# RESEARCH ARTICLE

# DEMAND FOR NON-TIMBER FOREST PRODUCTS IN AKURE METROPOLIS

## Adepoju, A.A., Oladeebo, J. O. and Ojedokun, I.K.

Department of Agricultural Economics, Ladoke Akintola University of Technology, Ogbomoso, Nigeria

## ABSTRACT

This study was carried out to examine the household demand for NTFPs in Akure Metropolis in Ondo State of Nigeria using a simple random sampling to select household from each of the two wards from Akure North and South Local Government Areas. A systemic sampling technique was used to select household from each ward and a sample size of 89 respondents was obtained. Data collected were analyzed using descriptive statistics and AIDS model. The descriptive statistics was used to identify and describe the socio economic characteristics of the respondents while AIDS model was used to estimate the demand for Non timber forest products in the study area. The study revealed that the average age of the respondent is 45 years, 83.1percent of them were married, 78.7 percent of the respondents were Christians while 42.7 percent had tertiary educational background. Majority of the respondents that consume NTFPs were females while 87.6 percent of the respondents live within the vicinity where NTFPs can be found. The uses to which NTFPs products are put includes; consumption purposes, medicinal purposes, ceremonial and traditional rites. The five selected NTFP for the study are moinmoin-leave, bushmeat, snail, kola and garden-egg. For products used, owned price elasticities are less than unity in their absolute terms implying that their demand is inelastic. Result further reveals that an inverse relationship exist between household expenditure and budget share on bushmeat, lastly, the expenditure elasticity selected NTFPs considered are all positive except garden egg.

*Key Words:* NTFP Products, Elasticities, Akure Metropolis.

## INTRODUCTION

Non-timber forest products (NTFPs) are plants or plant parts that have perceived economic or consumption value sufficient to encourage their collection and removal from the forest. That is, they are those items harvested or removed from the forest lands for private use or for resale (excluding, saw-timber, pole timber, natural gas, oil, sand, gravel, shale and building stone and all of which are covered under other sections). It can also be reffered to as all the products that may be extracted from forest ecosystem and are utilized within the household or are marketed or have social, cultural or religious significance (FAO,2001). These include plants and plants materials used for food, fuel, storage and fodder, medicine, cottage and wrapping materials, biochemical as well as animals, birds, reptiles and fishes, for food and feather, games animal for bearers, nuts and seed, berries, mushroom, oils, foliage, fuelwood, mechanical plants.(Aiyeloja *et al*., 2006). NTFPs which are harvested from within and on the edges of natural and disturbed forest, may be all or part of living or dead plants, lichens, fungi or other forest organisms. It therefore, represents a diversity of potential product sought after by a wide variety of people on a continuum of scale and intensity. Unlike timber-based products, NTFPs came from a large variety of plant part and are formed into a divers set of products: leaves and twigs that may be component of decorative arrangements, food items

such as fruits, fungi and juice, wood carved or woven into pieces of art or utilitarian objects and roots, leaves and bark processed into herbal remedies or medicine. Like timber, NTFPs may further be processed into consumer oriented products (Aiyeloja and Ajewole, 2006). Description of these products may pose a problem due to lack of information concerning the distribution system used to get the product to final consumers. NTFPs are found in a wide variety of outlets e.g. health food store, pharmacy e.t.c. unlike timber-based products. People have benefitted from those plants from generation. In some cases, NTFPs according to Hammett and Chamberlain (1998) contribute significantly to local and regional economies and with the current trend in the trade and use of NTFPs, it is bound to grow substantially over the next decades. Rijsoort (2000) defined NTFPs as all tropical forest products plant and animals or part thereof other than industrial timber, which are (or can be) harvested for human use at the level of self-support or for commercial purposes some definitions also include small animals and insects.

