Caterpiller | Insect | Insect |
| 19 | Gara | Termites | Insect | Insect |
| 20 | Zuma | Honey | Insect | Insect |
| 21 | Fara | Grasshoppers/Locus | Insect | Insect |
| 22 | Kifi | Fish | Pisces | Pisces |

**Source: Field Survey, (2022).**

The high number of respondents that tick" Yes" implied that, all the respondents used NTFPs in one way or the other as a safety net in Takum. This corroborates Charlie and Sheona (2004).

Similarly, 22 NTFPs used as a safety net in Takum were drawn from trees, herbs and dietary supplement. The different species recorded implied that there are different NTFPs species in Takum. This means that Takum has diverse composition of NTFPs. The low number however recorded (22 NTFPs), implied that, there is serious deforestation going on in Takum.

*Income generated from NTFPs as a safety net in Takum.*

The result on t-test on income generated from NTFPs as a safety net in Takum indicated that, an average monthly income of ₦ 1,553.23, ±1062.74 was gotten from NTFPs while an average monthly income of ₦1,419.35, ±743.46 was derived from other sources in the study area (Table 3).

**Table 3: Monthly income generated from NTFPs as a safety net in Takum**

| Sources of income | Average (₦) | ±Sd | P-Value |
|-------------------|-------------|-----|---------|
| Income from NTFPs | 1553.23 | ±1062.74 | 0.62 |
| Income from other sources | 1419.35 | ±743.46 | |

**Source: Field Survey, (2022)**

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The result on monthly income generated from NTFPs as a safety net and income generated from other sources do not differ much (P>0.05). This implies that, the contributions from the two sources in terms of income are almost the same (p> 0.05). This means that, there is no significant difference among income generated from the two sources. This corroborates Zaku (2013) and Zaku *et al.* (2022). The finding suggests that, people can make a living on NTFPs as a safety net in Takum.

*Level of dependence on NTFPs as a safety net in Takum.*
The result on level of dependence on NTFPs as a safety net in Takum indicated that, 50 respondents (28.6%) had level of dependence1-35% as safety net; 100 (57.1%), had 36-75% level of dependence while 25 (14.3%), had 76-100 level of dependence on NTFPs as a safety net respectively (Table 3).

**Table 3: Level of dependence on NTFPs as a safety net in Takum**.

| S/N | Variables | No. of Respondents | Percentages |
|-----|-----------|--------------------|-------------|
| 1 | 1-35% | 50 | 28.6 |
| 2 | 36-75% | 100 | 57.1 |
| 3 | 76-100% | 25 | 14.3 |
| **4** | **Total** | **175** | **100** |

**Source: Field Survey, (2022).**

The highest number of 36-75%  recorded on level of dependence on NTFPs as a safety net in Takum implies that, many people survive moderately on NTFPs during shocks. This corroborates Zaku (2013) and Zaku *et al.* ((2022). The finding suggest that, majority of the people in Takum moderately depends on NTFPs as a safety net during harsh economic and climatic conditions. This level of dependence may be viewed in terms of food, sales of forest products, building and energy materials, livestock feeds and herbs for solving human health challenges. It may also take three forms as follows; Type or species of NTFPs not often used by inhabitants in Takum but now being used; Increased consumption of harvested NTFPs over purchased items due to cash shortage by inhabitants in Takum and increased sales of NTFPs in local markets in Takum.

*Logistic binary nature of factors that influence dependence on NTFPs as a safety net in Takum.*
The result of logistic regression analysis on factors that influenced dependents on NTFPs as a safety net in Takum indicated that, Occupation of respondents was the most significant factor that influenced dependence of NTFPs in Takum with odds ratio 518.35 followed by Households size (60.08; Sex, (9.22); Monthly income (8.41); Agro-ecological zone (5.85); Age, (5.22); Educational status (3.38) respectively while Monthly expenditure, Meal per-day and Richness had values lower than 2 respectively. The decision rule is that, all factors that have odds ratio 2 or greater than 2 influenced dependence on NTFPs as a safety net while  those that have negative values or values lower than 2 do not influence dependence on NTFPs as a safety net in Takum (Table .4).

