Journal of Economics and Development Studies
September 2014, Vol. 2, No. 3, pp. 167-176
ISSN: 2334-2382 (Print), 2334-2390 (Online)

Published by American Research Institute for Policy Development
DOI: 10.15640/jeds.v2n3a12
URL: http://dx.doi.org/10.15640/jeds.v2n3a12

# Socioeconomic Impacts of Sawmill Industry on Residents. A Case Study of Ile-Ife, Nigeria

**Olawuni, Peter Olabiyi[1] & Okunola, Olasunkanmi Habeeb[1]**

**Abstract**

The study examined the socioeconomic impacts of sawmill industry on residents in Ile-Ife, Nigeria. Questionnaire were administered on residents living within 900 m radius of the two sawmill sites in Ile-Ife (Ondo Road and Orisunmibare). Reconnaissance survey showed that there were 914 and 723 residential buildings within 900 m radius around Ondo road and Orisunmibare sawmill sites respectively, and these were further stratified into three zones (1-300 m, 301-600 m and 601-900 m). Random sampling technique was used to select every 5th building within each stratum. Questionnaire was administered on an adult household member in each of the buildings selected; consequently, 325 households were sampled. Data obtained include: socio-economic characteristics, operational procedures and residents' perception of the impacts of sawmill activities on their sustainability. The study revealed that 61.7% of respondents living within the distance of 1-300m in the two sites earn below ₦5000 per month. The result of the probit model showed that sawmill industry in the two sawmill sites created significant impacts on job opportunity (0.63), domestic use for cooking (0.71), wood supply (0.58) and provision of infrastructural facilities (0.63). The study concluded that sawmilling activities contributes significantly to the economic development of residents in the study area.

**Keywords:** Socioeconomic, Variation, Sawmills, Industry, Impacts

## 1.0 Introduction

Industrialisation has been a mixed blessing to mankind. Indeed, since the dawn of civilization, industries have been established to meet various human needs (Ugheoke et al, 2006). As stated by Odubela and Omoniyi (2001), it enhances the quality of life.

Furthermore, industrial activities (mining, manufacturing, transport, sawmilling etc) are important to the economy of a nation as; they support and service rural activities as while it also provides employment opportunities for the general populace (Microsoft Encarta Encyclopaedia, 2008). Industrial activities on the other hand, have done much harm to the natural and in particular, built environment (Odubela and Omoniyi, 2001; Arimoro et al, 2007). This has led several scholars to advocate for rational integration of industrial activities with the component of urban areas (Mahoney and Patterson, 1972; Elias and Gbadegesin, 2011). This is considered necessary because industries pose serious threats to public health and built environment (Odubela and Omoniyi, 2001).

[1] Department of Urban and Regional Planning, Obafemi Awolowo University,Ile-Ife, Nigeria.
E-mail: olapeter1@yahoo.comTelephone:+2348034040638
2 Department of Urban and Regional Planning, Obafemi Awolowo University,Ile-Ife, Nigeria.
olasunkanmi.habeeb@gmail.com, Telephone: +2348060970640

Industries have been classified based on activities carried out in them and the results they are poised to achieve. The classification includes: extractive industry, construction industry and manufacturing industry (Sharmar, 2011).In its own assertion, the International Standard Classification of Industry (2007) opined that industries in the world include; fishing, agricultural (hunting and forestry), mining and quarrying, construction, manufacturing industries (breweries, cotton textile, iron and steel, etc) as well as processing industry (sawmill industry).

Of particular concern to this study however, is the sawmill (a processing industry) in the area under study. Sawmilling has been defined as a process that involves converting log into lumber using different methods such as live sawing (sawing around the log), slash cutting, and cant sawing facility (Okigbo, 1964). The major wood processing industries are typically large capacity facilities industry such as large sawmills, plywood mill, pulp and paper plants and quite large numbers of small scale wood products manufacturing companies such as furniture industries, cabinet makers and carpentry.

In Nigeria, majority of the sawmill industries are located in the wood producing rain forest areas especially all the south-western states, among others. Thus, the largest concentration of sawmills are in Lagos, Ekiti, Osun, Cross River, Ondo, Oyo, Imo, Edo, Delta and Ogun States (Bello and Mijinyawa, 2010). Together, they accounted for over 90 % of the sawmilling activities in the country (Raw Materials Research and Development Council (RMRDC, 2003). This indicates that guaranteed log supply is a major factor in the location of sawmills in the country.

As rightly opined by Ajibefun and Daramola (2004), the sawmilling industry, among other micro-enterprises is in the forefront of promoting the economic growth of the country. The contribution of the sawmilling industry to the country's gross domestic product surpassed that of all other sectors of the economy in the early 1960s except the petroleum industry (Adenuga and Omoluabi, 1975). The industry employs a significant proportion of the rural population in clerical and technical jobs such as: power saw operators, saw doctors and mechanics, as well as in distribution, and wholesale of the wood products (Alvar, 1983). In terms of performance, Aruofor (2003) revealed that Nigerian sawmills capacity is estimated at 11,684,000m3 per annum in log equivalent while capacity utilization was put at 5,422,000.m3 per annum.

