

Assessment of Plank Market Environment in Relation to Solid wood Waste Generation and Utilization in Lagos, Ogun and Oyo States



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Abstract

The volume of activities in nowadays plank markets had attracted the need to appraise the impact of solid waste generated on the plank market environment. A preliminary approach is to first evaluate the nature and status of this category of waste. This study investigates the characteristics of solid waste generated at selected plank markets at Lagos, Ogun and Oyo States, Nigeria. An on-the-spot assessment of the solid waste generated at 18 different plank markets randomly selected from the three States was conducted. Preliminary data were collected on type of solid waste generated, their characteristics, disposal means and utilization status using oral interview, structured questionnaire and parameters measurement as survey tools. Findings shows that the solid wood wastes generated were back, off-cuts, mis-manufacture, sawdust and wood shavings in increasing order of generation respectively. It was observed that an average of 25,500.40kg/day, 29,318.6kg/day and 32,960.71kg/day of solid wood waste is generated in Oyo, Lagos and Ogun state respectively. None of the States involved in this study has robust management plan for solid wood waste generated in plank markets in their domain. Only off-cut, mis-manufacture and wood shavings attract little economy value offered by users who utilized them for various traditional purposes. This study established that the solid wood wastes generated in large volume at the Lagos, Ogun and Oyo States plank markets are not currently properly managed and may poses negative impact on people, animal and environment.

Keywords: Plank market, Solid waste, Wood waste, Characteristics

Introduction

Natural resources such as wood are most often processed to meet diverse needs of man and its environment. Tree is one of the nature's free gifts to mankind that has been extensively exploited to meet man's need (Lucas *et al*, 2006). Trees are processed primarily into lumber for further use as versatile raw material for structural and non-structural use (Adewole and Bankole (2014)). Wastes are generated during extraction and processing of raw materials into intermediate and final products, consumption of the products and other human activities (Dosumu and Ajayi, 2002; Sridhar and Hammed, 2014). The waste so generated from such has great potential to negatively impact on the environment if not properly managed. Plank market is such a market where requirements and the operational environment are changing rather rapidly because flexibility is one of the key drivers for business success. Flexibility in this context is driven by supply and demand factors. Business activities at plank market is therefore a potential contributor to generation of solid waste which if not properly managed may lead to high levels of pollution and dissipation of natural resources (Ukem, 2008; Wilson *et al*, 2006). Solid wood waste generated at plank market will include all the left-over arising from all activities involved in plank reprocessing because they are designated as valueless (Oyelola *et al*, 2009). But, solid waste irrespective of its type has potential

re-used value (Sridhar & Adeoye, 2003; Sridhar and Hammed, 2014). A desirable option for solid wood waste generated at the plank market would be to either re-cycled or adds value to make them re-use able. Otherwise they will constitute health hazards in not timely disposed (Dosunmu and Ajayi, 2002; Ajayi, 2008). It is for this reasons that this study was designed to investigate the type, volume, characteristics of solid wood waste generated at the selected plank markets in Lagos, Ogun and Oyo States as well as documenting the current management means in these study location.

Materials and Methods

The study utilized USAID (2010) approach to stratified each of the considered Local Government Areas in Lagos, Ogun and Oyo States into urban, semi-urban and rural areas. Six Plank Markets 'PM' each were randomly selected from each of the States as indicated in Table 1 to generate a total number of 18 PM involved in the study. Demographic data of plank sellers, machine operators and other ancillary workers at the selected PM were collected. Preliminary information on the type of solid wood waste generated, their characteristics, current means of disposing and utilization status were gathered using oral interview, structured questionnaire and parameters measurement as the survey tools. The data was analysed using both descriptive and quantitative statistical method.

Table 1: Plank Markets, Local Government Areas, State and Status

S/N	Plank Markets	Location (LGA)	State	Status
1	Orisunmibare PM	Ibadan North	Oyo	Urban
2	Temidire PM	Ibadan North East	Oyo	Urban
3	Challenge PM	Ibadan South West	Oyo	Urban
4	Moniya PM	Akinyele	Oyo	Semi-urban/Rural
5	Olorunsogo PM	Egbeda	Oyo	Semi-urban/Rural
6	Olorunda PM	Oyo central	Oyo	Semi-urban/Rural
7	Awori PM	Abuleegba	Lagos	Urban
8	OdoEran PM	Ikeja	Lagos	Urban
9	Adebams and Orilonise PM	Lagos Island	Lagos	Urban
10	Jolasko PM	Akute	Lagos	Semi-urban/Rural
11	Obaja PM	Omole	Lagos	Semi-urban/Rural
12	Irewolede PM	Alagbado	Lagos	Semi-urban/Rural
13	Lafenwa	Abeokuta north	Ogun	Urban
14	Kanjun PM	Abeokuta south	Ogun	Urban
15	Iporoake	Abeokuta south	Ogun	Urban
16	Ikenne	Remo north	Ogun	Semi-urban/Rural
17	Iperu	Remo south	Ogun	Semi-urban/Rural
18	Omoowo	Ijebu north	Ogun	Semi-urban/Rural

Results and DiscussionDemographic Characteristics of the Selected PM

Plank markets in the study areas play host to enormous wood conversion activities. The business of plank selling and re-processing is a male dominated work with an average ratio of 4:1 for male to female involvement in the three states. Although, Oyo State has the largest population of people involved in plank business at the selected PMs, an average of 8700 people are engaged in plank business at the selected plank markets in each state.

