

**CONSTRAINTS TO NON-TIMBER FOREST PRODUCTS SUPPLY IN AGO-OWU  
FOREST RESERVE OF OSUN STATE**

**Abstract**

Non-Timber Forest Products (NTFPs) are products or services other than timber that is produced in a forest and of course, are indispensable parts of the livelihood strategy of the forest's adjoining communities. Its economic potentials necessitated the need for research to be carried out on its production and constraints facing its supply in the study area. Therefore, constraints to NTFPs' supply in Ago-Owu forest reserve and its environment were investigated. Three communities (Mokore, Ajegunle and Alabameta) were randomly selected out of the six (Mokore, Ajegunle, Alabameta, Elewe, Alaguntan and Okodowo) identified communities in the study area. Their populations were sought for and samples were drawn in proportionate to their sizes: Mokore (50), Ajegunle (40) and Alabameta (20) to give a total number of 110 respondents and 105 questionnaires were retrieved. A set of questionnaire was used to obtain data on source of NTFPs, commonly sourced NTFPs and constraints facing its supply in the study area. Data were analyzed using descriptive statistics and logit regression at  $\alpha_{0.05}$ . Majority of the respondents were male (69.1%) and 64.8% of them were within the age of 30-50 years. Also, most of the respondents were married (78.1%) and less than half of them (41%) had no formal education, but were predominantly farmers (72.4%). The major source of NTFPs in the study area was forest reserve (70.5%), while a total of seventeen (17) different NTFPs commonly sourced were documented. Constraints facing the supply of NTFPs included Climate change, Lack of finance for smooth running of the activities involved in the products' supply and price fluctuation with odds-ratio of 9.87, 5.66 and 1.92 respectively. The study established the significance of the Ago-Owu forest reserve to the livelihood of the forest dwellers. However, there is need for the establishment of new plantations to fostering production of the products as well as serving as adaptation strategies against climate change. There is also an urgent need for the State Forestry Service/government to address their areas of concern pointed out in this study for bio-

31 prospecting, economic well-being of forest dwellers and great advantage of boost in revenue  
32 propensity of Osun State.

33 **Keyword:** NTFPs, Source, Constraints, Forest dwellers

34

### 35 **Introduction**

36 Non-Timber Forest Products (NTFPs) are biological products and services derived mainly from  
37 forests as well as marginal lands. Over the years, forest and its products have contributed  
38 immensely to the economic development of Nigeria (Fonta *et al.* 2010). Forest products can be  
39 classified into two: Timber, which constitutes the bulk of forest-based materials used for  
40 economic purposes, and Non-timber forest products. During the 1960s and 1970s, forest  
41 products earned large amounts of foreign exchange and the sector was ranked highest in  
42 employment generation. The forest sector earned annual foreign exchange of between 308  
43 million to 412 million naira or about 4.2 percent of GDP (World Bank, 1988). The situation,  
44 however, turned around between 1970 and 1985, due to the discovery of oil.

45 NTFPs have been studied by researchers from many different academic fields and each field  
46 used a slightly different definitions. NTFPs include any product or service other than timber that  
47 is produced in a forest (CIFOR, 2004). They include fruits, nuts, vegetables, fish medicinal  
48 plants, resins, essences, a range of barks and fibers, bamboo, rattans, honey, insects, animals,  
49 fodder, fertilizers, medicinal extracts, construction materials, cosmetic and cultural products,  
50 natural dyes, tannin, gums, latex and other exudates, essential oils, spices, edible oils, decorative  
51 articles, horns, tusks, bones, pelts, plumes, hides and skins, non-wood ligno-cellulosic products,  
52 phytochemicals and aroma chemicals.

53 NTFPs are indispensable part of the livelihood strategy of communities living in and near  
54 forests. They constitute an important source of livelihood for millions of people across the globe.  
55 The term non-timber forest product preferably called Non-Wood Forest Products in some regions  
56 of the world has been used (of recent) to replace minor forest products as it was formerly  
57 particularized. The regional expert consultation on NWFPs for Africa held in Arusha Tanzania ,  
58 defined NTFPs as all vegetal and fauna products (other than wood) derived from forests,  
59 excluding industrial round wood, wood used for energy, horticultural and livestock  
60 products(FAO, 1995). Rijsoort (2010) defined NTFPs as all tropical forest products plants and  
61 animals or parts thereof other than industrial timber, which are (or can be) harvested for human

62 use at the level of self-support or for commercial purposes. The use of NTFPs is as old as human  
63 existence.