**Table 1.4: Logistic regression analysis of factors that influence dependence on NTTFPs as a safety net in Takum**
**Dependent variable (Dependence on NTFPs as a safety net in Takum)**
**(Presence = 1; Absence = 0)**

| Independent Variables | Coefficient | Odds- ratio |
|-----------------------|-------------|-------------|
| Whether AGE influence dependence on NTFPs as safety net | 2.22 | 9.22* |
| Whether SEX influence dependence on NTFPs as safety net | 1.65 | 5.22* |
| Whether EDS influence dependence on NTFPs as safety net | 1.22 | 3.38* |
| Whether AEZ influence dependence on NTFPs as safety net | 1.77 | 5.85* |
| Whether MI influence dependence on NTFPs as safety net | 2.13 | 8.41* |
| Whether ME influence dependence on NTFPs as safety net | 0.68 | 1.28ns |
| Whether OCCU influence dependence on NTFPs as safety net | 6.25 | 518.35* |
| Whether MPD influence dependence on NTFPs as safety net | - 41.09 | 0.00ns |
| Whether RH influence dependence on NTFPs as safety net | - 0.71 | 0.49ns |
| Whether HHS influence dependence on NTFPs as safety net | 4.09 | 60.08* |

Model $X^2$ (df =10) = 419.48*

Note P< 0.05 , ns = Not Significant, * = Significant.

**Source: Field Survey, (2022)**

The highest odds ratio of above 2 recorded on occupation, household size, sex, Age, Educational status, Agro- ecological zone and monthly income implies that, they are factors that influenced dependence on NTFPs as a safety net in Takum. This is because they have odds ratio above 2. Therefore this means that, the variables or factors are significant. This agreed with Zaku (2013) and Zaku *et al.* (2022) as well as Deeks (1996); Blands and Altman (2000) that, logistic model provide information on the consequences of one variables on the other. The occupation of respondents can influenced dependence on NTFPs as safety net in that, some occupation such as farming, fishing e.t.c are faced with shocks such as floods, climate change, fire hazard, fish poisoning e.t.c and people in such occupations may  fall back on the harvesting and utilization of  NTFPs as a safety net because  they do not have alternatives that generate daily income. Similarly age of the respondents can also influence dependence on NTFPs as a safety net in that, the elderly tend to depend more on the

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consumption of NTFPs than the younger ones in terms of forest food and using medicinal herbs to solving human health challenges. Sex of respondent also influenced the used of NTFPs as a safety net in that, women are involve in less strenuous activities while their male counterparts do the strenuous activities. Similarly the Educational status and monthly income equally influenced dependence on NTFPs as safety nets because they have alternatives which is the education and the money at their disposal. Similarly Household size and Agro-ecological zone do influenced dependence on NTFPs as safety net because, those in high forest zone such as Gembu, (Sardauna), Kurmi, Gashaka as well as those in Guinea savanna such as Ussa, Takum, Wukari, Ibi e.t.c consume more of NTFPs because of their proximity to the forest compared to those in Sudan savanna such as Jalingo, Ardokola to mention but a few. Similarly, monthly expenditure, which is what one spends per month, has nothing to do with the consumption of NTFPs as well as meal per day. Also, richness does not prevent the consumption of NTFPs as a safety net in Takum. The above corroborates Zaku *et al.* (2022) respectively.

## Conclusion
The major findings of the study include; Twenty two (22) NTFPs are used as a safety net in Takum. The average monthly income of ₦1,553.23 and ₦1419.35 were generated from NTFPs and other sources respectively. Most of the respondents depend moderately on NTFPs as a safety net. Factors such as Sex, Age, Educational status, Agro-ecological zone, Monthly income, Occupation, and House hold size were found to influenced respondent dependence on NTFPs as a safety net while Meal per-day, Richness and Monthly expenditure do not influenced respondent dependence on NTFPs as a safety net.

## Recommendations
Based on the major findings of the study, the followings are recommended;

1. Takum is diverse in terms of NTFPs composition. However the low number of NTFPs recorded as compendium signifies serious depletion in the study area. There is the need therefore for the creation of awareness on the significant contributions of NTFPs as a safety net. This is because, when people know the value of NTFPs as a safety net, they will not destroy it by way of over exploitation.
2. People should be encouraged to plant NTFPs used as safety nets on their farms and around their houses to reduce the pressure on the wild ones.
3. State and Local Government should raise seedlings of NTFPs which are used as safety nets and to supply such to the inhabitants of Takum at a subsidized rate.
4. People should be educated on the impact of their harvesting methods on the environment and the need for sustainable harvesting methods.

## Conflict of interest;
There was no conflict of interest among the Authors.

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