Type, Characteristics and Volume of Solid Wastes Generated at the Selected PMs

The findings from the PMs where investigation was carried out shows that the solid waste generated includes paper, wood back, wood shavings, nylon, sawdust, plastics, jute sack, off-cuts and mis-manufactured wood. The percentage of various wastes generation at the plank markets on the basis of the State where survey was conducted are presented in Figures 1 to 3.

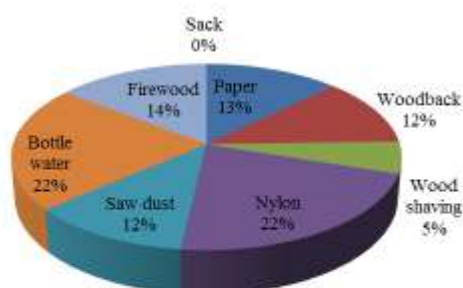


Figure 1: Waste Characterisation in the Plank Markets in Lagos State

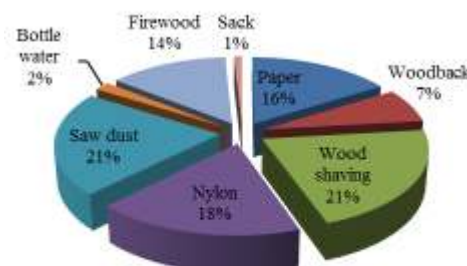


Figure 2: Waste Characterisation in the Plank Markets in Ogun State

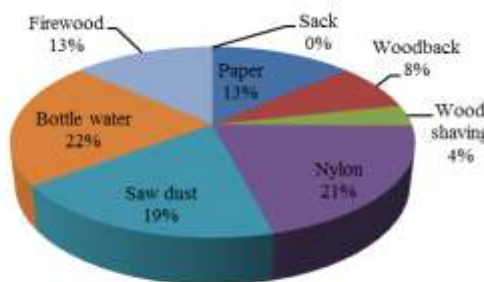


Figure 3: Waste Characterisation in the Plank Market in Oyo State

The solid waste thus generated at the PMs where the survey was conducted can be characterised into two: the solid wood waste and the non-wood solid waste (EPA, 1999). The solid wood wastes are wood back, shavings, sawdust, off-cuts and mis-manufactured. The distributions of how the solid wastes were generated at the PMs involved in the study were presented in Figures 4 to 6. From the on-the-Spot assessment and respondents' submission, sawdust was the highest solid waste generated at the PM irrespective of rural, semi-urban and urban

locations and states where the survey was conducted. It was observed that an average of 25,500.40kg/day, 29,318.6kg/day and 32,960.71kg/day of solid wood waste is generated in Oyo, Lagos and Ogun state respectively. Cumulatively for 6 working days in a week, Oyo, Lagos and Ogun State generates 153,002.4kg, 175,913.16kg and 197,764.26kg volume of solid wood waste respectively. At 5% level of confidence as shown in Table 3, there is significant difference in the solid waste generation between PMs and States.

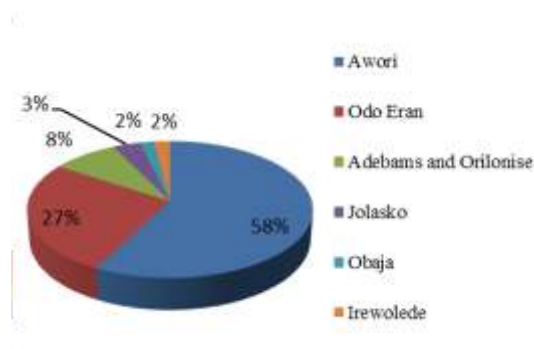


Figure 4: Mass of Wood Waste Generated in Selected Plank Markets in Lagos State.

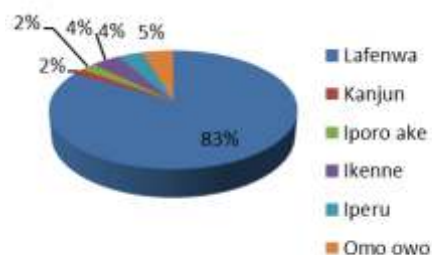


Figure 5: Mass of Wood Waste Generated in Selected Plank Markets in Ogun State.

