

**CONSTRAINTS TO NON-TIMBER FOREST PRODUCTS SUPPLY AT 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-prospecting, economic well-being of forest dwellers and great advantage of boost in revenue propensity of Osun State.

Keywords: NTFPs, Source, Constraints, Forest dwellers

INTRODUCTION

Non-Timber Forest Products (NTFPs) are biological products and services derived mainly from forests as well as marginal lands. Over the years, forest and its products have contributed immensely to the economic development of Nigeria (Fonta *et al.* 2010). Forest products can be classified into two: Timber,

35 which constitutes the bulk of forest-based materials used for economic purposes, and Non-timber forest
36 products. During the 1960s and 1970s, forest products earned large amounts of foreign exchange and the
37 sector was ranked highest in employment generation. The forest sector earned annual foreign exchange of
38 between 308 million to 412 million naira or about 4.2 percent of GDP (World Bank, 1988). The situation,
39 however, turned around between 1970 and 1985, due to the discovery of oil.

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

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

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

68 of the NTFPs as a result of deforestation and the present awareness of their importance, more value is
69 being added which has made the NTFPs highly marketable.

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

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

76 **METHODOLOGY**

77 **Area of study**

78 The study was carried out in Ago-Owu forest reserve. It is located between the latitude $7^{\circ}9'37.8144''N$
79 – $7^{\circ}14'0.8376''N$ and longitude $4^{\circ}4'22.728E$ – $4^{\circ}10'6.3264''E$. Ago-Owu forest reserve is in thick
80 forest zone and it consists of 32,116 hectares in the high forest area. **There is forest adjoining**
81 communities in and around the reserve. These included Mokore, Ajegunle, Alabameta, Elewe, Alaguntan
82 and Okodowo, in which majority of the dwellers are farmers.

83 **DATA COLLECTION AND ANALYSIS**

84 Three communities (Mokore, Ajegunle and Alabameta) were randomly selected out of the six (Mokore,
85 Ajegunle, Alabameta, Elewe, Alaguntan and Okodowo) identified communities in the study area with the
86 projected populations of 998, 201 and 801 respectively (NPC, 2006). Diaw *et al.* (2002) was adopted for
87 the study. Hence, 10% sampling intensity was used to sample respondents in the communities where the
88 population is less than 500, 5% for population between 500 and 1000 and 2.5% for population over 1000.
89 Therefore, 50 respondents were reached in Mokore, 40 in Ajegunle and 20 in Alabameta. Therefore a
90 total of 110 questionnaires were administered while only 105 were retrieved from the field which
91 represents 95.45% returns. Data collected were subjected to descriptive statistics and Logit regression
92 analysis.

93 **RESULTS AND DISCUSSION**

94 **TABLE 1 Socio-Economic Characteristics of the Respondents in the Study Area**

Socio-economic characteristics	Frequency	Percentage
Gender		
Male	65	61.9
Female	40	38.1
Total	105	100

Age		
20-30 years	21	20
30-41 years	45	42.9
41-50 years	23	21.9
Above 50 years	16	15.2
Total	105	100
Marital status		
Single	12	11.4
Married	82	78.1
Widows	11	10.5
Total	105	100
Educational status		
No formal education	41	39
Secondary education	23	21.9
Primary education	38	36.2
Adult education	3	2.9
Total	105	100
Occupation		
Trading	29	27.6
Farming	76	72.4
Total	105	100

95 *Source: Field Survey, 2019*

96

97 **SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS**

98 **Table 1 shows** the socio-economic characteristics of the respondents in the study area. It was revealed that
 99 69.1% of the respondents were male while 38.1% were female. Forest reserve's environment is notable
 100 for diverse economic activities and this may be the reason why the area is dominated by male. Men
 101 strives hard to fend for their families and this may not be unconnected to the fact that men are mainly
 102 household head and the major controller of household resources, as confirmed by Edey and Mbam
 103 (2012). Hence, they tend to engage in diverse economic activities than female so as to be in financial
 104 control of their family.

105 In terms of age distribution, majority of the respondents (42.9%) were within the ages of 30-41 years,
 106 followed by respondents within the ages 41-50 years (21.9%) while those within the ages of 50 years and

107 above recorded the least percentage (15.2%). It could be inferred that most of the respondents were in
 108 their economical active age. This shows that majority of the respondents were physically and
 109 economically active to engage in various production activities, including collection of NTFPs. As a matter
 110 of fact, venturing to any economic activity requires consideration of one's agility. This is in tandem with
 111 the work of Dolisca *et al.* (2006) and Tazeze *et al.* (2012) who reported that age is significantly related to
 112 farmer's decisions during adoption strategies.

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

118 Data on educational status indicated that less than half of the population of the respondents (41%) had
 119 no formal education, while the substantial population had at least basic education (38.0% - primary, 23%
 120 - secondary and 3% - adult education). Proper education of the people living in forest's adjoining
 121 communities is of sinequanon if sustainability of forest resources is to be achieved. This is in line with
 122 the report of Kajembe and Luoga (1996) who argued that increase in education tend to increase people's
 123 awareness on the importance of natural resources conservation for sustainable production. Finally, data
 124 gathered on the occupation of the respondents showed that they are predominantly farmers (72.4%). This
 125 implies that farming was the main economic activity in the study area.