64 The role of NTFPs in the daily life and welfare of people all over the world cannot be over-  
65 emphasized. Different parts of a plant or animal often provide different products simultaneously  
66 and or at different times. About 80% of the population of the developing world depends on  
67 NTFPs for their primary health and nutritional needs (FAO, 1995). Rural women were found to  
68 be making between ₦115 and ₦500 in fruit gathering and sale of NTFPs. It is therefore  
69 paradoxical that in spite of their real and potential value, most NTFPs remain grouped as minor  
70 forest products. These products rarely feature in statistics and are hardly studied or researched.  
71 Forest management in Nigeria has been largely focused on timber production ever since the  
72 beginning of organized forestry. However, in the recent time, there has been increasing  
73 recognition of the fact that this approach to forest management is neither conducive to  
74 sustainable management of the forests particularly of the tropical moist forest nor is it in the best  
75 economic interest of the predominantly rural societies in the tropics. Due to the relative scarcity  
76 of most of the NTFPs as a result of deforestation and the present awareness of their importance,  
77 more value is being added which has made the NTFPs highly marketable.

78 Research at a global scale has identified that rural households draw from a diversity of income  
79 sources, adopt a range of livelihood strategies in order to achieve and maintain a sustainable  
80 livelihood. These include the use of NTFPs both for household consumption and for sale.

81 In view of the above, this paper revealed the major source and commonly sourced NTFPs viz-a-  
82 viz the constraints facing its supply in Ago-Owu forest reserve and its environs, with a view to  
83 suggesting mitigations in the study area.

84

85

## 86 **Methodology**

### 87 **Area of study**

88 The study was carried out in Ago-Owu forest reserve. It is located between the latitude  
89  $7^{\circ}9'37.8144''N - 7^{\circ}14'0.8376''N$  and longitude  $4^{\circ}4'22.728E - 4^{\circ}10'6.3264''E$ . Ago-Owu  
90 forest reserve is in thick forest zone and it consists of 32,116 hectares in the high forest area.  
91 There is existence of forest adjoining communities in and around the reserve. These included

92 Mokore, Ajegunle, Alabameta, Elewe, Alaguntan and Okodowo, in which majority of the  
93 dwellers are farmers.

#### 94 **Data Collection and Analysis**

95 Three communities (Mokore, Ajegunle and Alabameta) were randomly selected out of the six  
96 (Mokore, Ajegunle, Alabameta, Elewe, Alaguntan and Okodowo) identified communities in the  
97 study area with the projected populations of 998, 201 and 801 respectively (NPC, 2006).

98 Diaw *et al.* (2002) was adopted for the study. Hence, 10% sampling intensity was used to  
99 sample respondents in the communities where the population is less than 500, 5% for population  
100 between 500 and 1000 and 2.5% for population over 1000.

101 Therefore, 50 respondents were reached in Mokore, 40 in Ajegunle and 20 in Alabameta.  
102 Therefore a total of 110 questionnaires were administered while only 105 were retrieved from  
103 the field which represents 95.45% returns. Data collected were subjected to descriptive statistics  
104 and Logit regression analysis.

#### 105 **Result and Discussion**

106 **Table 1: Socio-Economic Characteristics of the Respondents in the Study Area**

Socio-economic characteristics	Frequency	Percentage
<b>Gender</b>		
Male	65	61.9
Female	40	38.1
<b>Total</b>	<b>105</b>	<b>100</b>
<b>Age</b>		
20-30 years	21	20
30-41 years	45	42.9
41-50 years	23	21.9
Above 50 years	16	15.2
<b>Total</b>	<b>105</b>	<b>100</b>
<b>Marital status</b>		
Single	12	11.4

Married	82	78.1
Widows	11	10.5
<b>Total</b>	<b>105</b>	<b>100</b>
<b>Educational status</b>		
No formal education	41	39
Secondary education	23	21.9
Primary education	38	36.2
Adult education	3	2.9
<b>Total</b>	<b>105</b>	<b>100</b>
<b>Occupation</b>		
Trading	29	27.6
Farming	76	72.4
<b>Total</b>	<b>105</b>	<b>100</b>

107 **Source: Field Survey, 2019**

108

109 **Socio-Economic Characteristics of the Respondents**

110 Table 1 showed the socio-economic characteristics of the respondents in the study area. It was  
 111 revealed that 69.1% of the respondents were male while 38.1% were female. Forest reserve's  
 112 environment is notable for diverse economic activities and this may be the reason why the area is  
 113 dominated by male. Men strives hard to fend for their families and this may not be unconnected  
 114 to the fact that men are mainly household head and the major controller of household resources,  
 115 as confirmed by Edey and Mbam (2012). Hence, they tend to engage in diverse economic  
 116 activities than female so as to be in financial control of their family.