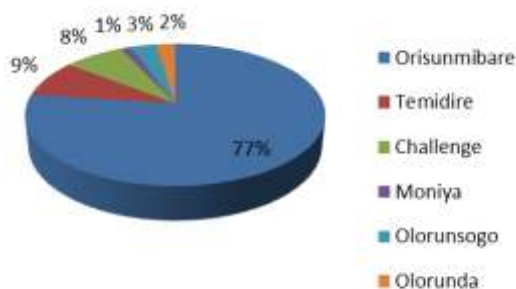


Figure 6: Mass of Wood Waste Generated in Selected Plank Markets in Oyo State

Sources and Uses of the Solid Wood Wastes in Plank Markets

The equipment used for wood processing in all the PM surveyed includes Circular saw, Planning, Tenoning and mortising, Turning, Drilling and Vertical bandsaw machines. Of the entire machines, the planning machine generated the highest solid wood waste,

followed by the circular saw machine. It was observed that waste disposal remains one of the biggest challenges facing the plank market industry in all the states. All the states are yet to develop robust solid waste management plan for solid wood wastes generated in plank market. Result of the assessment on waste disposal method in each States is given in Table 4.

Table 3: ANOVA of Mass of Wood Waste Generated in Selected PMs

Source of Variation	SS	df	MS	F	P-value	F crit
<i>Lagos State</i>						
Days	82253509	6	13708918	1.09	0.39	2.42
Plank markets	7.23E+10	5	1.45E+10	1148.85	2.65E-33	2.53
Error	3.78E+08	30	12587509			
Total	7.28E+10	41				
<i>Ogun State</i>						
Days	1.09E+08	6	18142189	1.13	0.37	2.42
Plank markets	1.46E+11	5	2.92E+10	1822.96	2.69E-36	2.53
Error	4.81E+08	30	16026458			
Total	1.47E+11	41				
<i>Oyo State</i>						
Days	17652437	6	2942073	1.05	0.42	2.42
Plank markets	5.32E+10	5	1.06E+10	3786.116	4.79E-41	2.53
Error	84333796	30	2811127			
Total	5.33E+10	41				

Table 4: Details of Waste Disposal in the Plank Markets at the Study Areas

Method	Lagos State		Ogun State		Oyo State	
	Generated	%	Generated	%	Generated	%
	Waste (tons/ day)		Waste (tons/ day)		Waste (tons/ day)	
Open dumping by bagging	10.3	4.0	282.8	64.3	329.1	75.1
Packing by household	9.0	3.5	31.5	7.2	13.5	3.1
Packing by poultry owner	135.0	52.5	63.0	14.3	40.5	9.3
Landfill	67.5	26.2	45.0	10.2	45.0	10.2
Dumpsite	35.6	13.8	17.5	4.0	0.9	0.2

There are evidences that Oyo Statesituation requires urgent attention. Those who are using some of the wood waste are both individuals and companies who come to pack mostly the wood shavings shown in Plates 1. The rest wood wastes are merely dumped as shown in Plate 2 and ended been burnt without concern for the potential to the plank market environment, workers and people living in the neighbourhood. The most

patronised solid wood wastes like shavings, off-cuts and mis-manufacture are already attracting economic value. Some of the possible uses are still traditional (Olorunda,2006; Sridhar and Hammed, 2014) as shown in Plate 3. Even the wood shavings patronised by poultry companies ended up been used as poultry beddings amongst others. There is no evidence of the solid wood waste generated in all the PMs and in all the states been patronised for modern use.



Plate 1: Individuals and Company Representatives Packing Wood Shavings at PM



Plate2: Solid Wood Wastes Waste Disposal Means at the PMs



Plate 3: Some of the Current Traditional use of Solid Wood Waste in the Three States

Conclusions

Plank market in the study areas generates large quantities of both non-wood and wood solid wastes daily through plank re-processing, ancillary and other human activities that goes on at PM on daily basis. It was observed that an average of 25,500.40kg/day, 29,318.6kg/day and 32,960.71kg/day of solid wood waste is generated in Oyo, Lagos and Ogun state respectively. Cumulatively for 6 working days in a week, Oyo, Lagos and Ogun State generates 153,002.4kg, 175,913.16kg and 197,764.26kg volume of solid wood waste respectively. None of the States involved in this study has robust management plan for solid wood waste generated in plank markets in their domain. Only off-cut, mis-manufacture and wood shavings attract little economy value offered by users who utilized them for various traditional purposes. This study established that the solid wood wastes generated in large volume at the Lagos, Ogun and Oyo States plank markets are not currently properly managed and may poses negative impact on people, animal and environment. There is need for the state to develop means of disposing the solid wood wastes generated in their domain with the situation in Oyo State calling for urgent attention. There is also need to carry extensive study on the implication of the current means of waste management on the plank market environment.

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