A few examples of many thousands of different kinds of NTFPS include mushroom, ferns, tree broughs, transplant maple syrup, moss, rubber, honey from bees raised in or near forest, vines, oils, resins, cascara bark and ginseng products are commonly grouped into categories such as floral greens, flavours, fibres, decoratives, sap and resins. The potential economic value of NTFPs either in terms of utilization or their market value is often under-estimated or unknown (Wickens, 1994). NTFP activities hold prospects for integrated forms of development that yield higher rural income and conserve

*Corresponding author: Adepoju, A.A,*
*Department of Agricultural Economics, Ladoke Akintola University of Technology, Ogbomoso, Nigeria*

biodiversity while not competing with agriculture (Sharma, 2005). Non timber forest product constitutes a critical component of food security as an important source of income for the poor in many developing countries. Sustainable use and correct valuation of NTFPs is a topic of increasing importance as more attention begins to be paid on the potential of forest which reduces poverty. In the past, the rationale for forest conservation was simply to sustain the forest role for the timber industry. However in many countries over the past 5 years another view has emerged that formally acknowledge the importance of local use of forest with the rise of extractive reserves in Brazil, community forest in Nepal joint forest management in India and similar initiative in many other countries local people are gaining access to significant benefit from NTFPS.

The common property resources produced by NTFPS are fuel wood, charcoal, fencing, poles, fodders, medicinal plants and varieties or food stuff such as games animals, fruits, nuts, mushroom, fibre and resin (Arnold, 1995). Gone are those days when NTFPs were exclusively free of charge for anybody that could go into the forest to fetch them. Due to the relative scarcity of most of the NTFPs now as a result of deforestation as noted by Nwoboshi (1986) and the present awareness of their importance more value is being added which has made it highly demandable and marketable. A non-timber forest product contribution to livelihood security is becoming relatively good because of the gain and importance which the society and the world as a whole attached and derived from it.

**Statement of the research problem**

Conservation agencies are addressing the issue of sustainable production of NTFPs but there are still some number of challenges which has to be dealt with some of which include the disappearing of forest cover, inequitable market access of marginalized population and monopolization of high value NTFPs by longing and poaching mafia.Challenges such as insecure land tenure, inequitable access to market, that the danger of low value NTFPs as poverty traps will have to be addressed first by the people dealing with forest product. Concerning the case of timber, government has neglected the capacity of promoting sustainable NTFP use and facilitates increase of financial benefit to local users as incentive for forest conservation is consequently low. There are many gaps in our understanding of the range of products used from forest, their taxonomic classification socio-economic values, technical package and policy contexts for their sustainable use. (Ros-Tonen, 2001). Existing knowledge and expertise is poorly documented and inaccessible which mean many are duplicated whilst many important issues remain neglected.

There is a lackof appropriate methods and tools of promoting sustainable use of NTFPs and successfulregulation of trade and the relevant lessons from the field are rarely examined to inform policy development. The challenge is to make the most efficient use of existing knowledge and experience of facilitators, entrepreneurs and researchers in this region. This can be done by identifying, connecting and engaging such people in a range of networking activities that stimulate the flow of information and learning and which yield products of

immediate interest and conservation of non-timber forest products initiatives,(FAO,1995). There are some disadvantages battling with the NTFP as a development mechanism for poor communities. Firstly, those collectors who are mostly in need of income support from NTFP but have the poorest developed skills, lack resources to store, process and market their produce and face prejudice and unfair treatment because of their social status. Secondly, it can expose collector and their dependents to widely fluctuating income because of the price variations in local and global market. Thirdly, in the long term there is also the risk that the price of some NTFPS will decline as factory-made alternatives such as plastic contains for bamboo and reed baskets plastic for ratten furniture become more widely available. Fourthly, the institution built for commercial NTFPs production requires more time and resources than any other development option (Gubbi, 2006).

Aside all the problems mentioned above, low productivity, underdevelopment as well as low standard of living affect the non-timber forest product terribly. There are challenges in meeting the demand of the people who really needs this product for their well-being either for pharmaceutical and for commercial use or for human consumption. If this problem can be solved then every other part will be tracked out. In the area of underdevelopment, if government refuses to develop the forest product, there will be a limit to the use of product. The production will not circulate and the amount of product required to be consumed by the consumer may not be available. In view of the issues raised the study identified the socio-economic characteristics of NTFPs consumer, examined the diversity of NTFPs extracted and their uses and estimate the expenditure on NTFPs consumed by household.

