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EFFECTS OF SAWMILL WASTES IN RESIDENTIAL AREAS OF OGBESE AND AKURE TOWNSHIPS, ONDO STATE, NIGERIA

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ABSTRACT: This research examines the volume of waste generated by sawmill industries vis-à-vis the management method adopted by sawmills and the prevailing diseases in the study areas and proffer appropriate solutions that is expected to improve the residential environment and make it more aesthetic and therefore improve the health of the people. The study made use of both primary and secondary data. The primary data were collected through the administration of structured questionnaire which was administered on household-heads within 1-kilometer radius of the selected sawmill industries. The second, which was administered on the sawmill operators, examined the waste management practices and safety health measures adopted by the saw millers. The third set of questionnaire was administered on Town Planning Authorities, covering the location of the sawmill industries. Random systematic sampling method was employed to select the residents within the two study areas. Statistical Package for Social Sciences (SPSS) was used for data processing. Analysis of data was carried out using descriptive and inferential statistics. The findings of this research clearly reveal the locations of sawmill industries in the study areas, the volume of waste generated by each sawmill industry including the various modes of waste disposal practices adopted. It also reveals the various ways by which sawmill wastes can be put into use and went further to expose the various environmental and health problems pose by the operation of sawmill industries. Finally, relevant recommendations were made to find solution to the various problems pointed out by the researcher.

KEYWORDS: Log, Wood, Safety, Health, Pollution, Industries.

1 INTRODUCTION

Sawmill is a primary wood processing industry which has since its inception continued to make significant contribution to the economic development of not only Nigeria, but the world at large.

The Sawmill is presently a notable employer of labour in the countries where it exists. Sawmill Industries provide about 2% of the world's overall gross domestic product (GDP). [1]. In developing countries like Nigeria, the Sawmill Industries currently contribute an average of about 2.7% of G.D.P. which keeps on increasing at a faster rate [2]. Sawmill has continued to service other wood based industries locally and internationally.

Sawmill thus represents an important economic force for development, particularly in those developing countries with substantial endowment of forest resources like Nigeria.

In Nigeria majority of the sawmill industries are located in the wood producing rain forest areas of Nigeria. The largest concentration of sawmills are in Lagos, Ekiti, Osun, Cross river, Ondo, Oyo, Imo, Edo, Delta and Ogun State, together, they account for over 90% of the saw milling activities in the country [3].

Saw mill by its nature generates a lot of wastes such as; saw dusts, wood off cuts, wood backs, plain shavings, wood rejects, etc. As the demands for wood and its products increase, the volume of wastes being generated cannot but increase. In the absence of proper disposal methods, these wastes are burnt in the open air. Hence, one of the greatest environmental problems facing the industry today is how to properly dispose the waste generated daily by the ever increasing activities of the sawmill industries.

Waste generation is a concomitant aspect of living; it cannot be eliminated but can only be managed, [4]. The problems posed by these wastes are many. They degrade the urban environment, reduce its aesthetic value, produce offensive odours during the rains and pollute the air with smoke when the wastes are burnt uncontrollably. They also constitute health hazards when they are not timely disposed. They become breeding places for worms and insects. They also pose bad working environment for those working in the area, due to accumulation of wastes over a period of time most especially during raining season.

In view of this, the researcher critically consider the works of past scholars on similar problems such as that of Aina, [5] which deals mainly on sawmill waste utilization for energy generation,[6] Dosunmu and Ajayi wrote on problem and management of sawmill waste in Lagos, [7] Lucas wrote on ways of improving Lumber recovery from a live-sawn log in sawmills, among others, realizing that none as actually consider the effects of Sawmill waste on the adjoining residents. In-view of this, this research is out to fill the vacuums created by enlighten the residents and other members of the public on the danger inherent in living close to sawmill industries.

2 METHODOLOGY

Structured questionnaires were used to obtain the relevant data from the residents, the saw millers, and Area Town Planning Offices for Akure North and Akure South Local Government, while interview guides was employed to obtain data from village heads, health workers, in addition some photographs of scenery of interest were snapped by the researcher and coupled with personal observations. The waste disposal method, health safety measures, income of respondents, distance between respondents houses and sawmill among others are gotten with the aid of questionnaires.