The realisation of the impacts of sawmill industry on the built environment has motivated various researchers in recent years (Dosumu and Ajayi, 2002; Arimoro et al, 2007; Anervbcrokhai, 2008; Bello and Mijinjania, 2010). For instance, Dosumu and Ajayi (2002) assessed the problems and management of sawmill waste in Lagos. They discovered that sawmills by nature generate a lot of waste-sawdust. In the absence of proper disposal method, those wastes were burnt in open air. The study concluded that air pollution as a result of waste burning will certainly constitute a health hazard to the population around that particular area.

Likewise, Anervbcrokhai (2008) considered the physical effects of sawmilling activities in relation to the wellbeing of residents in the study areas. His findings showed that sawmilling activities generate toxic substances that are transported in considerable distances away from source and become accumulated in soils, and water body as well as physical damage to the structures such as crack on the wall and deterioration of building. The aforementioned studies only focused on the environmental effects of sawmilling activities without considering the socioeconomic impacts of these activities on the sustainability of residents.

Some other studies considered socioeconomic impact of sawmill industry on residents. These include Okunomo and Achoja (2010); and Egbewole *et al* 2011. Okunomo and Achoja (2010) examined the impact of African Timber and Plywood industry on Sapele community, Nigeria. They concluded that sawmill industry created significant impact on Sapele community through the provision of social amenities and wood supply.

However, despite the fact that they carried out their survey on the socioeconomic impacts of sawmill industry on residents, the conomic effects were not considered vis-à-vis the spatial dimension of the study area.

This study, therefore, is bridging the existing gap as it attempt to examine the socioeconomic impacts of sawmill industry on residents living at varying distances of sawmills in Ile-Ife, Nigeria.

### 1.2 Study Area

The study area, Ile-Ife, is one of the largest and most popular towns in Osun State of Nigeria. It is a traditional city that is widely regarded as the cradle of Yoruba race, a dominant ethnic group in Nigeria located between Latitudes $7^0$ 15'N and $7^0$ 31'N and Longitudes $4^0$ 15'E and $4^0$ 45'E (Salami, 1995). The town presently covers approximately 1846$Km^2$ area of land. The occupational structure of the people indicated that majority are predominantly farmers. The main crops cultivated are kolanut, maize, yam, cassava among others. Migrant farmers from other parts of Nigeria including Oyo, Delta, Akwa-Ibom and Ekiti States, tend to influence the rapid flourishing of agriculture in the area. Due to the increase in physical developmental activities (building construction) that people engage themselves in the study area, there is high concentration of sawmilling activities in every nooks and crannies of the town for the benefits of the people of Ile-Ife and its environments.

### 1.3 Data Sources and Methods

Data for this study were collected from primary and secondary sources. Primary data were collected through administration of questionnaire. The questionnaire was administered on residents living within 900 m radius of the two (2) sawmill sites in Ile-Ife (Ondo Road and Orisunmibare). Reconnaissance survey showed that there were 914 and 723 residential buildings within 900 m radius around Ondo road and Orisunmibare sawmill sites respectively, and these were further stratified into three zones (1-300 m, 301-600 m and 601-900 m). Random sampling technique was used to select every 5th building within each stratum. Questionnaire was administered on an adult household member in each of the buildings selected; consequently, 325 households were sampled. Data collected included the residents' socio-economic characteristics, operational procedures of the sawmills, and residents' perception of the impacts of sawmill activities on their sustainability.

Information obtained were analysed using both descriptive and inferential statistics such as frequencies and percentages, Likert scale, ANOVA, Chi square test ($\chi^2$) and probit model.

To determine residents' perception on the impacts of sawmill activities in the study area, residents were provided with a list of indicators identified in the literature. They were further instructed to rate each of the identified positive effects of sawmill activities. Residents were to express their opinion using one of five Likert scales of 'Strongly agree (SA), 'agree (A), 'neither agree or disagree (NAD), 'disagree (D) **and '**strongly disagree (SD).

The analyses of the ratings indicated by the residents from the Likert's scales adopted evolved into an index called 'Resident Level of Agreement Index' (RLAI). To arrive at RLAI, weight value of 5,4,3,2 and 1 were respectively attached to strongly agreed (SA), agreed (A), just agree (JA), disagree (D) and strongly disagree (SD). The index for each aspect was arrived at by dividing the Summation of Weight Value (SWV) by the total number of responses. The SWV for each aspect is obtained through the addition of the product of the number of responses to each aspect and the respective weight value attached to each rating.