## MATERIALS AND METHODS

The study was carried out in Akure metropolis area of Ondo State which consists of Akure South and Akure North Local Government Area. Akure is situated in the South-Western Part of Nigeria with geographical location of latitude $7^0$ $15^1$ 0 North, $5^0$ $12^1$ 0 East as the longitude. The area is characterized by a fairly high temperature of about $28.7^0$C and the annual rainfall is above 1200mm.Akure is one of the cities in the South Western region of Nigeria and it is the largest city and capital of Ondo State. The city has a population of approximately 387,087. The people are of Yoruba ethnic group, Akure is the trade centre for farming region where yam, cassava, cocoa, corn and tobacco are grown. Cotton is also grown which is used in weaving cloth. Akure metroplis consists of two local governments which is Akure north and Akure south.Akure south has 16 wards while Akure north has 15 wards which has a total number of 31 wards. Simple random sampling was used in selecting 6 wards while systemic sampling techniques was used to select 16 households from each making a total sample size of 96 respondents, however 89 respondents whose details were adequate were used. Structured questionaire was used as the main instrument in the collection of data from the respondents. The researcher personally collected the data between the month of August and September. The technique of data analysis involved the use of descriptive statistics as well as the Almost Ideal Demand System (AIDS) model. AIDS model was used to analyze data

collected because of its theoretical and pratical consideration and popularity in demand analysis.According to Deaton and Mullbauer, (1980), the AIDS model gives an arbitrary first order approximation to any demand system. It satisfies the axioms of choice exactly in that it aggregates perfectly over consumers without involving parallel linear Engel Curves, and it has a functional form which is consistent with known household budget data. It is simple to estimate, largely avoiding the need for non-linear estimation, and it can be used to test the restrictions of homogeneity and symmetry through linear restrictions on fixed parameters. In its final formulation, the AIDS model as developed by (Deaton and Mullbauer, 1980) is expresed as follows:

$$W = \alpha_i + \Sigma_j Y_i ln P_j + \beta_i ln\,(x/\,P)\ I_j = 1\ldots n \qquad (1)$$

The price index Inp can further be defined as
$$InP = \alpha o + \Sigma_i \alpha j\ ln P_i + \frac{1}{2}\Sigma_j \Sigma_i Y_{ij} ln P_i ln P_j \qquad (2)$$

where:

$W_i=$ budget share of ith commodity, $P_i=$ price of jth commodity of the group, $Y_{ij}=$ estimated coefficient of prices, $\beta=$ estimated expenditure of the groups, $X =$ total expenditure and $P=$ price index of the group.

Equations (1) and (2) are the basic equations of AIDS model and represent a non-linear system of equations. Restriction from consumer demand theory is easily imposed on the model. These restrictions are necessary if the model is to be consistent with the basic axioms of demand and utility theory: the adding up restrictions requires that.

$$\Sigma_{i=1}^{n}\alpha_i = 1,\ \Sigma_{i=1}^{n}\gamma_{ij} = O,\ \Sigma_{+=1}^{n}\beta = 0 \quad \text{so that}$$

$W_i = 1$ for homogeneity $\qquad\qquad\qquad (3)$

$\Sigma_j \gamma\ s_{ij} = O$ and for symmetry requiring $\gamma_{ij} = \gamma_{ij}$ $\quad (4)$

Equation 1 is non-linear in its parameter because of equation (2). Deaton and Mullbauer (1980) argued that where prices are closely collinear, it may well be adequate to approximate P as proportional to some known index P*.A common approximation for P* is stone index.