Random Systematic sampling methods was employed to select the residents within the two study areas. In Akure, the existing Sawmill Industries were identified in five (5) operating corridors. These are Ado, Oda, Idanre, Ondo Roads and Road Block. These were used as the basis for selection of residential areas and respondents. Ogbese is divided into two by river Ogbese, the first part is known as Ayede Ogbese and the second Oke-Odo Ogbese.

House count was conducted within one-kilometer radius from each sawmill, a distance indicated by Ministry of Health, Ondo State as health critical distance to sawmill industry [8]. This was achieved with the use of Google earth at a low resolution. Twenty-five percent (25%) of the houses in each of the Identified sawmill industrial corridors were selected using random systematic sampling method. one house hold head was picked in the selected residential buildings for the administration of the questionnaire. Twenty five percent (25%) of the sawmill industry in the study areas were randomly selected for investigation.

Table 1: Questionnaire Distributed to Respondents in the Study Areas (Akure & Ogbese)

S/N	Industrial Corridors	Houses in Industrial Corridors	25% of the Houses	Questionnaire Distributed	Questionnaire Returned	% Recovered
AKURE						
1.	Ado Road	192	48	48	46	**95.8**
2.	Oda Road	121	30.2	30	30	**100**
3.	Oke-Aro	200	50	50	49	**98**
4.	Ondo Road	186	46.3	46	39	**84.8**
5	Road Block	150	37.5	38	30	**78.9**
Sub-Total	**5**	**848.8**	**212**	**212**	**194**	**91.5**
OGBESE						
6.	Ayede	352	88	88	78	**88.6**
7.	OKe-Odo	96	24	24	17	**85.0**
Sub-Total	**2**	**448**	**112**	**112**	**95**	**84.8**
Ground Total	**7**	**1,296.8**	**324**	**324**	**289**	**89.2**

Source: *Author's Research Design, 2014*

Finally, drawing on the concept of homogenous population and given the assumption that the socio-economic indicators of each of the households are nearly the same, [9] one (1) household-head was randomly picked in each of the selected residential buildings for the administration of the household questionnaire. The total sampled size of 324 was considered adequate for the study within the seven identified sawmill industrial corridors, boiling down to an average of 46 parsons per corridor.

Modes of operation in sawmill industries are similar as they make use of the same type of machines. Due to this, an average of twenty one point four percent (21.4%) of the sawmill industries in the study areas were randomly selected to represent the sample size for the sawmill industries investigated

Table 2: Sampled Sawmills in the Study Areas (Akure and Ogbese)

S/N	Industrial Corridors	Total No. of Sawmill	Average Numbers/Names of Selected 21.4% of Sawmill Industries		% Sampled
1	Ado Road	4	1	Australia Sawmill	25
2	Oda Road	2	1	Elemon sawmill	50
3	Idanre Road	4	1	Musayayi I sawmill	25
4	Ondo Road	28	3	Jebe Sawmill, Olukayode Sawmill, Ojuenimala Sawmill	14.3
5	Road Block	15	2	Oyo Sawmill, Austin sawmill	13.3
Sub-Total	**5**	**53**	**8**		
	OGBESE				
6	Ayede	17	2	J-Eze Okoli Sawmill, Unifous Sawmill	11.7
7	Oke-Odo	11	1	Eje Jesu Sawmill	10.5
Sub-Total	**2**	**28**	**3**		
Ground Total	**7**	**81**	**11**		**21.4**

Source: *Author's Research Design, 2014*

Statistical Package for Social Sciences (SPSS) 16th Version was used for data processing. Analysis of data was carried out using descriptive and inferential statistics. The descriptive method utilizes tables, charts and pictorial illustrations. The inferential approach utilizes the chi-square analysis in testing the formulated research hypotheses.

Secondary data was obtained from relevant textbooks, journals, conference and seminar papers, relevant maps, internet, and dissertation/thesis. Other areas where relevant data was derived include the Environmental Office at Akure North and Akure South Local Government Council, Local Government Secretariat and the offices of the Agricultural Development Project (ADP), the Basic Health Centre at Ayede Ogbese was also visited. Information such as the prevalent diseases was gotten from the Basic Health Centre at Ogbese. The maps used for this research were from the ministry of works at Akure North Local Government Area. The average number of logs worked on per day by each sawmill were gotten from Ondo State Ministry of Forest Department among others.