This is mathematically express as SWV = $\sum_{I=1}^{5} X_i Y_i$ ………………………………(1)

SWV = summation of weight value,

$X_i$ = number of respondents to rating i;
$Y_i$ = the weight assigned a value (i = 1, 2, 3, 4, 5).

The index for each identified effects thus takes a value of between 5 and 1. The nearer the value to 5, the higher is the occurrence that residents attached to such effects under consideration.

$$RLAI = \frac{SWV}{\sum_{i=1} i = X_i} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The mean index for each of the residential zones and that of sawmill sites was computed. This is obtained by summing the indices of all impacts indicators and dividing by the number of the identified impacts (n = 7).

The mean index for stratum below 300m, stratum between 301-600m and 601-900m were denoted respectively by $RLAI_{r300,}$ $RLAI_{r300\text{-}600}$ and $RLAI_{r601\text{-}900}$. Findings are as presented in the Table 2.

The probit model is stated in the implicit form as IMP = F ($X_1$, $X_2$, $X_3$, $X_4$, $X_5$, $X_6$, $X_7$). Probit model of an event (e.g. impact) occurring, is a function of a set of nonstochastic explanatory variables and a vector of unknown parameter. In this case, the dependent variable (impact) is measured on binary scale (i.e. probability of 0 (zero) and 1 (one). The probit model is specified as: Pi = C/ (1 + e –zi)
Where Pi is the probability that an impact was created or not by the sawmill industries in the study area, given the information embodied in index Zi, and C is a constant. Index Zi, though unobserved was investigated as being predicted by the following regression model:

$$Zi = \beta 0 + B_1X_1 + \beta_2X_2 + \ldots + \beta_kX_k \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where $X_1$ to $X_k$ are the variables through which sawmill industry created impact.

**Table 1: Description of Symbols of Variables in the Model**

| Variables | Description | Measurement |
|---|---|---|
| Pi | Probability that an impact was created or not | 1 if yes, 0 otherwise |
| $X_1$ | Job opportunity | 1 if yes, 0 otherwise |
| $X_2$ | Domestic use | 1 if yes, 0 otherwise |
| $X_3$ | Wood supply | 1 if yes, 0 otherwise |
| $X_4$ | Provision of social amenities | 1 if yes, 0 otherwise |
| $X_5$ | Provision of Infrastructural facilities | 1 if yes, 0 otherwise |
| $X_6$ | Industrial use | 1 if yes, 0 otherwise |
| $X_7$ | Scholarship opportunity | 1 if yes, 0 otherwise |

## 1.4 Results and Discussion

The research findings are discussed under the various headings below. Except otherwise stated, all the tables through which information are summarized below emanated from the author's field survey of 2014.

### 1.4.1 Socio-Economic Characteristics of Residents

Residents' socioeconomic and demographic characteristics in different residential zones of the two sawmill sites were investigated. The socio-economic characteristics include gender, educational attainment, income, household size and length of residence.

These variables were considered for the analysis because they were found significant in the literature for the assessment of the positive impacts of sawmills on the livelihood residents. The frequency distribution of these variables with respects to the different residential zones is summarized in Table 2.

It was revealed that majority of the respondents are male and this is consistent in the three strata around the sawmill sites. Out of 119 respondents around Ondo Road sawmill sites, there are 14 respondents (11.8%) in stratum 1-300m, out of which 10 respondents (71.4%) are male, while male respondents in the stratum within 301-600 metres and 601-900 metres accounts respectively for 77.6% (38 respondents) and 70.6% (84 respondents) of the total respondents in each stratum. Around Orisunmibare site, male respondents also represent the larger percentage of the respondents as they account for 65.0%, 67.1% and 78.9% in the three strata respectively. The reason for the foregoing is due to the fact that the administered questionnaires were targeted at household heads in the various strata.

Educational background of residents is another important socio-economic variable considered in this study. It was discovered that respondents that had no formal education dominates stratum 1-300m of the two sites with 8(57.1%) and 12(60.0%) respondents in Ondo Road and Orisunmibare sites respectively. In the second stratum (301-600m) majority of the respondents 30(61.2%), 41(48.2) in the two sites respectively had at least secondary school leaving certificate in the study areas. However, stratum 601-900m demonstrates relatively educationally enlightened respondents. This is because 64(53.7%) residents in Ondo Road site and 14(36.8%) in Orisunmibare site represents people that had tertiary level of education in the two sites. Specifically, it is shown in the table that there was variation in the educational distribution of respondents around the three strata. This was further corroborated by chi square results ($\chi^2$ = 43.323 & p = 0.000, $\chi^2$ = 61.511 & p = 0.000).

Closely related to educational status of respondents is their income level which is presented in Table 2. It is evident from the table that majority of respondents living within the distance of 1-300m in the two sites earn below ₦5000. That is, 61.7% of respondents within 1-300m are living below 1 dollar per day which United Nations considered as extreme poverty (Mazzarol and Choo, 2003). The income of the respondents in the second stratum (301-600m) in both sites is better than that of the first stratum.