Where $ln$P* $= \Sigma W_k ln P_k \qquad (5)$

With this simplification for the expression of P, the expenditure share in the i-th destination, Wij, is determined in the long run by:

$$w_i = \alpha_i + \sum_j \gamma_{ij} \ln\ p_j + \beta_i \ln\left(x/P^*\right) \qquad (6)$$

The AIDS model permits the derivation of the complete set of relevant elasticities, for example, the expenditure elasticities.

$\eta_i$will be given by $\eta_i = (\beta i/wi) +1 \qquad (7)$

Uncompensated own price elasticities

$\varepsilon_{ji}$as $\varepsilon_{ii} = (\gamma_{ii}/w_i) - \beta - 1 \qquad (8)$

Uncompensated cross price elasticities

$\varepsilon_{ji}$as $\varepsilon_{ii} = (\gamma_i/w_i) - \beta_i(w_j/w_i) \qquad (9)$

These supply crucial information about the interdependencies of competing products and also allow for formal tests of the validity of the assumption about consumer behavior with the sample set of observations.

## RESULTS AND DISCUSSION OF FINDINGS

**Socio-economic distribution of Respondents:** Table 1 revealed that 31.4 percent of the respondents fell within the age range of 41-50 years, while only 1.1 percent of respondents are less than or equal to 20 years. The mean age of 45 years implied that majority of the respondents are still in their active years in life. About 60 percent of the respondents were female, 83.1 percent of the respondents were married while just 7.9 percent of them were single. Majority (69.7percent) of the respondents had a household that is less than or equal to5 members, 3.4 percent had a household size of more than 8 members. The mean household size is 5 members which suggest that majority of the household in the study area do not have a large household size. The table also revealed that 6.7 percent of the respondents had no formal educational background while 42.7 percent of them have tertiary education. The average years of education is 12 which showed that an average respondent have a secondary education according to the national educational system in Nigeria. This is an indication that most of the respondents were educated and will be aware of the food value and importance of Non-timber forest product to human existence. Primary occupation of the respondents further revealed that 37.1 percent of the respondents were Civil Servants while only about 10percent were farmers, however, 47.2 percent of them had no secondary occupation. On the NTFPs consumption, the findings showed that 25.8 percent of the respondents have been consuming NTFPs product for about 10years, while only 13.5 percent claim to have been consuming NTFPs for over 30 years. This implies that majority of the respondents have been consuming NTFP for a long period. Result on proximity to availability of NTFPs products revealed that87.6 percent of the respondents which lives within less than 5km distance to where NTFPs can be accessed.

### Uses of NTFPs

NTFPS are tagged important delicacy or items that are normally used during ceremonial activities depending on the cultural belief in various part of Nigeria. The various uses to which the respondents claim to put NTFPs is presented in Table 2. The result revealed that 93.3 percent of the respondents consume bush-meat, a super delicacy sourced from wild animals (games) such as antelope, squirrel, bush rat e.t.c as food , however only about 7 percent claim to use it for ceremonial activity because of its high cost. Close to this is the use of snail for consumption purposes(96.6%) although only 1 percent of them claim to use it for medicinal purposes. For ceremonial purposes, 2.2 percent, 11.1 percent and 15.7 percent of the respondents claimed to use garden eggs, moinmoin leaves and kolanut respectively. About 29 percent of

them indicated that they use kolanut for medicinal purposes. This implies that NTFPS are used for different usefulness to the respondents in the study area.

## Challenges encountered during collection of NTFPs

Various problems encountered during collection of non-timber forest products are presented in Table 3.

