

**INVENTORY OF FOREST FOODS IN RURAL AREAS OF OYO STATE, NIGERIA****Olawumi, A.T**\*Email: [olawumiat@taused.edu.ng](mailto:olawumiat@taused.edu.ng)**Banjo, O.S**Department of Agricultural Science, Tai Solarin University of Education,  
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Email: [banjoos@tasued.edu.ng](mailto:banjoos@tasued.edu.ng)**ABSTRACT**

*Forest supplies diverse products to mankind especially in the area of wild plants and animal food products. This research involved an inventory survey of forest foods in rural Areas of Oyo state, Nigeria. The research identified and described the socioeconomic characteristics of the respondents; identified the available edible forest/wild plants and animals; determine the contribution of forest foods to nutrition and food security among the respondents as well as to identify and describe major problems facing forest foods collection. Primary data were collected from 150 respondents selected through random sampling techniques from seven Districts of the Local Government. The data were analyzed using descriptive statistics, logit regression and Pearson Correlation Coefficient. The findings showed that a greater part of the respondents (58%) were male and 87% of the respondents were married. The results revealed that 47% of the respondents were in their active ages between 41-60 years and 76% of the respondents had family size of 1-5 persons. The study further revealed that over whelming majority of the respondents made use of forest food products. The major problem encountered by forest products users were unavailability of forest food products in the off season. Based on the findings, it was suggested that, there should be provision of good storage facilities and orientation of the farmers on modern ways of preserving wild foods to make them available throughout the year through staggered planting and processing.*

**Keywords:** *Logit Regression, Forest Foods, Wild Plants, Storage, Afjio***INTRODUCTION**

Forests have a variety of uses to humans including wood from trees, nutrition from animals, grazing, recreation, medicinal plants and so on. Over the years' forest and its products have contributed immensely to the economic development of Nigeria; the importance of the products cannot be over-emphasized (Fonta *et al.*, 2010). Nearly 500 million people around the world depend on forests for their livelihood among them are a high number of forest and woodworkers. Sustainable forestry management includes safe, stable jobs with adequate wages and working conditions (Bowler, *et. al.*, 2000).

International Tropical Trade Organization (ITTO, 1997) defined sustainable forest management as the process of managing forest to achieve one or more continuous flow of desired forest products and services.

Non-timber forest products (NTFP) are any product or service other than timber that is produced in a forest (Center for International Forestry Research, CIFR, 2004). They include fruits, nuts, vegetables, fish, medicinal plants, resins, essence, a range of barks and fibers, bamboo, rattans, honey, insects and animals. About 80% of the population of the developing world depends on NTFP for their primary health and nutritional needs (FAO, 1995). Edible food materials found in the forest include insects, rodents, wild game and fish which have been found to have superior nutritional quality when compared with domesticated varieties and they help to ensure all year-round food supply (Jimoh and Adebisi, 2005). Forest foods are nutritionally important and are traditionally used as supplements to the staple diet especially when food crops fail.

Food and Agriculture Organization (FAO, 1995), opined that food security “exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. Malnutrition increases the risk of infection and infectious disease and moderate malnutrition weakens every part of the immune system (Minkler, 2000).

The principal protection foods are vegetables such as tomatoes, garden eggs, okra, onion, pepper, cabbage, all edible green leaves (cassava, baobab, taro, bean, melon, okra leaves, spinach, lettuce). Fruits provide vitamins, sugar and some food fibers to the body especially pawpaw, orange, lemon fruit, grapefruit, pineapple, avocado, mangoes, banana, dates, figs, grapes. Adequate nutrition is essential to ensure adequate growth and protection against diseases. Proper feeding does not require huge amounts of money. African agriculture and forests offer a variety of products which can be used to enjoy a very affordable balanced diet. However, the population very often does not know how to use these products or they do not know how to adapt the food to specific needs of each member of the family (CTA, 2001).