126 **TABLE 2 Sources of NTFPs collected by the respondents**

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

127 Source: Field Survey, 2019

128 **SOURCES OF NTFPS**

129 Table 2 showed that majority of the respondents (70.5%) sourced the products from the forest reserve
 130 while only 29.5% of them sourced theirs from the free areas. It could therefore be inferred that forest
 131 reserve is highly significant to the livelihood of the forest dwellers in the study area and this agrees with

132 the finding of Zugman (1995), who observed that people will use the forests to provide for their needs;
 133 how they use these forests positively or negatively will depend on economic development.

134 **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
Total	105	100

135 Source: Field Survey, 2019.

136 **Commonly Sourced NTFPs**

137 Table 3 revealed the commonly sourced NTFPs in the study area. The study indicated that a total of
 138 seventeen (17) different NTFPs are commonly sourced from the study area. It was further observed that
 139 fuel wood had the majority percentage which accounted for 19.05%, followed by fruit (7.6%), medicinal
 140 plants (7.6%) and palm fruit (7.6%) while the least was charcoal with 1.90%. This agrees with the work
 141 of Lynch and Alcorn (1994); Kumar *et al.* (2009) who observed in their studies that many of NTFPs are
 142 being used by locals for the improvement of their livelihood status; these include leaves, flowers, fruits,
 143 branches, gum/resins, roots etc.

144 **Constraints Facing the Supply of NTFPs**

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

146 **The binary model**

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

148 $CFNTFPs =$

149 $0.67 + 2.29CCHA + 1.73LFIN - 1.53LDA - 0.67IPF - 0.58EFLA -$
 150 $0.88HCT - 0.67PRNE - 0.67ISF - 0.65PFL$ ---- (Equation 1)

151 $N = 105$, Final Loss = 34.86, Chi-Square (df, 9) = 19.90, $P = 0.0185$

152 Odd ratio (Unit Change): Constant (5.53); CCHA (9.87); LFIN (5.66); LDA (0.22); IPF (0.51); EFLA
 153 (0.56); HCT (0.42); PRNE (0.51); ISF (0.51); PFL (1.92)

154 Where,

155 CFNTFPs =Constraints facing the supply of NTFPs (Dependent variable)

156 While independents variables includes:

157 CCHA =Climatic Change

158 LFIN =Lack of Finance

159 LDA =Low Demand

160 IPF =Inadequate Processing Facilities

161 EFLA =Enforcement of Forest Law

162 HCT =High Cost of Transportation

163 PRNE =Poor Road Network

164 ISF =Inadequate Storage Facilities

165 PFL =Price Fluctuation

166

167 **TABLE 4 Logit Binary of Constraints Facing the Supply of NTFPs in the Study Area**

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

Independent Variables	Coefficient	Odd 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	-1.53	0.22

supply of NTFPs		
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*

Model χ^2 (df, 9) = 19.90; Final Loss = 34.86; P<0.05

169 *Significant at p<0.05; ns = Not Significant

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

174 Therefore, the factors identified to be responsible for inadequate supply of NTFPs in the study area were
 175 climate change (CCHA), Lack of finance (LFIN) for smooth running of the various activities involved in
 176 the products supply and Price fluctuation (PFL). There was sufficient evidence that the estimated
 177 coefficients for the factors were not zero. This implies that the regression parameters in the model were
 178 statistically significant. In other words, the higher the value of odds-ratio the more likelihood these factors
 179 responsible for inadequate supply of NTFPs in the study area. Hence, it clearly indicated the variable(s)
 180 i.e factors that mostly influence the supply of NTFPs in the study area. The implication was corroborated
 181 by Deeks (1996); Bland and Altman (2000) that the logit model provides information on the
 182 consequences of one variable on the other. Therefore, existence of these factors poses serious challenges
 183 to adequate supply of NTFPs in the study area.

184 **CONCLUSIONS AND RECOMMENDATIONS**

185 The study established the fact that Ago-Owu forest reserve is highly significant to the livelihood of people
 186 living in and around the reserve, since most of the NTFPs collected are sourced from there. The study also
 187 revealed the huge potentials of the reserve in terms of diverse NTFPs production which are notable for
 188 high economic value. Constraints facing the supply of NTFPs in the study area were climate change, lack
 189 of finance for the smooth running of the various activities involved in the products' supply and price
 190 fluctuation. Therefore, it is suggested that establishment of privately and community-owned plantations

191 stocked with both the exotic and indigenous tree species should be encouraged by the Osun forestry
192 service in the study area so as to enhancing the production of NTFPs to the social, environmental and
193 economic benefit of the community dwellers and even beyond. Since some of the implications of climate
194 change effects are reduction in yield, undefined season, pest and disease outbreak etc., afforestation
195 should be adopted by forest dependent farmers in the study area as an adaptation measure against climate
196 change. It may even be in form of Agro-forestry since it has a particular role to play in mitigation of
197 atmospheric accumulation of greenhouse gases, because it has potential for carbon sequestration, improve
198 soil nutrient uptake, water percolation, aeration, water recharge and soil water balance. For the smooth
199 running of the various activities involved in the products' supply, government of Osun State should try as
200 much as possible to empower the forest dwellers by giving them some financial incentives (Credit
201 facilities) to enhancing the supply of the products. It is understandable that price fluctuation may be
202 seasonal dependent, but nevertheless NTFPs' collectors should always try to fix reasonable prices so as to
203 ease the evacuation and supply of the products to the end users.

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