It is seen that 61 (51.3%) and 42 (49.4%) respondents in Ondo Road and Orisunmibare respectively earn ₦31,000 and above. The table also revealed that respondents earning ₦31,000 and above dominates the third strata in the two sites which represents 61 (51.3%) and 18 (47.4%) in Ondo Road and Orisunmibare respectively. From the above, it can be inferred that apart from the fact that the distribution of income in the residential strata is associated with the educational status of respondents in the areas, their income influences their choice of residential location. Besides, it can be concluded that as distance increases from the sites, there was an increase in the level of income in the study area. The results of one way ANOVA computed also revealed that income varied significantly in the three residential strata around the two sites. The F values of 102.329 and 98.323 significant at 0.000 established this.

Following Badiora and Afon (2013), household size for the study was categorized into three. These are household with 6 members and below, household that contains 7 to 10 members and household with more than 10 members. These were respectively regarded as the small sized, medium and large sized household. The average household size for residents living within 900 metres of Ondo road sawmill site was 7 while it was 9 in stratum 1-300m, 7 and 5 in the stratum within 301-600 metres and 601-900 metres respectively. The average household size for residents within 900 metres radius of Orisunmibare site was 7.5, while it was 8 in stratum 1-300m, and 7 and 5 in the stratum within 301-600 metres and 601-900 metres respectively.

Another important attribute of residents that has been established to be significant to this study is the length of stay in a residence. The minimum length of residence was one year, while the maximum was 38 years in Ondo Road. In Orisunmibare, the minimum length of residence was one year while the maximum was 39.

It was revealed that the proportion of residents who had resided in the study area for longer period of years increased as distance increases. For instance, in Ondo Road a total number of 1.1%, 13.7% and 29.7% of residents within 0-300m, 301-600m and 601-900m radius respectively have resided in the area within 0 to 10 years; while, 2.8%, 8.4% and 20.9% of respondents in Orisunmibare have respectively resided within 0-300m, 301-600m and 601-900m radius, for between 0 t0 10 years

From the foregoing, it can be deduced that there was a significant variation between distances of residences from sawmills and their socioeconomic characteristics in two sawmill sites. It is therefore expected that variation will exist in the impacts of sawmill industry on residents in the study area. The next section of this study is focused on this.