### Table 1. Socio-economic Distribution of Respondents

| Socio-economic | Frequency | Percentage | mean±standard deviation |
|---|---|---|---|
| **Age** | | | |
| ≤ 20 | 1 | | 1.1 45.39±12.57 |
| 21-30 | 14 | 15.8 | |
| 31-40 | 17 | 19.1 | |
| 41-50 | 28 | 31.4 | |
| 51-60 | 19 | 21.4 | |
| Above 60 | 10 | 11.2 | |
| **Sex** | | | |
| Male | 36 | 40.4 | |
| Female | 53 | 59.6 | |
| **Marital status** | | | |
| Married | 74 | 83.1 | |
| Single | 7 | 7.9 | |
| Widowed | 6 | 6.8 | |
| Divorced/Separated | 2 | 2.2 | |
| **Household size** | | | |
| 1-5 | 62 | 69.7 | 5.09±1.76 |
| 6-8 | 24 | 26.9 | |
| 9-10 | 3 | 3.4 | |
| **Education(yrs)** | | | |
| 0 | 6 | 6.7 | 12.97±5.72 |
| 1-6 | 5 | 5.7 | |
| 7-12 | 30 | 33.7 | |
| 13-18 | 38 | 42.7 | |
| Above 18 | 10 | 11.12 | |
| **Pry. Occupation** | | | |
| Civil Servant | 33 | 37.1 | |
| Teaching | 15 | 16.9 | |
| Farming | 9 | 10.1 | |
| Trading | 17 | 19.1 | |
| Student | 7 | 7.9 | |
| Private firm | 8 | 9.0 | |
| **Secondary Occupation** | | | |
| Trading | 21 | 23.6 | |
| Farming | 10 | 11.2 | |
| None/Nil | 42 | 47.2 | |
| Any other occupation | 14 | 15.7 | |
| No response | 2 | 2.2 | |
| **Length of consumption** | | | |
| <10 | 23 | 25.8 | |
| 11-20 | 34 | 38.2 | |
| 21-30 | 20 | 22.5 | |
| >31 | 12 | 13.5 | |
| **Proximity to NTFPs (km)** | | | |
| 0-5 | 78 | 87.6 | |
| 6-10 | 6 | 6.8 | |
| 11-15 | 4 | 4.5 | |
| 16-20 | 1 | 1.1 | |
| **Total** | **89** | **100.0** | |

Source: Field Survey, 2015.

### Table 2. Frequency Distribution of the Respondents According to NTFPs item uses

| NTFPs | Use | Frequency | percentage |
|---|---|---|---|
| Bush meat | Ceremony | 6 | 6.7 |
| Household | Consumption | 83 | 93.3 |
| Snail | Ceremony | 2 | 2.2 |
| Household | Consumption | 86 | 96.6 |
| | Medicinal | 1 | 1.1 |
| Garden egg | Ceremony | 10 | 11.2 |
| Household | consumption | 79 | 88.8 |
| Moinmoin- leaves | Ceremony | 3 | 3.4 |
| | Consumption | 86 | 96.6 |
| Kolanut | Ceremony | 14 | 15.7 |
| | Consumption | 49 | 55.1 |
| | Medicinal | 26 | 29.2 |

Source: Field Survey, 2015.

The result revealed that 51.7 percent of the respondents were affected with change in price of selected NTFPs (i.e. fluctuation in price) which maybe due to product inadequacy. About 46 percent of the respondents claimed that NTFPs collection problems may arise from inadequate factors of production which may not be easily available i.e. land, labour and capital may be a problem to NTFPs providers, Other respondents claimed they encountered scarcity of NTFPs items which may be due to seasonality issues. While 40.4 percent of them experienced problem with transportation of the products from place of collection or purchase to destinations where they are needed. Only 19.1 percent of the respondents considered distance as a challenge to them for NTFPs collections. This implies that the listed problems above may affect the adequacy or availability of NTFPs hence, the consumption and purchase of these items. The table further revealed a list of suggested solutions proffered by the respondents.

About 48 percent claimed easy accessibility to land will reduces the challenges, this may be used to convince the youth and unemployed people to have interest in farm activities.

While 42.7 percent of them support the provision of farm tools and implements to farmers by the government at a subsidized rate i.e. to encourage farming activities, 42percent perceived that availability of loan to farmers will improve NTFPs yield in terms of productivity. About 39 percent of the respondents perceive solution to NTFP problem is through provision of educative seminar and training to farmers to broaden their knowledge on NTFP food items. On the other hand, 34.8 percent of the respondents perceive discouraging deforestation will improve planting of NTFPs items, while 32.6 percent of them perceive that avoidance of bush burning which destroy the ecological system of a cultivated land will help to improve availability.