3 FINDINGS

The findings from this study shows that a sizeable proportion of the population at Ogbese were mostly low income earners and the responses received revealed that poverty is prevalent amongst the people, going by estimation of high density average occupancy rates of 12 persons per room, [10]. The per capital income of majority of the people (54.6%) and (66.3%) Akure and Ogbese respectively was very low, an indication of socio economic status below the poverty line; going by the United Nation's declaration which approximates absolute poverty to mean living below $1 per day while relative poverty is living below $2 per day, [11].

Table 3: Respondents level of Income (% in Parenthesis)

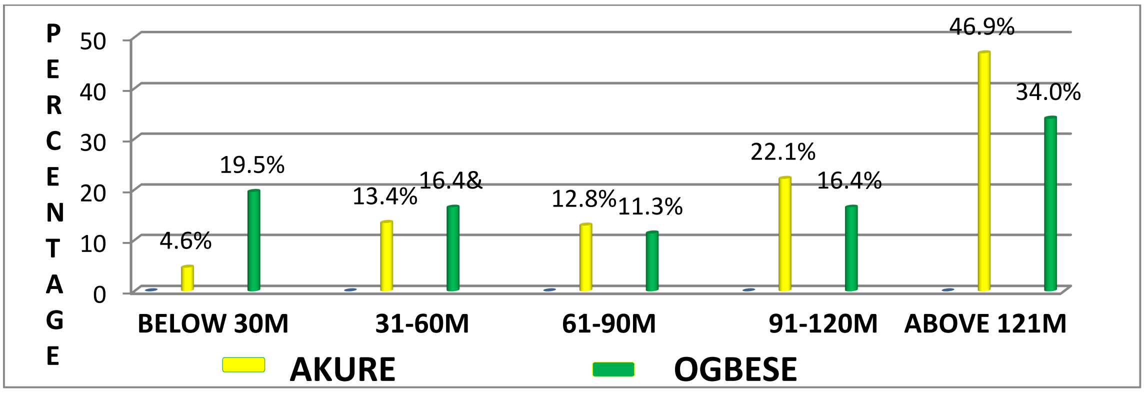
Annual Income (N)	Akure	Ogbese	Total	%
	No. of Respondents	No. of Respondents		
Below 100, 000	106 (54.6%)	63 (66.3%)	**169**	**58.4**
100, 001-300, 000	59 (30.4%)	26 (27.4%)	**85**	**29.4**
300, 001-500, 000	22 (11.3%)	4 (4.2%)	**26**	**8.9**
500, 001 and Above	7 (3.6%)	2 (2.1%)	**9**	**3.1**
Total	**194 (100%)**	**95 (100%)**	**289**	**100**

Source: *Author's Field Work, 2014*

This situation no doubt affects the people's standard of living, their ability to demand for housing and their requirement for other services.

3.1 DISTANCE BETWEEN RESPONDENTS HOUSES AND SAWMILL INDUSTRIES

The findings revealed 24.1% of the sampled residents live within a distance less than 30 meters to sawmill industries as against the 30 meters buffer space standard required in the National Building Code of Nigeria.



Source: *Author's Field Work, 2014*

It is also sad to know that most Sawmill Industries in Ogbese are sited within residential buildings thereby exposing the residents to the various environmental effects generated by the Sawmill activities in this area.

Fig. 1: View of a Residential Building sharing boundary with a Sawmill At Roadblock

This is an example of residential building whose distance within sawmill industry is less than 30 meters, this building is highly polluted and has social, economic and health costs to Residents. The high level of pollution and its attendant impact on residents questions the tenets of Zoning.

Source: *Author's Field Survey (2014).*

3.2 QUALITY OF LIFE AND HEALTH STATUS

The ultimate aim of this sub-section is to know the level of exposure of individuals to disease pathogens and the corresponding effects on their health status as a result of exposure to sawmill Waste within their neighbourhood. The disease pathogens are something like bacterium and virus that can cause disease. These disease pathogens are transmitted through air and water; through common insects and pests; through physical contact with physical materials like wall or dusty ground; and even through human beings.