**Table 2: Residents' Socio-Economic Background**

| Socio-Economic Variables | Ondo Road Site | | | | Orisunmibare Site | | | | Ile-Ife |
|---|---|---|---|---|---|---|---|---|---|
| **Gender** | **Below 300m** | **300m-600m** | **601m-900m** | **Total** (%) | **Below 300m** | **300m-600m** | **601m-900m** | **Total** (%) | |
| Male | 10(71.4) | 38 (77.6) | 84(70.6) | 132(72.5) | 13(65.0) | 57(67.1) | 30(78.9) | 100(69.9) | 232(71.4) |
| Female | 4(28.6) | 11 (22.4) | 35(29.4) | 50(27.5) | 7(35.0) | 28(32.9) | 8(21.1) | 43(30.1) | 93(28.6) |
| **Total** | 14(100.0) | 49(100.0) | 119(100.0) | 182(100.0) | 20(100.0) | 85(100.0) | 38(100.0) | 143(100.0) | 325(100.0) |
| **Educational background** | | | | | | | | | |
| None | 8(57.1) | 4(8.2) | 7(5.9) | 19(10.4) | 12(60.0) | 7(8.2) | - | 19(13.3) | 38(11.7) |
| Primary | 1(7.1) | 10(20.4) | 22(18.5) | 33(18.1) | 7(35.0) | 33(38.8) | 6(15.8) | 46(32.2) | 79(24.3) |
| Secondary | 4(28.6) | 30(61.2) | 26(11.8) | 60(35.2) | 1(5.0) | 41(48.2) | 18(47.4) | 60(42.0) | 120(36.9) |
| Tertiary | 1(7.1) | 5(10.2) | 64(53.7) | 70(38.5) | - | 4(4.7) | 14(36.8) | 18(12.6) | 88(27.1) |
| **Total** | 14(100.0) | 49(100.0) | 119(100.0) | 182(100.0) | 20(100.0) | 85(100.0) | 38(100.0) | 143(100.0) | 325(100.0) |
| **Income group(₦)** | | | | | | | | | |
| 5,000 and below | 8(57.1) | 10(20.4) | 25(21.0) | 43(23.6) | 13(65.0) | 5(5.8) | 2(5.3) | 20(16.1) | 63(19.4) |
| 5,001-10,000 | 3(21.4) | 8(21.4) | 7(5.9) | 19(10.4) | 6(30.0) | 8(9.4) | 2(5.3) | 16(11.2) | 35(10.8) |
| 10,0001-20,000 | 2(14.3) | 13(26.5) | 16(13.4) | 31(17.0) | 1(5.0) | 20(23.8) | 8(21.1) | 29(20.3) | 60(18.5) |
| 20,001-30,000 | 1(7.1) | 8(16.3) | 10(8.4) | 19(10.4) | - | 10(11.7) | 8(21.1) | 18(12.6) | 37(11.4) |
| Above 30,000 | - | 10(20.4) | 61(51.3) | 71(39.0) | - | 42(49.4) | 18(47.4) | 60(50.0) | 131(40.3) |
| **Total** | 14(100.0) | 49(100.0) | 119(100.0) | 182(100.0) | 20(100.0) | 85(100.0) | 38(100.0) | 143(100.0) | 325(100.0) |
| **Household size** | | | | | | | | | |
| Small | 1(7.1) | 6(12.2) | 44(37.0) | 51(28.0) | - | 2(9.5) | 19(50.0) | 21(14.7) | 71(22.2) |
| Medium | 3(21.4) | 21(42.9) | 37(31.1) | 61(33.5) | 7(35.0) | 43(50.6) | 11(28.9) | 61(42.7) | 122(37.5) |
| Large | 10(71.4) | 22(44.9) | 38(31.9) | 70(38.5) | 13(65.0) | 40(47.1) | 8(21.1) | 61(42.7) | 131(40.3) |
| **Total** | 14(100.0) | 49(100.0) | 119(100.0) | 182(100.0) | 20(100.0) | 85(100.0) | 38(100.0) | 143(100.0) | 325(100.0) |
| **Length of Residence** | | | | | | | | | |
| Below 10 years | 2(1.1) | 25(13.7) | 54(29.7) | 81(44.5) | 4(2.8) | 12(8.4) | 12(20.9) | 28(19.6) | 109(33.5) |
| 10-20 years | 5(2.7) | 18(9.9) | 43(23.6) | 66(36.3) | 6(4.2) | 35(24.5) | 19(13.1) | 60(50.0) | 126(38.8) |
| Above 20years | 7(3.8) | 6(3.3) | 22(12.1) | 35(19.2) | 10(50) | 20(13.9) | 7(4.9) | 37(25.9) | 90(27.7) |
| **Total** | 14(100.0) | 49(100.0) | 119(100.0) | 182(100.0) | 20(100.0) | 85(100.0) | 38(100.0) | 143(100.0) | 325(100.0) |

1.4.2 Operational Procedure of Sawmilling Activities in the Study Area

This section contains data collected and analysed on the operational procedure of sawmilling activities from residents in Ondo road and Orisunmibare sawmill sites. Sawmilling activities are discussed in terms of materials for sawmilling activities, period, hours and days of operation as well as waste generated from the sawmills and method of disposal.

As part of the study of sawmilling activities, materials used during the process are presented in Table 3. The tools identified include: circular saw, stack machine and saw table. The study also investigated the period of operation of sawmilling activities on daily basis. As presented in Table 2, 27(90%) respondents stated that operation took place from morning to evening, while 3(10%) believed that sawmilling activities mostly took place in the afternoon. This implies that sawmilling activities took place from morning to evening. The foregoing findings were complemented with investigation on the number of hours that saw miller work on daily basis. It was found out that 25 saw millers (83.4%) worked between 7 to 9 hours daily, while 5 saw millers (16.6%) worked above 10 hours and 6 hours below daily. This implies that many of the respondents have stayed long enough in the site to experience its impact on the environment.

It is also important in this study to ascertain the days saw millers spend at work. It was established that 25 saw millers (83.3%) worked from Monday through Saturday, while the proportions of saw millers that believed the operation takes place everyday represents 16.7% of respondents. It could therefore be inferred that sawmilling activities takes place mainly from Monday through Saturday in Ondo Road and Orisunmibare sites.

Further investigation in Table 3 revealed that 15(50%) respondents had already spent 11 to 20 years in the two sites, 8(26.7%) respondents have spent 10years and below in this activity, while 7 saw millers (23.3%) have spent over 21 years. This implies that sawmilling activity had lasted in the two sawmill sites for over 20 years.