Hidden hunger, also known as micro nutrient deficiencies, afflicts more than two billion individual people globally (FAO, 2015). Its effects can be devastating, leading to mental impairment, poor health, low productivity and even death. Poverty is the main reason for hidden hunger, lack of minerals and vitamins in the diet result in hidden hunger.

Diet diversification is one of the most effective ways to sustainably prevent hidden hunger (Thompson and Amoroso, 2010). Forest foods contain essential micro-nutrients which are derived from leaves, seeds, nuts, fruits, mushrooms, honey, insects and wild animals (FAO, 2015).

People eat more wild foods – including those from forests and trees – in seasons when other food is less plentiful (Olawumi and Adedokun, 2018). For some households, forests also serve as safety nets in terms of scarcity. Having access to wild foods for both household consumption and sale can increase household diversification and hence strengthen their resilience to climate variability and external shocks.

Forests and trees outside forests contribute to the livelihoods of more than 1.6 billion people and forest foods including products from trees, herbs, mushrooms and animals, contribute in many ways to improving food security by providing ready accessibility to affordable and often highly nutritious food. Forest products can also be sold in times of crisis to earn the income needed to ensure food security (Fanzo, 2013).

Afijio Local Government Area of Oyo State Nigeria is endowed with abundant forest land cover with diversified flora and fauna that serves as various purposes among the residents; the current study is primarily focused on carrying

out an inventory of the available wild plants and animals that are consumed as either main or supplementary diets among the residents of the study area with a view to offer a reliable data bank for further research and policy formulation and planning purposes. The study will also offer guidance on sustainable ways of harvesting the identified resources to ensure perpetual service to mankind.

The scope of the current research was to carry out a pilot study through survey of the available forest/wild food products in Afijio Local Government Area of Oyo State, Nigeria to serve as a guide into carrying both state wide and National survey for policy and action recommendations towards achieving food security and sustainability in Nigeria.

## MATERIALS AND METHODS

The study was conducted in Afijio Local Government of Oyo State, Nigeria. It lies in the South-Western Zone which is roughly enclosed by latitude 7.8° North and longitude 3.9°E of the Equator. It covers a total land area of 1.365 square kilometers, with about 30 towns and villages. Afijio Local Government Area has a population of 84,504 million (National Population Commission, NPC, 2006). The Local Government is bounded in the West by Akinyele Local Government in the East by Oyo West Local Government, in the North by Iseyin Local Government and in the South, Lagelu Local Government. Major towns in the Local Government include, Akinmoorin, Aawe, Ilora, Ilu-Aje, Imini, Iware, Jobele and Fiditi. The major occupation of the people is farming and the major crops grown are fruits and vegetables. It has an equatorial climate with dry and wet seasons and relatively high humidity. The average daily temperature ranges between 25°C and 35°C. The vegetation pattern of the area is that of rain forest in the South and Guinea Savannah in the North (NPC, 2006).

Primary data were collected from 150 respondents (forest users, farmers, consumers and forest product sellers) selected through random sampling techniques from seven Districts of the Local Government. Information gathered from them includes socioeconomic characteristics, uses or non-use of forest foods, reason for or against consumption of forest foods, types of forest foods collected and used, season of collection, methods of harvesting, storage procedures, etc. The data were analyzed using descriptive statistics, logit regression and Pearson correlation coefficient. Logistic regression was adopted as a predictive analysis to describe the relationship between the dependent binary variable (use/non-use of forest foods) and selected independent variables (socioeconomic variables) such as age, sex and level of education. of the respondents in determining their decision to use or not to use forest foods in the study area.

Pearson Correlation was used to investigate the degree of linear association and the direction of associations between selected socioeconomic variables investigated in the study.

## RESULTS AND DISCUSSION

Table 1 shows that 58% of the respondents are female within the economically active age which is not surprising because female tends to get involved in food processing more than their male counterparts. Generally, women are often responsible for preparing food and have a chance to educate their children about beneficial food and health habits. Food preparation requires an average of 2-3 hours per day; it is time and labor consuming because of the rudimentary methods used in preparation (Saito, 1992). In terms of marital status, the majority (87%) of the respondents were married with (76%) having household members of 1-5 and this is expected to boost labor input in the family farm as well as non-timber forest products collection and processing for consumption and sales to boost family income and livelihoods. This is consistent with the findings of Egiou (2003) that married person plays more active role in agricultural production.