**Table 3. NTFPs collection Problem and perceived solution**

| Problems and solution | Frequency * | Percentage |
|---|---|---|
| **Problem Encountered** | | |
| Price changes | 46 | 51.7 |
| Unavailability of factors of production | 41 | 46.1 |
| Scarcity of items | 40 | 44.9 |
| Transportation | 36 | 40.4 |
| Storage facilities | 34 | 38.2 |
| Seasonal Fluctuation | 32 | 36.0 |
| Bad road | 30 | 33.7 |
| Expensive | 25 | 28.1 |
| Distance | 17 | 19.1 |
| | | |
| **Possible measures** | | |
| Provision of Land | 43 | 48.3 |
| Given Farm tools and implements at subsidized rate | 38 | 42.7 |
| Loans | 37 | 41.6 |
| Training and Seminar | 35 | 39.3 |
| Discourage deforestation | 31 | 34.8 |
| Avoid Bush Burning | 29 | 32.6 |

*Multiple choice Source: Field Survey, 2015

**Table 4. The Unconstrained Parameter Estimates and Test of Homogeneity**

| Commodity | Constant | Bushmeat | Snail | Moinmoin leave | Garden egg | Kola | Expenditure | $R^2$ | DW |
|---|---|---|---|---|---|---|---|---|---|
| Bushmeat | 0.549*** | 0.077*** | -0.031*** | -.004*** | 0.001 | -0.002 | -0.083*** | 0.98 | 2.27 |
| | (27.623) | (15.933) | (-6.423) | (-2.700) | (0.606) | (-1.247) | (-30.068) | | |
| Snail | 0.498*** | 0.008 | 0.51*** | 0.001 | -0.002 | 0.001 | -0.100*** | 0.99 | 1.97 |
| | (21.704) | (1.090) | (9.089) | (0.068) | (-0.926) | (0.327) | (-26.696) | | |
| Moinmoin leave | 0.123*** | 0.007 | 0.04 | 0.024*** | 0.001 | -0.001 | -0.34*** | 0.87 | 1.85 |
| | (6.421) | (1.592) | (1.168) | (13.637) | (0.545) | (-0.883) | (-5.219) | | |
| Garden egg | 0.110*** | 0.006 | 0.004 | 0.003* | 0.017** | -0.001 | -0.030*** | 0.79 | 1.95 |
| | (5.999) | (1.492) | (1.427) | (1.826) | (12.187) | (-0.952) | (-4.680) | | |
| Kola | 0.055*** | 0.003 | 0.001 | 0.001 | -0.001 | 0.013** | -0.014*** | 0.80 | 1.88 |
| | (4.475) | (1.002) | (0.558) | (0.228) | (-1.487) | (12.116) | (-3.128) | | |

Source: Field Survey 2015
Values in parenthesis represent t-values
*** significant at 1% level, ** significant at 5% level and * significant at 10% level.

**Table 5. Distribution by Own price and Cross price Elasticities**

| Commodity | Bushmeat | Snail | Moinmoin leave | Garden egg | Kola |
|---|---|---|---|---|---|
| Bushmeat | -0.771 | 0.121 | -0.002 | -0.006 | -0.001 |
| Snail | 0.033 | -0.772 | 0.088 | 0.001 | 0.007 |
| Moinmoin leave | 0.734 | 0.515 | -0.260 | 0.053 | -0.012 |
| Garden egg | 0.910 | 0.663 | 0.168 | -0.262 | -0.021 |
| Kola | 32.352 | 0.345 | 0.087 | -0.039 | -0.221 |

Source: Field survey, 2015

**Test of homogeneity of selected NTFPs**

We have five equations in all; bush meat is the first equation and using its budget share as the dependent variable. The result reveals that four of the variables namely bushmeat, snail, moinmoin-leave and its expenditure are significant at 1 percent. There is an inverse relationship between household expenditure on food and budget share on bushmeat and this implies that as the household expenditure rises the budget share of the bushmeat falls by 0.083.Only the price of bushmeat has a direct relationship with its budget share which means that an increase in the price of bushmeat will lead to increase in its budget share by 0.077 while increase in the price of snail and moinmoin-leave will lead to decrease in the budget share by 0.031 and 0.004 respectively.