117 In terms of age distribution, majority of the respondents (42.9%) were within the ages of 30-41  
 118 years, followed by respondents within the ages 41-50 years (21.9%) while those within the ages  
 119 of 50 years and above recorded the least percentage (15.2%). It could be inferred that most of the  
 120 respondents were in their economical active age. This shows that majority of the respondents  
 121 were physically and economically active to engage in various production activities, including  
 122 collection of NTFPs. As a matter of fact, venturing to any economic activity requires  
 123 consideration of one's agility. This is in tandem with the work of Dolisca *et al.* (2006) and

124 Tazeze *et al.* (2012) who reported that age is significantly related to farmer’s decisions during  
125 adoption strategies.

126 Information on marital status of the respondents revealed that 78.21% of them were married,  
127 11.4% were single and 10.5% were widow. Since most of the respondents were married, it is  
128 expected that they should have more responsibilities than singles. This in turn has tendency of  
129 raising their level of commitment. This agrees with the finding of Akinbile (2007), who reported  
130 that marriage confers responsibility.

131 Data on educational status indicated that less than half of the population of the respondents  
132 (41%) had no formal education, while the substantial population had at least basic education  
133 (38.0% - primary, 23% - secondary and 3% - adult education). Proper education of the people  
134 living in forest’s adjoining communities is of sinequanon if sustainability of forest resources is to  
135 be achieved. This is in line with the report of Kajembe and Luoga (1996) who argued that  
136 increase in education tend to increase people’s awareness on the importance of natural resources  
137 conservation for sustainable production.

138 Finally, data gathered on the occupation of the respondents showed that they are predominantly  
139 farmers (72.4%). This implies that farming was the main economic activity in the study area.

140

141 **Table 2: Sources of NTFPs collected by the respondents**

Response	Frequency	Percentage
Reserve	74	70.5
Free areas	31	29.5
Total	105	100

142 **Source: Field Survey, 2019.**

#### 143 Sources of NTFPs

144 Table 2 showed that majority of the respondents (70.5%) sourced the products from the forest  
145 reserve while only 29.5% of them sourced theirs from the free areas. It could therefore be  
146 inferred that forest reserve is highly significant to the livelihood of the forest dwellers in the

147 study area and this agrees with the finding of Zugman (1995), who observed that people will use  
148 the forests to provide for their needs; how they use these forests positively or negatively will  
149 depend on economic development.

150

151 **Table 3: Commonly sourced NTFPs in the study area**

Common name	Frequency	Percentage %
Bamboo	7	6.7
Bush-meat	7	6.7
Charcoal	2	1.9
Fruit	8	7.6
Fuel wood	20	19.1
Honey	3	2.9
Locust bean	3	2.9
medicinal plant	8	7.6
Mushroom	5	4.8
Vegetable	5	4.8
wrapping leaf	5	4.8
Bark	7	6.7
Gum	3	2.9
Snail	7	6.7
Insect	4	3.8
Seed	3	2.9
Palm fruit	8	7.6
<b>Total</b>	<b>105</b>	<b>100</b>

152 **Source: Field Survey, 2019.**

153

### 154 **Commonly Sourced NTFPs**

155 Table 3 revealed the commonly sourced NTFPs in the study area. The study indicated that a total  
156 of seventeen (17) different NTFPs are commonly sourced from the study area. It was further  
157 observed that fuel wood had the majority percentage which accounted for 19.05%, followed by  
158 fruit (7.6%), medicinal plants (7.6%) and palm fruit (7.6%) while the least was charcoal with

159 1.90%. This agrees with the work of Lynch and Alcorn (1994); Kumar *et al.* (2009) who  
160 observed in their studies that many of NTFPs are being used by locals for the improvement of  
161 their livelihood status; these include leaves, flowers, fruits, branches, gum/resins, roots etc.

## 162 **Constraints Facing the Supply of NTFPs**

163 Logit regression model for constraints facing the supply of NTFPs in the study area

### 164 **The binary model**

165 Table 4 presents binary regression obtained for the constraint facing NTFPs in the study area.

$$166 \text{CFNTFPs} = 0.67 + 2.29\text{CCHA} + 1.73\text{LFIN} - 1.53\text{LDA} - 0.67\text{IPF} - 0.58\text{EFLA} - \\ 167 0.88\text{HCT} - 0.67\text{PRNE} - 0.67\text{ISF} - 0.65\text{PFL} \text{ ---- (Equation 1)}$$

168 N = 105, Final Loss = 34.86, Chi-Square (df, 9) = 19.90, P = 0.0185

169 Odd ratio (Unit Change): Constant (5.53); CCHA (9.87); LFIN (5.66); LDA (0.22); IPF (0.51);  
170 EFLA (0.56); HCT (0.42); PRNE (0.51); ISF (0.51); PFL (1.92)