Overall, most of the respondents were holders of primary school leaving certificate (41%) and secondary school certificate (45%) who due to farming or financial constraint could not afford to further their education. High illiteracy and low enrolments rates, especially in secondary schools affect women's ability to acquire the skills needed for income-generating activities and will have repercussions for generations to come (CTA, 2000). About 60% of the respondents were farmers, 31% were traders and the remaining were engaged in civil service.

The educational attainment of an individual is influenced by a number of factors including socio-economic background, access to quality education, awareness, interest, parental influence and government policies. (Afolami, 2014). The few respondents (14%) that had opportunity to have formal education up to tertiary level are likely to constitute the bulk of those in the civil service and their educational attainment is expected to impact their taking informed decisions on different aspects of life including nutrition, investment, savings and health. The basic factors that determine women's capacity for survival are highly diverse, depending on their age, income and other socio-cultural factors. However, there are common health-related factors that affect their capacity to carry out economic activities – nutrition, water and health services (CTA, 2000). Access to health services depends not only on availability but also on cost of services and the ability to pay (CTA, 2000).

**Table 1: Socio- economic characteristics of the respondents (N=150)**

Variable	Frequency	Percentage (%)
<b>Gender</b>		
Male	63	42
Female	87	58
<b>Marital status</b>		
Single	36	13
Married	114	87
<b>Age</b>		
Below 20	4	3
21-40	62	41
41-60	71	47
Above 60	13	9
<b>Household size</b>		
1-5	114	76
6-10	36	23
<b>Educational qualification</b>		
Pry sch. certificate	62	41
SSCE	67	45
Tertiary	21	14
<b>Major occupation</b>		
Farming	88	59
Trading	47	31
Civil servant	15	10

Table 2 shows the list of identified twenty-two edible wild plants consumed as food in the study area in the form of vegetables, fruits and condiments in the study area. Most of these plants contain various quantities of essential micro and macro nutrients especially useful in curtailing hidden hunger or micronutrient malnutrition (Olawumi and Adedokun, 2018). Most people consume too little protein and energy to sustain a healthy weight, and suffer from deficiencies in composition of their diets that leave them vulnerable to disease (FAO, 2015). The overall incidence of all kinds of under-nutrition is much higher in developing than in industrialized countries. The type of under-nutrition caused by shortage of food is called protein-energy malnutrition; and is often associated with infectious diseases such as measles and diarrhea leading to high premature death among children in South Asia and Africa (Millstone and Lang, 2008). In addition, the immune system of the resident's body will also be improved through the consumption of these identified free gifts of nature that are readily available in the study area. This will go a long way towards attaining the sustainable development goal number 2 which aims at ending hunger, achieve food security and improved nutrition and sustainable

agriculture especially among children, adolescents and aged people.

**Table 2: List of identified wild edible plant foods in the study area**

English Name	Botanical Name
Mushroom	<i>Agaricus bisporus</i>
Cherry	<i>Prunus auium</i>
Bitter leaf	<i>Vernonia amugdalina</i>
Wild lettuce/Dandelion Green	<i>Taraxacum officinate</i>
African spinach	<i>Amaranthus hybridus</i>
Lagos spinach	<i>Lelosia argentea</i>
Water leaf	<i>Talium triangulare</i>
Egg plant	<i>Solanum macrocapon</i>
Malabar spinach	<i>Basella alba</i>
African basil	<i>Ocimum gratissimum</i>
Bologi	<i>Solaneclo biatrae</i>
Pumpkin leaf	<i>Telfairia occidentalis</i>
Moringa	<i>Moringa oleifera</i>
Mango	<i>Mangifera indica</i>
Cashew	<i>Anacardium occidentale</i>
Kolanut	<i>Sterculiaceae colavera</i>
Sheanut	<i>Butryospermum parkii</i>
Palm fruit	<i>Elaeis guineensis</i>
Walnut	<i>Jugians regia</i>
Guava	<i>Psidium guajava</i>
“Ackee”	<i>Blighia sapida</i>
“Awin”	<i>Pialium indum</i>