The Distance within Sawmill industry and Residence (DSIR) was correlated with Frequency of Environmentally Induced Diseases (FEID) the distance within residential building and Sawmill Industry form the variables which were correlated with each of the FEID in order for relationship to be ascertained. The selected variables are:

Distance within Sawmill industry and Residence (DSIR)	**Frequency of Environmentally Induced Diseases (FEID)**
Less than 30 meters	Frequency of Cough
31-60 meters	Frequency of Catarrh
61-90 meters	Frequency of skin Infection
91-120 meters	Frequency of Malaria
121 meters and above	Frequency of dysentery
	Frequency of typhoid
	Frequency of Worms
	Frequency of Acute Diarrhea
	Frequency of Body weakness
	Frequency of measles
	Frequency of Tuberculosis
	Frequency of Sleeplessness

The decision of whether to accept the null hypothesis and reject alternate hypothesis or otherwise is based on the value of the asymptotic significant value of the chi-square statistics. If value is less than a particular critical limit, then the statistic is significant at that critical limit.

Table 4: Distances within Residential Buildings and Sawmill Industries and Prevalent Diseases

Diseases	Chi-squared (X^2) value	Asymptotic significance	Remarks
FCOUGH	34.208	.001**	Reject null
FCATARRH	79.876	.000**	Reject null
FSKINFECT	38.578	.000**	Reject null
FMALAR	194.087	.000**	Reject null
FDYSENT	79.429	.000**	Reject null
FTYPHOID	27.512	.001**	Reject null
FWORMS	15.712	.401	Accept null
FACDIARR	28.090	.000**	Reject null
FBDWEAK	8.574	.199	Accept null
FMEASL	14.975	.092	Accept null
FTUBER	21.944	.038*	Partial
FSLEEP	36.550	.000**	Reject null

Source: Author's Field Work, 2014.

$* p \leq 0.05$. i.e., X^2 is significant at 0.05 alpha level, $** p \leq 0.01$. i.e., X^2 is significant at 0.01 alpha level

From the data analysis shown in Table 4, at critical limits of 1% and 5%, the null hypothesis was rejected for eight (8) variables implying that;

"*Distances within residential building and sawmill dose significantly affect the* prevalent diseases in the study areas"

The variables concerned are; FCOUGH (Frequency of cough), FCATARRH (Frequency of catarrh), FSKINFECT (frequency of skin infection), FMALAR (Frequency of malaria), FDYSENT (Frequency of dysentery), FTYPHOID (Frequency of typhoid), FACDIARR (Frequency of Acute Diarrhea), FSLEEP (Frequency of Frequency of Sleeplessness).

Contrariwise, the null hypothesis was accepted for three variables at both 1% and 5% critical limits implying that;

"*Distances within residential building and sawmill dose not significantly affect the* prevalent diseases in the study areas"

In this case the concerned variables are; FWORMS (Frequency of worms), FBDWEAK (Frequency of body weakness) and FMEASL (Frequency of measles).

And lastly, only one variable have the partial status and the variable is FTUBER (Frequency of tuberculosis). The null hypothesis is accepted at 1% critical limit but rejected at 5% critical limit.

3.3 MODE OF WASTE DISPOSAL IN SAWMILL INDUSTRIES IN THE STUDY AREA

Table 5 shows the various methods of waste disposal practices in the sawmill industries in the study areas, and the result shows that none of the sawmill industries in both study areas recycle their waste.

Table 5: Waste Management Practices by Sawmill Industries in the study area

Mode of disposal	Akure		Ogbese	
		Percentage %		Percentage %
Re-use	NA	NA	NA	NA
Burnt	6	75	3	100
Open space dumping	8	100	3	100
Organized collection	3	37	NA	NA

Source: *Author's Field Work, 2014.*

3.4 WASTE GENERATED BY SAWMILL INDUSTRIES IN THE STUDY AREAS

There are 28 sawmill industries in Ogbese while we have 53 sawmill industries in Akure. Each of the mills has at least one sawing machine and some have as many as three machines. A minimum of 10 logs are being sawn per day per mill (i.e. 9,150 logs per week of six working days). Neal estimated the waste of wood industries to be one third of the total weight of wood being processed, [12], [13]. The minimum girth (or diameter) of the log that can be fell and brought to the study areas for processing is 1.126m. [14].