**Table 6. Distribution by Elasticities of Food Consumption**

| Commodity | Mean budget share % | Expenditure Elasticity |
|---|---|---|
| Bushmeat | 52.8 | 0.843 |
| Snail | 39.7 | 0.748 |
| Moinmoin leave | 3.4 | 0.001 |
| Garden Egg | 2.4 | -0.250 |
| Kola | 1.7 | 0.176 |

Source: Field Survey, 2015

The snail budget share reveals that only two variables were significant i.e. price of snail and its expenditure at one percent significant level. This reveals that there is an increase in the price of snails which will increase its budget share by 0.51 percent while an increase in snail expenditure will reduce the budget share of snail by 0.1. Also, the result for moinmoin-leave showed that, only two of the variables were significant. The price of moinmoin-leave and total food expenditure were also significant in the third equation at one percent level. There is direct and inverse relationship between price of moinmoin leave and food expenditure to its budget share respectively. The price of moinmoin-leave, garden egg, and total food expenditure are the significant variables in the fourth equation. Here, there is a direct relationship between moinmoin-leave and price of garden egg and its budget share while an inverse relationship occur between garden eggs total food expenditure to its budget share which shows that a unit increase in price of garden egg and moinmoin-leave will give rise to 0.017 and 0.003 increase in budget share respectively. In the last equation (kolanut), only two variables were significant, i.e. price of kola and total food expenditure at one percent level. It further explains that an increase in the total food expenditure will results to 0.014 percent fall in their budget share to kola while increase in the price of kolanut will increase its budget share by 0.013.

**Own price and Cross Elasticities**

In all the five products used, owned price elasticities are less than unity in their absolute terms. This implies that their demand is inelastic. Own price for snail (0.772) and bush meat (0.771) are relatively more elastic than other NTFPs items. The least in this category however is the price of kolanut (0.221) which is the most inelastic own price among other NTFPs items considered in the study area. This illustrate that households in Akure metropolis are not sensitive to the

changes in the price of kolanut.That is, reduction in the price of kolanut or increase in household income will not have much effect on its consumption which suggests that consumption of kolanut falls with increase in its price. Considering the cross price elasticity, positive and negative signs indicate substitutability and complementarity among the products respectively. The cross price elasticities are lower than unity, however an increase in the price of moinmoin-leave will decrease consumption of kolanut by 0.021.On the other hand, an increase in price of moinmoin-leave will increase demand for snail by 0.515.

**Elasticities for Food Consumption**

The expenditure elasticity for the NTFPs as shown in Table 6. The selected NTFPsconsideredare all positive except garden egg and according to demand theory, positive expenditure (income) elasticity indicates that a commodity is a normal good while a negative sign showed that it is an inferior good. Also, income elasticity that is greater than unity characterise a luxury good where budget will increase with an increase in household income. The necessity goods have its elasticity between zero and one indicating a fall in budget share with increase in household income. Based on this study, the result reveals that the elasticities were less than one in absolute terms implying that an increase in real expenditure would lead to a proportionate decrease in demand for this NTFPs. Ranking the elasticity in order of preference shows that bush-meat is the most preferred (0.8), closely followed by snail (0.7), the least preferred however, among the ranking is moinmoin-leave (0.001).

**Conclusion**

The estimate of own price elasticity which is related to law of demand has negative sign that indicate complementary relationship among NTFPs respectively. In absolute terms, own price is less than one therefore all NTFPs considered are inelastic in demand. Other estimated value for cross price elasticities are positive and negative which gives an indication of substitution and complementary effect in demand for NTFPs considered. Expenditure elasticity values are positive which reveals that NTFPs items considered are normal goods.

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