Table 3 shows the list of identified edible wild animals available and consumed in the study area. In all, twenty edible wild animals were identified in the study area to be consumed in various ways (cooked, roasted or both). Increasing urban poverty goes hand in hand with growing food insecurity and malnutrition in the cities (Dubbeling, *et al*, 2010). Hunger in the cities is chronic but is less visible and attracts much less attention from the media and policy makers. Moreover, the nutritional value of foods consumed by the urban poor is often very low (Mutonodzo, 2009). The availability of these wild animal meats as supplements to conventional livestock production systems offers a ray of hope in closing the gaps and shortfalls in protein nutrition in the study area and hence, ensure that the residents are able to live healthy and keep strong. Protein malnutrition is an established challenge in the world especially in developing countries like Nigeria. Availability and access to these protein foods from the wild will safeguard against nutritional disorders associated with protein deficiencies and death especially among pregnant women and growing children under the age of five as

stipulated in the sustainable development goal number 3 which aims at ensuring healthy lives and promote well-being for all ages.

**Table 3: List of identified wild edible animal foods in the study area**

English Name	Botanical Name
Snail	<i>Phylum mollusk</i>
Wolf	<i>Canis lupus</i>
Toad	<i>Bufo bufo</i>
Guinea fowl	<i>Numida Meleagris</i>
Boar	<i>Sus scrofa</i>
Jaguar	<i>Panther once</i>
Buffalo	<i>Bubalus arnee</i>
Grass cutter	<i>Thryonomus swinderianus</i>
Leopard	<i>Panthera pardius</i>
Elephant	<i>Loxodonta Africana</i>
Crocodile	<i>Crocodylus acutus</i>
Monkey	<i>Macca fascicularis</i>
Squirrel	<i>Sciurus carolinensis</i>
Bat	<i>Tacca chantries</i>
Snake	<i>Venomous</i>
Lion	<i>Panther leo</i>
Antelope	<i>Annova reticulate</i>
Honey Bee	<i>Apis mellifera</i>
Deer	<i>Cervidae</i>
Tiger	<i>Panther tigris</i>

Table 4 shows that gender of respondents was negatively correlated with type of building lived in though with a negative sign at 0.05 level of significance ( $r=-0.0281$ ), while age of respondents was positively correlated with size of farm possessed with a positive sign at 0.05 level of significance ( $r=0.0178$ ). Marital status of respondents was positively correlated with the type of building lived in with a positive sign at 0.05 level of significance ( $r=0.206$ ). Educational qualification of respondents was positively correlated with type of building lived in and form of house owned with a positive sign at 0.1 level of significance ( $r=0.208 - 0.0212$ ). Handa, *et al*, (2004) reported that the impact of community infrastructure on household behavior may also depend on the education of adults or parents, because of differences in preferences or access to information. In child health literature, for example, the impact of mother's education has been found to vary significantly with community characteristics such as sewerage and sanitation conditions (Thomas, *et. al.*, 1991). Household size of respondents was negatively correlated with type of building lived in though with negative sign at 0.05 level of significance ( $r=-0.0177$ ). Occupation of household head was negatively correlated with type of farmland possessed though with a negative sign at 0.05 level of significance ( $r=-0.0187$ ). Security of tenure is key to

improving living standards of people who depend on the land for their food and livelihood. Without such security, there is little incentive to improve the soil, irrigation or livestock ownership of land and investment in improving it, can form a “virtuous circle” essential for economic and social development (Millstone and Lang, 2008). On a general note, poverty increases with household size. For example, higher poverty level 88.7 percent was recorded amongst households with more than 20 persons relative to 42.3 percent in households with 2-4 persons (National Bureau of Statistics, NBS, 2011). Education of adults in households provides higher levels of welfare for the households and affects poverty level (Afolami, 2014).