1. Volumes of each of the logs, before conversion was carried out each day, were obtained using Newton's formula.

$$V_1 = \pi (db_2+4dm2+ds2)\ L/24$$

Where,

V_1 =volume of log (m^3)
db = diameter at the large end of log
dm = diameter at midpoint of log
ds = diameter at small end of the log
L = Log length (m)
π = 3.142 or 22/7

Therefore, a particular log of wood with the following parameters

db = 6 ft ……………………………1.829m
dm = 5 ft…………………………..1.524m
ds = 4 ft…………………………...1.219m

$$V_1 = 3.142\ [(1.829)^2 + 4(1.524)^2 + (1.219)^2] \times 3.658/24$$
$$= 3.142\ [14.307]\ 0.1524$$

Volume of log = 6.760m^3

Using mathematical method of differentiation and keeping dm^2 constant, the lumber of highest volume that can be obtained is of the dimension 12 by 1 by 1

2. Total Volume of various dimension of lumbers obtained per day from timbers in 1 above is obtained using:

$$V_2 = [LxBxH]n$$

Where,

V_2 = Volume of sawn lumbers (m^3)
L = Length (mm)
B = Breath (mm)
H = Thickness (mm)
n = Total number of lumbers obtained.

Therefore: L = 12…………..(3.658m)
B = 1………… …(0.304m)
H = 1…………….(0.304m)

Therefore:

$$V_2 = 3.658 \times 0.304 \times 0.304$$
$$= 0.338m^3$$

Note: this is just for a single number generated. According to the standard wood data book, a log of such measurement should produce approximately 12 pieces of lumber with the above dimension.

Total volume of lumbers = 0.338 x N

Where N = 12

$$V_2 = 0.338 \times 12$$
$$V_2 = 4.056m^3$$

3. The total volume of wood waste generated per day from the conversion of timbers to lumbers is estimated using:

$$Vw = V_1 – V_2$$

Where,

Vw = volume of waste (m^3)
V_1 = Volume of round logs before conversion (m^3)
V_2 = Volume of lumbers obtained after conversion (m^3).

Therefore:

$$Vw = 6.760 – 4.056$$
$$Vw = 2.704m^3$$

4. The percentage waste is therefore calculated using the formula

$$\% \text{ waste} = \frac{Vw}{V_1} \times \frac{100}{1}$$

Therefore:

$$= \frac{2.704}{6.760} \times \frac{100}{1}$$
$$Vw = 40\%$$

The volume of waste is 40% of the total volume of log converted to lumber.

In a day, sawmills in Akure converts a minimum of 1,022 logs of wood which generates approximately 408.8 tons of waste, and this will equally amount to about 2445.2 tons of waste per week. While in Ogbese sawmills converts a minimum of 503 logs of wood per day which will also generates approximately 201.2 tons of waste and 1207.2 tons of waste per week. This is enormous for a town that can hardly cope with its domestic waste. It is therefore, not surprising that these waste accumulate year after year with propensity to increase as the demand for wood increases.

TABLE 6: Logs Converted in each Sawmill in the Study Areas

S/NO	INDUSTRIAL CORRIDORS	AVERAGE NUMBER OF LOGS CONVERTED/DAY	AVERAGE NUMBER OF LOGS CONVERTED/WEEK	AVERAGE VOLUME OF WASTE GENERATED/DAY (M^3)	AVERAGE VOLUME OF WASTE GENERATED/WEEK (M^3)
			AKURE		
1	ONDO ROAD	579	3474	231.6	1389.6
2	ROAD BLOCK	254	1524	101.6	602.4
3	ADO ROAD	70	420	28	168
4	OKE-ARO	78	468	31.2	187.2
5	ODA ROAD	41	246	16.4	98.4
			OGBESE		
6	AYADE OGBESE	340	2040	136	816
7	OKE-ODO OGBESE	163	978	65.2	391.2
TOTAL		**1525**	**9150**	**610**	**6660**

Source: *Ondo State Forestry Department (2013); Updated by the Researcher.*

The sawmill industries presently incinerate some of these wastes as a way of getting read of the huge waste accumulated within her vicinity. The burning is carried out as crudely as possible, thereby introducing air pollution into the already polluted environment.

Fig. 2: Accumulated Waste in the Sawmill Industry in Ogbese

with unorganized waste dump such as this; the sawdust, wood shavings, wood off-cuts and even the logs yet to be converted provide a good environment for the breading of worms, rodents, insects such as flies, crickets, bees, beetles, mosquitoes etc. this of cause is responsible for the prevalence of malaria that is caused by mosquitoes which is prevalent in the study area.