**Table 3: Sawmilling Activities in the Study Area**

| | **Sawmill Sites** | | | | **Total** |
|---|---|---|---|---|---|
| **Materials for Sawmilling Activities** | Ondo Road | (%) | Orisunmibare | (%) | |
| Circular saw | 21 | 70.0 | 9 | 30.0 | 30(100) |
| Stack machine | 21 | 70.0 | 9 | 30.0 | 30(100) |
| Life crane | 21 | 70.0 | 9 | 30.0 | 30(100) |
| Saw table | 21 | 70.0 | 9 | 30.0 | 30(100) |
| Wheel barrow | 21 | 70.0 | 9 | 30.0 | 30(100) |
| **Days of Operation** | | | | | |
| Monday to Saturday | 18 | 85.7 | 7 | 77.8 | 25(83.3) |
| All days | 3 | 14.3 | 2 | 22.2 | 5(16.7) |
| Total | 21 | 100 | 9 | 100 | 30(100) |
| **Hours of operation** | | | | | |
| 6 hours and below | 3 | 9.5 | 1 | 11.1 | 4(13.3) |
| 7-9hours | 17 | 85.8 | 8 | 88.4 | 25(83.4) |
| 10 hours and above | 1 | 4.8 | - | - | 1(3.3) |
| Total | 21 | 100 | 9 | 100 | 30(100) |
| **Period of operation** | | | | | |
| Afternoon | 2 | 9.5 | 1 | 11.1 | 3(10.0) |
| Morning to Evening | 19 | 90.5 | 8 | 88.9 | 27(90.0) |
| Total | 21 | 100.0 | 9 | 100.0 | 30(100.0) |
| **Years Spent in Sawmilling Activities** | | | | | |
| 10 years and below | 5 | 23.8 | 3 | 33.3 | 8(26.7) |
| 11-20 years | 12 | 57.1 | 3 | 33.3 | 15(50.0) |
| 21 years and above | 4 | 19.0 | 3 | 33.3 | 7(23.3) |
| Total | 21 | 100 | 9 | 100.0 | 30(100) |

It is important to also examine waste generated and waste disposal method in the sites. The study revealed that five different types of wood waste are generated during sawmilling activities. These are tree barks, cut slabs, sawdust, plain shavings and strips. These identified wood waste materials were produced in the two sawmill sites in the study area.

The different wood waste components generated during operation were disposed using different methods. Six disposal methods were identified during the field survey (See Table 4). The most popular method of disposal was open burning as this accounted for 39.5% of the methods used for disposing wood waste accumulated for a period of two weeks.. This method of disposal was most popular in Ondo Road and Orisunmibare sawmill sites. Indeed, 39.6% and 31.1% of respondents in the sites respectively claimed that this method was in use.

Other methods identified included: dumping inside designated open space (35.5%), dumping on vacant plots of land (11.8%), dumping along streams/river banks (5.3%), use of drains during rainfall and burying (which represented 3.9% of the total respondents' method of disposing waste in the study areas).

**Table 4: Wood Waste Components Produced During Sawmilling Activities**

| Materials | Ondo Road Frequency (%) | Orisunmibare Frequency (%) | Total |
|---|---|---|---|
| **Sawdust** | 21 (27.6) | 9 (29.0) | 30 |
| **Cut slabs** | 19 (25.0) | 8 (25.8) | 27 |
| **Tree barks** | 15 (19.7) | 6 (19.4) | 21 |
| **Strips** | 12 (15.8) | 5 (16.1) | 17 |
| **Plain shavings** | 9 (11.8) | 3 (9.7) | 12 |
| **Total** | 76 (100) | 31 (100) | 107* |

*Note: This exceeded number of questionnaire administered because of multiple responses

1.4.3 Residents' Perception on the Impacts of Sawmill Activities

This study investigated the socioeconomic impact of sawmilling activities in Ile-Ife from the perception of the residents. The mean indexes for stratum 0-300 m in Ondo road and Orisunmibare sawmill sites denoted by RLAIr300 were 3.58 and 3.08 respectively. In stratum 301-600 m of the two sites, the mean indexes denoted by RLAIr300-600 were 3.15 and 3.11 respectively. While the mean indexes for stratum 601-900 m radius of Ondo road and Orisunmibare sawmill sites denoted by $RLAI_{r601-900}$ were 3.38 and 3.31 respectively (see Table 5). From these computations, it was evident that the residents' level of agreement with the different socioeconomic impacts of sawmilling activities in each of the three residential zones of the two sites under investigation was very close. In other words, residents' agreement with the identified impacts was not influenced much by the spatial variation in the socio-economic and demographic attributes of residents. Furthermore, the proposition that sawmill activities employs a significant proportion of residents, used as domestic fire wood for household needs and wood supply to the residents ranked first, second and third in the socioeconomic impacts of sawmilling activities respectively in the different residential zones of the two sawmill sites.

However, the proposition that sawmilling activities provide scholarships opportunity for prospective students and used for industrial purpose ranked least in the different residential zones of the two sawmill sites. This finding thus substantiated earlier assertions by Adenuga and Omoluabi (1975) and Ajibefun and Daramola (2004) that sawmill industry employs a significant proportion of urban and rural population while also contributing significantly to the economy of that particular environment.