171 Where,

172 CFNTPs =Constraints facing the supply of NTFPs (Dependent variable)

173 While independents variables includes:

174 CCHA =Climatic Change

175 LFIN =Lack of Finance

176 LDA =Low Demand

177 IPF =Inadequate Processing Facilities

178 EFLA =Enforcement of Forest Law

179 HCT =High Cost of Transportation

180 PRNE =Poor Road Network

181 ISF =Inadequate Storage Facilities

182 PFL =Price Fluctuation

183

184 **Table 4: Logit Binary of Constraints Facing the Supply of NTFPs in the Study Area**



185 Dependable Variable (CFNTFPs) = Constraints Facing NTFPS (Yes = 1. No = 0)

Independent Variables	Coefficient	Odds Ratio
Whether presence of (CCHA) is responsible for inadequate supply of NTFPs	2.29	9.87*
Whether presence of (LFIN) is responsible for inadequate supply of NTFPs	1.73	5.66*
Whether presence of (LDA) is responsible for inadequate supply of NTFPs	-1.53	0.22
Whether presence of (IPF) is responsible for inadequate supply of NTFPs	-0.67	0.51
Whether presence of (EFLA) is responsible for inadequate supply of NTFPs	-0.58	0.56
Whether presence of (HCT) is responsible for inadequate supply of NTFPs	-0.88	0.42
Whether presence of (PRNE) is responsible for inadequate supply of NTFPs	-0.67	0.51
Whether presence of (ISF) is responsible for inadequate supply of NTFPs	-0.67	0.51
Whether presence of (PFL) is responsible for inadequate supply of NTFPs	0.65	1.92*
<b>Model <math>\chi^2</math> (df, 9) = 19.90; Final Loss = 34.86; P&lt;0.05</b>		

186 \*Significant at p<0.05; ns = Not Significant

187 Model presented above for Ago-Owu Forest Reserve and its environs gave overall significant fit  
 188 to the data judging from  $\chi^2$  value that was significant at p<0.05. Climate Change (CCHA) had the  
 189 highest odd-ratio of 9.87, followed by Lack of Finance (LFIN) with the odd-ratio of 5.66 and  
 190 Price Fluctuation (PFL) with the odd-ratio of 1.92 respectively.

191 Therefore, the factors identified to be responsible for inadequate supply of NTFPs in the study  
 192 area were climate change (CCHA), Lack of finance (LFIN) for smooth running of the various  
 193 activities involved in the products supply and Price fluctuation (PFL). There was sufficient  
 194 evidence that the estimated coefficients for the factors were not zero. This implies that the  
 195 regression parameters in the model were statistically significant. In other words, the higher the

196 value of odds-ratio the more likelihood these factors responsible for inadequate supply of NTFPs  
197 in the study area. Hence, it clearly indicated the variable(s) i.e factors that mostly influence the  
198 supply of NTFPs in the study area. The implication was corroborated by Deeks (1996); Bland  
199 and Altman (2000) that the logit model provides information on the consequences of one  
200 variable on the other. Therefore, existence of these factors poses serious challenges to adequate  
201 supply of NTFPs in the study area.

## 202 **Conclusion and Recommendations**

203 The study established the fact that Ago-Owu forest reserve is highly significant to the livelihood  
204 of people living in and around the reserve, since most of the NTFPs collected are sourced from  
205 there. The study also revealed the huge potentials of the reserve in terms of diverse NTFPs  
206 production which are notable for high economic value. Constraints facing the supply of NTFPs  
207 in the study area were climate change, lack of finance for the smooth running of the various  
208 activities involved in the products' supply and price fluctuation.

209 Therefore, it is suggested that establishment of privately and community-owned plantations  
210 stocked with both the exotic and indigenous tree species should be encouraged by the Osun  
211 forestry service in the study area so as to enhancing the production of NTFPs to the social,  
212 environmental and economic benefit of the community dwellers and even beyond. Since some of  
213 the implications of climate change effects are reduction in yield, undefined season, pest and  
214 disease outbreak etc., afforestation should be adopted by forest dependent farmers in the study  
215 area as an adaptation measure against climate change. It may even be in form of Agro-forestry  
216 since it has a particular role to play in mitigation of atmospheric accumulation of greenhouse  
217 gases, because it has potential for carbon sequestration, improve soil nutrient uptake, water  
218 percolation, aeration, water recharge and soil water balance. For the smooth running of the  
219 various activities involved in the products' supply, government of Osun State should try as much  
220 as possible to empower the forest dwellers by giving them some financial incentives (Credit  
221 facilities) to enhancing the supply of the products. It is understandable that price fluctuation may  
222 be seasonal dependent, but nevertheless NTFPs' collectors should always try to fix reasonable  
223 prices so as to ease the evacuation and supply of the products to the end users.

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