Source: *Author's Field Survey (2014).*

3.5 Direct Observation

Based on direct observation, one could see that exposure to hazardous conditions reduced with distance from the sawmill industries. Field findings also revealed in Ogbese, all residents located in the North-East zone are affected by sawmill pollution especially air pollution as the South-West wind blows across the Sawmills and unfortunately majority of the sawmill industries in Ogbese are located in the South-West zone of Ogbese.

Findings reveal that there is an existing Master Plan for Akure while that of Ogbese could not be established. It was assumed that Ogbese has no Master Plan, this could be linked with the reasons while sawmills are sited within residential areas and half-hazards. Though Akure has a Master Plan, it was noticed that there has been a deviation from the existing Master Plan.

4 Recommendation

Inadequate environmental management attached to the diverse and complex activities within the Urban Centre is resulting into environmental problems that are threatening the dwellers, [15]. These include the haphazard locations of industries and emissions of hydrocarbon and poisonous gases that are depleting the ozone layer as well as causing climate change and global warming. In other to ameliorate these problems the following recommendations are made;

4.1 Improve Conversion Method

The research shows that averagely, 1,525 logs were worked on daily in the study areas which generate averagely about 610m3 of waste per day. However the quantity of wood waste generated can be reduced with improved conversion method.

4.2 Use of Conveyor Belt

The study confirm that about 40 - 50% of logs converted in sawmills comes out as waste. This means that equal volume of sawn timber or log derived is regarded as wastes which comes out in form of sawdust, chips, slabs, edgings, trim-ends, off-cuts, shavings, peeler cores, veneer, etc. in-view of this the use of conveyor belt to collect the waste is necessary in order not to hinder the sawmilling, plywood and veneer processes.

4.3 UTILIZING THE WASTES

The waste yield from the sawmill industry is about one third of the whole of the material involved. The fundamental difficulties in utilizing this waste is the economics of collecting adequate quality of waste to justify the installation of an additional processing plants that can utilize the waste.

***Sawmill Wastes as Fuel*:-** it can be used to produce banquet fuel for cooking. Sawmill wastes are highly combustible, most especially if they are dry. The most combustible wood fuel is charcoal and followed closely (in descending order) by dry soft wood material (e. g. sawdust pellets, planer shavings etc.)

Chip / Particle Board:- Another way of utilizing wood waste is in the manufacture of chipboard or wood-particle board. Saw dusts and wood off-cuts can be separated from other waste at source. The wood off-cuts and rejects are crushed to make chips and mixed in turn with sawdust. Binders, such as resins, are used as to bind the particles together. The mixture is then poured into appropriate moulds to form any desired board size.

Litters:- Wood wastes could be used as litters for animals. Since they are easily available, affordable and disposable, it could serve as better alternatives most especially in the poultry.

Soil Conditioner:- Wood wastes compost, mulch and soil conditioners are useful in Nigeria and sub-Sahara Africa. The wood wastes can have a good use in this area.

4.4 MAKING THE INDUSTRIES PAY (POLLUTER PAY PRINCIPLE)

The society will be better off, if the polluter is held liable for the losses he imposed on others. Because of self-interest, he will not want to adjust his activity but if we measure the gains and the losses involved using a measure common to both (i.e. money). Those who gain receive benefits, for which they are willing to pay, while those who lose suffer a cost, which they would receive as compensation, [16].

4.5 INCENTIVES BY THE GOVERNMENT

Government can help the industries by providing certain incentives. Since the volume of waste generated is enormous, and the industries are more concerned with their economic activities, the government can offer to cart away the wastes to land fill sites and incinerators at subsidized rates. Government can also encourage cottage industries that will utilize the wastes. This will empower the people economically and create jobs as well.