Furthermore, the impacts of sawmilling activities on the residents of the two sawmill sites was analysed using probit model. The purpose of the model is to estimate the probability that an observation with particular characteristics will fall into a specific one of the categories; moreover, if estimated probabilities greater than 1/2 are treated as classifying an observation into a predicted category, the probit model is a type of binary classification model. The probit model was used to determine the impacts of sawmilling activities on economic development of residents in the study area. In this model, the responses were measured by binary scale. The result of the probit model is presented in Table 6.

The probit model revealed that four out of the seven variables captured in the model were significant. They are job opportunity ($X_1$), domestic use ($X_2$), wood supply ($X_3$) and provision of social amenities ($X_4$). These variables were significant in the model due to their high coefficient values (0.63, 0.71, 0.58 and 0.63 respectively) and the positive relationship that existed between them and impacts. However, the three remaining variables (provision of infrastructural facilities ($X_5$), industrial use ($X_6$) and Scholarship opportunity ($X_7$)) were not significant due to their low coefficient values.

The model also revealed an average log likelihood of 0.52 (52%). This means that the tendency of Ondo road and Orisunmibare sawmill industries to create socioeconomic impact on Ile-Ife community was 52%. This study therefore, established that sawmilling activities contributes significantly to the economic development of residents in the study area.

**Table 5: Residents' Perception on the Impacts of Sawmill Activities**

| **Below 300m** | | **300m-600m** | | **601m-900m** | | **Ondo Road site** | |
|---|---|---|---|---|---|---|---|
| | **$RLAI_{r300}$** | | **$RLAI_{r300-600}$** | | **$RLAI_{r601-900}$** | | |
| Job opportunity | 3.92 | Domestic use | 3.32 | Wood supply | 3.87 | Domestic use | 3.70 |
| Domestic use | 3.76 | Wood supply | 3.26 | Social amenities | 3.75 | Wood supply | 3.59 |
| Wood supply | 3.76 | Job opportunity | 3.23 | Domestic use | 3.56 | Job opportunity | 3.52 |
| Social amenities | 3.67 | Industrial use | 3.18 | Industrial use | 3.42 | Industrial use | 3.42 |
| Infrastructural facilities | 3.41 | Infrastructural facilities | 3.18 | Infrastructural facilities | 3.31 | Infrastructural facilities | 3.30 |
| Industrial use | 3.38 | Social amenities | 3.03 | Job opportunity | 2.98 | Social amenities | 3.13 |
| Scholarship opportunity | 3.18 | Scholarship opportunity | 2.84 | Scholarship opportunity | 2.76 | Scholarship opportunity | 2.93 |
| **Mean Index** | **3.58** | | **3.15** | | **3.39** | | **3.37** |
| **Below 300m** | | **300m-600m** | | **601m-900m** | | **Orisunmibare site** | |
| Job opportunity | 3.45 | Domestic use | 3.67 | Wood supply | 4.21 | Job opportunity | 3.78 |
| Domestic use | 3.36 | Wood supply | 3.52 | Social amenities | 3.71 | Domestic use | 3.53 |
| Infrastructural facilities | 3.17 | Job opportunity | 3.29 | Domestic use | 3.52 | Infrastructural facilities | 3,33 |
| Wood supply | 3.09 | Industrial use | 3.12 | Infrastructural facilities | 3.31 | Wood supply | 3.17 |
| Social amenities | 2.89 | Social amenities | 2.89 | Industrial use | 3.19 | Social amenities | 2.99 |
| Industrial use | 2.84 | Infrastructural facilities | 2.74 | Job opportunity | 2.71 | Industrial use | 2.76 |
| Scholarship opportunity | 2.79 | Scholarship opportunity | 2.51 | Scholarship opportunity | 2.53 | Scholarship opportunity | 2.61 |
| **Mean Index** | **3.08** | | **3.11** | | **3.31** | | **3.14** |

**Table 6: Covariance Matrix Computed Using Second Derivatives**

| **Variable** | **Coefficient** | **Standard error** | **Z statistic** | **Sig.** |
|---|---|---|---|---|
| $X_1$ | 0.625716 | 0.394781 | 2.957816 | 0.0026 |
| $X_2$ | 0.712451 | 0.218753 | 3.125674 | 0.0134 |
| $X_3$ | 0.576213 | 0.556753 | 2.456718 | 0.0031 |
| $X_4$ | 0.634581 | 0.236573 | 2.987123 | 0.0125 |
| $X_5$ | 0.345716 | 0.406387 | 0.753271 | 0.7652 |
| $X_6$ | 0.276154 | 0.367689 | 0.467518 | 0.5672 |
| $X_7$ | 0.471654 | 0.283564 | 0.914567 | 0.5525 |
| Avg. | 0.520355 | | | |

## 1.5 Conclusion

The study examined socioeconomic impacts of sawmill industry on residents in Ile-Ife. The study discovered that some significant socioeconomic variables like educational status and income of respondents varied across the residential zones of the sawmill sites. It was also discovered that operation takes place from morning to evening, and sawmilling activities takes place majorly from Monday through Saturday in Ondo road and Orisunmibare sites. Also, the most popular method of waste disposal in the sawmill sites was burning.

