# MAJOR CONSTRAINTS HINDERING THE MANAGEMENT OF OCCUPATIONAL HAZARDS IN WOOD PR `OCESSING INDUSTRIES

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## Abstract

Many activities such as glue making, paper making, wood turning, upholstery platform, logging activities, fuel processing activities and furniture making are carried out in wood processing industries but some constraints tend to affect the management of occupational hazards in such industries. This study was designed to identify the major constraints hindering the management of occupational hazards in wood processing industries. This study adopted a survey research design. The instrument used for the study was questionnaire. Mean, Standard deviation and ANOVA test statistics were used to analyse the data for the study. 25 items were identified as the major constraints in both primary and secondary wood processing industries**.** The reliability coefficient of the instrument was determined using Cronbach alpha (α) internal consistency. There was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in secondary wood processing industries. Recommendations include among others that government and management levels should endeavour to identify the major constraints hindering the management of occupational hazards in wood processing industries.

**Keywords: Constraint , Primary Wood Processing , Secondary Wood Processing, Management, Occupational Hazards**

## Introduction

Constraints refer to factors that hinder the achievement of any activity. There are many constraints to the solution of safety and health problems of workers in wood processing industries. Many constraints exist in various occupations in wood processing industries where risks of occupational accidents and diseases are particularly high. The constraints in wood processing industries could be attributed to many factors such as inadequate safety, health of the workers, skill shortages, road and sea transport costs, non-tariff barriers and market pressure from wood substitutes. These factors could debar workers to have efficient wood processing activities in the industries as a result of inadequate management of wood processing activities which could lead to injury , wound and infection .When an individual gets involved in an accident during wood processing activities according to Okorie (2001), the employee sustains losses through cost of time of injured workers, hospital treatment and cure of the injured worker, time lost by foremen, supervisors or other executives in assisting injured employer, investigating the cause of the accident giving reports to the police, cost due to damaged materials tools or equipment and cost due to death benefits or worker's disability compensation, lack of good management of wood processing industries. Management according to Ibukun (2005) is the process of planning, organizing and controlling an organization's operations in order to achieve a co-ordination of human and material resources essential in the effective and efficient attainment of objectives.

The wood products industries are undergoing rapid technological changes because they differ from one country to another and from the product to another which the craftsmen can now apply.

Wood processing industries could be classified into primary and secondary wood processing. Primary wood processing means the production of logs and related products into timber, veneer and other related products like ice –cream sticks while secondary wood processing is usually considered to be the addition of value to wood beyond the stage of boards or veneer (Irland and Murdoch, 1992). Secondary wood processing is also important in paper because it involves the addition of some chemicals before the production could complete.

The addition of value to wood involves various processes to change the shape of various wood products. The processing of logs into timber, paper and other value added products using various machines begins with the processing of standing trees into felled trees and logs that are input requirements of the various wood processing industries. Value added processing of products such as furniture may involve several manufacturing stages including drying, planing, moulding, sanding and or staining (Monserud, Lowell, Becker, Hummel, Donogbue, Nicholis, Roos and Cantrell, 2004). Wood processing involves the peeling, slicing, sawing and cutting of hard and soft woods to form finished products such as veneer, plywood and board. The first processing operation is carried out by the loggers. The loggers are prone to hazards due to the risky operation that are carried out at the logging site. Workers could be exposed to hazards such as airborne of wood dust of different particles from the felling stage of trees to the final manufacturing procecesses.

Some wood processing industries especially secondary wood processing could produce different kinds of products as a result of shortage of materials with obsolete or badly serviced plant, which could lead to the rejection of finished products by the society. Wood processing refers to the production of timber based resources such as iroko, mahogany, obeche, abura, opepe, teak, mansonia and iron wood into products such as construction materials, chairs , tables, dining tables and doors. (Olaoye & Ogunmilade, 2014). There are many machines that are used to process wood

in primary and secondary industries. These include logs splitters and fire wood processors. Others include jig saw, radial saw, wood turning lathe, thickneser, planner, jointer or hand planer, sanding machine, circular saw, band saw, drilling machine, moulding or wood shaping machine, mortising machine and portable machine (Ragbuwanshi, 2008). The different operations performed in wood working can be summarized as follows: marking and laying out, sawing, planing, mortising, tenoning, boring, moulding, grooving and tonguing, rebating and recessing (Ragbuwanshi, 2008). Many hazards such as point of operation hazards, kickback hazards, could occur during processing activities such as furniture making in industries .Occupational hazards refer to working conditions of a job that are risky.(Woodbury in Olaoye and Ogunmilade 2014). To avoid hazards, safety should be a paramount importance to the workers in industries. Safety is an attempt to avoid hazards (Ede, 2001).Safety is an essential mechanism for machine operators by drawing lines around the machines in an attempt to prevent hazards in wood processing industries.