4.6 RELOCATION

It is recommended that the sawmill industries should be relocated if there should exist a friendly and inviting residential area, there should be a buffer between them. This is due to the fact that the two land uses cannot complement each other rather they contradict each other because residential land use cannot be used alongside with industrial land use due to the heavy pollution discharge from the industry (Sawmill)

5 CONCLUSION

All over the world, corporations locates their polluting factories, toxic dumps, and other dangerous projects close to people who are most oppressed by poverty and low status; worst still they are deprived of basic infrastructure. Low income earners constitute a significant percentage of population for whom physical developments plans are made; however, more often than not they become victims of the costs (burdens and hazards) of proposed and or implemented land use(s). Poverty is one of the greatest problems militating against development in the high density areas as poverty simply connotes deprivation. Unlike medium and low density areas, high density population live in substandard houses, lack basic infrastructure and amenities especially good roads, health care facilities and potable water amongst others. This explain the reason while Ogbese is most hit by the negative impact of the operation of sawmill industries in the two study areas examined.

To a large extent, cases of environmental discrimination remain traceable to the negligence and or ineptitude of professionals charged with the responsibility of ensuring that people have effective, efficient and unrestricted access to a safe, healthy and functional environment. Ideally sawmill industries are not supposed to be sited within residential areas rather they auth to be localize in a given zone probably outskirt the residential areas.

Finally, sawmill wastes such as wood off-cuts, sawdust, back peals etcetera are not all hazardous in term of all of its economics importance. Only it should be probably managed in other not to arm man and is environment. In addition to this, sawdust has a limitless range of uses in society. For example its uses as source of fuel, in making asbestos, veneers, mosquito coil, and others makes it an important waste product in environment..

It was discovered that lack of representation and participation in the key decision making processes, political interference, poor funding of physical planning establishments, dearth of technical personnel and working equipment as well as a near absence of easy-access information and technical assistance contribute to the inability of physical planners to curb Indiscriminate sitting of industries in minority and low-income communities.

REFERENCES

[1] World Bank, (2006): Solid Waste Management Strategies for Developing Countries: Draft report, World Bank 2006 (pp.9-19)

[2] Awake, (2003): "Who will Save the Rain Forest" Watch Tower Bible and Tract Society of Pennsylvania, June 22, 2003, Vol. 84, No. 12, Pp. 3-11.

[3] 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*. (pp.91-120)

[4] Odewunmi, S. G. (2002); "Solid Waste Transportation in Lagos State: Developing a Sustainable Model". PhD. Seminar,University of Lagos, Lagos. Nigeria.

[5] Aina, O. M, (2006) wood waste utilization for energy generation. Proceedings of the International Conference on Renewable Energy for Developing Countries. http/eere.edu/Aina.pdf Date downloaded; 1st August 2009

[6] Dosunmu, O.O., Ajayi A.B. (2002) Problem and management of sawmill waste in Lagos, Proceeding of International Symposium on Environmental Pollution Control and Waste Management, Tunis (EPCOWM 2002), PP 271-278.

[7] Lucas, E.B, (1984), "Improving Lumber recovery from a Live-Sawn Log in the Nigerian Sawmill Situation Using a computer Programme" the Nigerian Journal of Forestry pp. 27-39.

[8] Ondo State Government (ODSG) Ondo State Government News Watch Bulletin September Edition pp. 8 (2010)

[9] Okoko. E, (2001) Qantitative Techniques in Urban Analysis: published by Kraft books limited 6A Polytechnic road, Sango, Ibadan. (pp. 20-35)

[10] Olujimi. JAB (2011) From Rural to Urban: The Nigerian Physical Planning Dilemma - Inaugural Lecture delivered by Prof. Julius Ajilowo Bayode Olujimi at the Federal University of Technology, Akure.

[11] World Bank, (2006): Solid Waste Management Strategies for Developing Countries: Draft report, World Bank 2006 (pp.9-19)

[12] Neal, A. W. (1974), "Formation and use of industrial By-products: A guide". Business books Ltd, London, pp 56-59.

[13] Dosunmu, O. (1998), "Emission Inventory for Lagos City, 1980 – 2010". Journal of the Nigerian Society of Chemical Engineers, 17 (1&2); pp95-102.

[14] Joseph A.F. (2001), "The Impact of Forest Industries and Wood Utilization on the Environment. Journal of Tropical Forest Resources Volume 17 © 2001 pp 78-100

[15] Olujimi. JAB (2011) From Rural to Urban: The Nigerian Physical Planning Dilemma Inaugural Lecture delivered by Prof. Julius Ajilowo Bayode Olujimi at the Federal University of Technology, Akure.

[16] Holmes, N. (1976), "Environment and the industrial society". Holder and Stoughton Publishers, Great Britain, pp. 169-180.