The study revealed that the presence of sawmills in the study area provided employment to the people of the areas while it also contributed to infrastructural developments such as well, access roads, electricity among others.

The policy implication of this study is that location and activities of sawmill industry have the inherent to meet some socio-economic demands of the nation such as the generation of revenue and employment as well as provision of infrastructure for development. From the foregoing, it is not out of place to conclude that the advancement of sawmilling activities is germane to the development of the nation.

## References


Adenuga, B. O. and Omoluabi, C.A. (1975): "Sawmilling in Nigeria!, Seminar on Sawmilling for Developing Countries, Kolka, p.36.

Ajibefun, I. A. and Daramola, A.G. (2004): Determinant of technical and allocative Efficiency of micro-enterprises: Firm-level evidence from Nigeria!. African Development Review, Vol. 15. pp.353-95.

Alvar, G. O. (1983): Sawmilling Industry in Nigeria, Field Document No. 17, FAO, Rome.

Anavberokhai. I. O. (2008): Environmental Aspects Review "A Case Study of Two Sawmills In Etsako-West, Edo State Nigeria". Department of Technology and Built Environment, University of Gavle.

Arimoro, F. O, Ikomi, R. B. and Efe C. O (2007): The Impact of Sawmill Wood Wastes on The Water Quality and Fish Communities of Benin River, Niger Delta Area, Nigeria.World Journal of Zoology. 1 (2): Pg94-102.

Aruofor. R. O. (2000): Review and improvement of data related to wood-products in Nigeria.

EC-FAO Partnership Programme (1998-2001) Tropical forestry Budget line B7-6201/97-15/VIII/FOR PROJECT GCP/INT/679/EC.

Badiora, A. I., Afon, A. O., (2013) Spatial Pattern of Crime in Nigerian Traditional City: The Ile-Ife Experience. International Journal of Criminology and Sociological Theory, Vol. 6, No.3,pg 15-28.

Bello. R. S, Mijinyawa. Y. (2010):Assessment of Injuries in Small Scale Sawmill Industry of South Western Nigeria. Journal of Scientific Research and Development. Manuscript 1558. Vol. XII, March, 2010.

Dosunmu, O. O. and Ajayi A. B. (2002): Problems and management of sawmill waste in Lagos, Proceedings of International Symposium on Environmental Pollution Control and Waste Management, Tunis (EPCOWM 2002), pp 271-278.

Egbewole, Z. T., Ogunsanwo, O. Y. and Omole, A. O. (2011): Technical Efficiency of Lumber Recovery from High Forest Tree Species In Selected Sawmills Of South-western Nigeria. Nigerian Journal of Agriculture, Food and Environment. 7(1):34-41

Elias, P. and Gbadegesin, A. (2011): Spatial Relationships of Urban Land Use, Soils and Heavy Metal Concentrations in Lagos Mainland Area. Journal of Application and Science Management, Vol. 15 (2) 391 – 399.

International Standard Classification of Industry (2007): Revision – 3

Mahoney, J. R. and Patterson, R. M. (1972): A variable emission for air pollutants in the vicinity of urban roads. In: Proceedings of the Conference on Urban Environment and Second Conference on Biomeorological Society. Philadelphia, American Meteorological Society, 1972, pp. 57-61.

Mazzarol, T & Choo, S. (2003): A study of the factors influencing the operating location decisions of small firms. Property Management, 21(2), 190-208.

Microsoft Encarta Encyclopedia (2008) Industry Microsoft Encarta ® Corporation.

Odubela M. T, Omoniyi I. I. (2001): Compliance Monitoring in Nigeria's Industries. Fourth International Conference on Environmental Enforcement, Federal Environmental Protection Agency, P. M. B. 3150, Surulere, Lagos, Nigeria.

Okigbo, L (1964): A Report On Sawmill Industry In Nigeria, Published By the Federal Department of Forest Resources, Ibadan , Nigeria,45pp.

Okunomo, K, Achoja, F.O. (2010): Economic Impact Assessment of African Timber And Plywood Company in Sapele, Delta State, Nigeria. African Journal of General Agriculture. Vol. 6, No. 3, September 30

Raw Materials Research and Development Council (RMRDC), (2003): Multi-disciplinary committee report of a techno-economic survey on Wood and Wood Products Sector (4th update) December 2003. Pub. Raw Materials Research and Development Council.

Ugheoke1A.J, Ebomoyi M. I. And. Iyawe V. I (2006): Influence of Smoking on Respiratory Symptoms and Lung Function Indices in Sawmill Workers in Benin City, Nigeria. Nigerian Journal of Physiological Sciences 21(1-2):49-54.