The operators could put the designed wood products for practical use using the necessary tools and equipment. Wood is designed to efficiently perform its functions. The most important aspect of wood design is the efficiency (David, 1980). The products could be sold to consumers by the timber sellers after being machined. Timber sellers are the people who offer different species of timber such as mahogany, iroko and mansonia for sale in wood processing industries. Some wood processing industries could employ salesmen to sell their products .The salesmen primary function in wood processing industries is to make sales by creating valuable solution and communicating the necessary information that encourages buyers to achieve their goals.

Wood processing industries are the organizational set up that make use of forest products to produce various categories of wood products such as chairs, tables, upholstered chairs and paper for human consumption. Wood industries could be considered to be one of the most dangerous

manufacturing industries for workers because they deal with sophisticated machines .With the use of machines for various wood processing activities, some operations are very hazardous which could lead workers to loss of fingers, legs and sometimes to death.

Workers in wood processing industries such as sawmills are at the risk of developing cancer and lung diseases due to their exposure to wood dust and other substances during wood processing activities.. Workers could also be exposed to hazards ranging from logging operations to where the woods are processed into products such as paper ,tables and chairs. The workers could contact diseases through occupational exposure to wood dust and other substances connected with wood processing. Workers exposure to toxic chemicals or harmful levels of noise or radiation may happen in conjunction with routine work as well as by accident in wood processing industries.

Constraints to these hazards are many. These depend on the technical compatibilities possessed by the workers, scale of operations and identification of technological advancement needed to process the available materials in wood processing industries.

The general purpose of this study was to identify the major constraints hindering the management of occupational hazards in wood processing industries.

The following research questions were formulated to guide the study

1 What are the major constraints hindering the management of occupational hazards in primary wood processing industries?

2 What are the major constraints hindering the management of occupational hazards in secondary wood processing industries?

Two null hypotheses were tested at 0.05 level of significance

$Ho_1$ There is no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in primary wood processing industries

$Ho_2$ There is no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in secondary wood processing industries

## Methodology

This study adopted a survey research design. The States are Ekiti, Lagos, Oyo, Ondo, Osun and Ogun states. The population for the study comprised all the 7,110 workers in wood processing industries in South-West Nigeria.,. The sample of the study consisted of 711 workers in wood processing industries. Stratified random sampling technique was used to determine the sample for the study. The workers in wood processing industries were stratified based on the various categories of wood products. These include sawmill industries, furniture industries, cardboard industries, paper industries and glue industries

The sample was selected from the entire population of 7110 workers in wood processing industries in South-West Nigeria. Uzoagulu (2010) suggested that the population up to 1000, use 20%; for 5000 use 10 %; for up to 10000 use 5%. The population of the study was not up to 10000.

Therefore, 10 % of the entire population was used to determine the sample for the study. Then, the sample was determined by multiplying each group size by the sample size and dividing the result by total population size.

Sawmill Industries (6000 X 711/ 7110) = 600

Furniture Industries (450 X 711) / 7110) = 45

Card Industries (240 X 711) / 7110) = 24

Glue Industries (200 X 711) / 7110) =20

Paper Industries (220 X 711) / 7110 = 22

The sample of 711 workers consisted of 600 sawmill workers, 45 furniture industry workers , 24 cardboard industry workers, 20 glue industry workers and 22 paper industry workers

The instrument used for the study was questionnaire. The instrument contained 28 items. The instrument was face validated by three experts in industrial technical education in the Department of Vocational Teacher Education, University of Nigeria, Nsukka and two specialists in wood processing in Ekiti State. **T**he reliability coefficient of the instrument was determined using Cronbach alpha (α) internal consistency. The following are the coefficients obtained from the two sections of the instrument 0. 8477 (constraints to the management of occupational hazards in primary wood processing industries) and (0.8654) constraints to the management of occupational hazards in secondary wood processing industries. The instrument for data collection was administered by hand to the wood processing workers in South-West Nigeria by the researcher and research assistants. 711 copies of the questionnaire were administered and 662 copies were collected back. The collected copies yielded 93.1 per cent of the total copies of the questionnaire distributed to the respondents

Mean, Standard deviation and ANOVA test were used to analyse the data from the study. The mean and standard deviation were used to interpret the two research questions. The ANOVA test was used to test the hypotheses ($Ho_1$, $Ho_2$) at 0 .05 level of significance. The mean and standard deviation of each item of the distribution on a five- point likert scale were calculated and used to determine the major constraints on the management of occupational hazards in wood processing industries in South-West Nigeria. The likert scale has five levels, namely: Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD). Each level is assigned a number ranging from 5(SA) to 1 (SD).

The real limit is 3.0 while the lower and upper limits of 3.0 are 2.50 and 3.49 respectively. Therefore, any mean rating from 3.50 and above was agreed and where otherwise was disagreed.

For the hypotheses, the null hypothesis was accepted if p-value was equal or greater than .05 and rejected if the p-value was less than .05

**Results**

**Research Question 1**

What are the major constraints hindering the management of occupational hazards in primary wood processing industries?