**Table 4: Analysis of Socio-economic Characteristics and Livelihood of Respondents**

Socio-economic Characteristics	Size of farm	Types of farm land	Types of building	Form of house owned
Gender				
r	0.013	0.084	0.281*	0.095
p	0.874	0.304	0.000	0.248
Age				
r	0.179*	0.019	0.129	0.003
p	0.28	0.822	.116	.973
Marital status				
r	0.159	0.132	0.206*	0.04
p	0.052	0.106	0.11	0.960
Educational qualification				
r	0.030	0.017	0.208*	0.212*
p	0.720	0.838	0.011	0.009
Household size				
r	0.037	0.005	0.177*	0.119
p	0.650	0.948	0.030	0.147
Occupation of household head				
r	0.089	0.187*	0.050	0.075
p	2.78	0.022	0.545	0.364

\*\* Correlation is significant at the 0.01 level (2-tailed)

\*Correlation is significant at the 0.05 level (2-tailed)

Table 5 shows that the logistic regression results for determinants of forest foods consumption and the socio-economic characteristics of the respondents as they affected the odds in favour or against it. The model estimated explained about 81% (0.80667) of total variation in the dependent variable. This is evidenced from the Cragg-under R-square value of 1.0000. Though, none of the estimated variable

significantly affect the odds in favour or against the consumption of forest foods; sex of the respondents and household size tended to increase the odds in its favour, while age of respondents, educational attainment, farm size and tools owned by the respondents decreased the odds in its favour.

**Table 5: Logistic regression analysis of the determinants of forest food consumption in the study area**

Variable Name	Estimated Co-efficient	Standard Error	T-Ratio
SEX	18.633	52877	0.35239E-03
AGE	18.333	34244	0.53535E-03
EDU	1.2257	42611	0.28764E-04
HHSZ	11.271	25603	0.440233-03
FARMSZ	-4.6380	18641	-0.24880E-03
TOOLSC	-4.6380	18641	0.24880E-02
CONSTANT	-394.40	0.26938E+06	-0.14641E-02

SCALE FACTOR = 0.14275E - 48  
 LOG - LIKELIHOOD FUNCTION = -0.85379E - 08  
 LOG OF LIKELIHOOD RATIO TEST = 147.306  
 CRAGG - UNDER R-SQUARE = 1.0000  
 ADJUSTED FOR DEGREES OF FREEDOM= 1.0000  
 APPROXIMATE F - DISTRIBUTED = 0.97049E + 10  
 NAÏVE MODEL PERCENTAGE OF RIGHT PREDICTIONS = 0.80667

## CONCLUSION AND RECOMMENDATIONS

It may be concluded from the study that the majority of the respondents relied on forest food products for adequate nutrition though they encountered scarcities during off season. Based on the findings, it was suggested that, there should be provision of good storage facility and orientation of the farmers on modern ways of preserving wild foods to make them available throughout the year through staggered planting and processing.

Processing food products helps to reduce losses that occur during transportation or storage. Processing can therefore help to develop agriculture and improve efficiency of various agricultural marketing channels. It is a way of increasing the market and nutritional value of products.

Staggered planting of already domesticated species will ensure maturity at different times of the year thereby forestalling overproduction at any given time that may eventually lead to wastage of foods especially in the event of inadequate or outright absence of good storage facilities in the food production areas as well absence of other infrastructures like good road network to move fresh foods to markets and final consumers.

In addition, government intervention in the form of access to finance and subsidy will also go a long way in empowering farmers to produce more foods through efficiency in production, reduction in post-harvest losses due to ability to acquire essential machines to carry out their production activities. Producers and Processing Organizations should be organized to afford stakeholders to pull their resources together to acquire necessary machinery for production and

processing as well as combined and robust ability to negotiate for better pricing of inputs and outputs especially with Government and other corporate bodies.

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