**Table 1**:

**Major Constraints Hindering the Management of Occupational Hazards in Primary Wood Processing Industries**

| S/N | CONSTRAINTS | X | SD | REMARKS |
|---|---|---|---|---|
| 1 | Seedling problems in planting the required trees by wood processing workers | 2.92 | 1.31 | Disagree |
| 2 | Inability to advance in technology and industrialization using modern equipment in processing wood activities | 4.85 | 0.61 | Agree |
| 3 | The logs supplied to wood processing industries from the forest are decreasing in quantity every day | 4.80 | 0.44 | Agree |
| 4 | Inadequate transportation of the logs from the forest to the wood processing industries especially in riverside areas | 4.91 | 0.32 | Agree |
| 5 | Wood is subject to attack by wood inhibiting insects from the standing trees to wood products in serve | 4.47 | 0.86 | Agree |
| 6 | Majority of the public lands have been affected by fires which could destroy small trees | 3.85 | 1.30 | Agree |
| 7 | Forest areas are far away from the saw mills | 4.57 | 0.61 | Agree |
| 8 | Inability of the timber dealers to collect log certificates leads to carrying of the logs in the night | 4.66 | 0.69 | Agree |
| 9 | Inadequate inspection of forest areas by forest guards before and after felling of trees | 4.40 | 0.43 | Agree |
| 10 | There is a problem of selling timber using cubic metre | 4.86 | 0.38 | Agree |

The results of Table 1 show the major constraints hindering the management of occupational hazards in primary wood processing industries.

**Research Question 2**

What are the major constraints hindering the management of occupational hazards in secondary wood processing industries

**Table 2:**

**Major Constraints Hindering the Management of Occupational Hazards in Secondary Wood Processing Industries**

| S/N | CONSTRAINTS | X | SD | REMARKS |
|---|---|---|---|---|
| 11 | Employees and employers in industries do not always show interest on safety | 2.87 | 0.37 | Disagree |
| 12 | Lack of effective control of chemicals imported into this country both banned and restricted ones | 4.88 | 0.37 | Agree |
| 13 | Federal government always imports furniture items from overseas country such as America and China | 4.84 | 0.38 | Agree |
| 14 | Stagnation on one post for a long time without promotion | 2.58 | 1.40 | Disagree |
| 15 | Welfare facilities such as canteens, clinics and shops are not available | 4.70 | **0.63** | Agree |
| 16 | Wood products are costly | 4.25 | 0.54 | Agree |
| 17 | Many furniture makers purchase many parts rather than produce them | 4.85 | 0.53 | Agree |
| 18 | Inability of the government to formulate the appropriate policy for wood based industries | 4.77 | 0.46 | Agree |
| 19 | Inability to provide waste disposal buckets for disposing waste | 4.72 | 0.53 | Agree |
| 20 | There is over reliance of wood processing industries on imported technology | | | |

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|---|---|---|---|---|
| | | 4.59 | 0.61 | Agree |
| 21 | Obsolete equipment in institutions for training of workers for industries | 4.79 | 0.48 | Agree |
| 22 | Promotion in wood processing industries is due to favourism | 3.52 | 1.49 | Agree |
| 23 | Noise from the workers , machines and other external factors hinder the management of occupational hazards in industries | 4.81 | 0.54 | Agree |
| 24 | Production workers do not have technical information such as component of the equipment , its operational principles and maintenance guide | 4.58 | 0.95 | Agree |
| 25 | Inability of the engineers, designers and craftsmen to make profitable use of their leisure time to design suitable products using do it your self system | 4.93 | 0.95 | Agree |
| 26 | Long working hours are planned | 4.24 | 0.56 | Agree |
| 27 | Frequent riots occur due to slave – like treatment of the unskilled workers by the capitalist employers | 4.73 | 0.59 | Agree |
| 28 | Inadequate training and re-training opportunities | 4.11 | 0.15 | Agree |

The results of Table 2 show the major constraints hindering the management of occupational hazards in secondary wood processing industries.

**Hypothesis 1**

There is no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in primary wood processing industries

Table 3: Summary of Analysis of Variance (ANOVA) test of the Mean Ratings of Timber Sellers and Machine Operators on the Major Constraints hindering the Management of Occupational Hazards in Primary Wood Processing Industries

| Source of variation | SS | Df | MS | F-cal | Sig. | Decision |
|---|---|---|---|---|---|---|
| Between groups | 78.177 | 10 | 7.818 | 1.470 | 4.284 | N/S |
| Within groups | 3462.4 | 651 | 5.319 | | | Accept $Ho_1$ |

---------- S= Significance difference N/S = No Significant difference Df – Degree of freedom

SS = Sum of Squares MS= Mean of Squares

Table 3 shows the summary of all analysis of variance. P- value was greater than .05. Therefore, the null hypothesis $Ho_1$ was accepted. Hence, there was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in primary wood processing industries

**Hypothesis 2**

There is no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in secondary wood processing industries

**Table 4**: Summary of Analysis of Variance (ANOVA) test of the Mean Ratings of Timber Sellers and Machine Operators on the Major Constraints hindering the Management of Occupational Hazards in Secondary Wood Processing Industries

| Source of variation | SS | Df | MS | F-cal | Sig. | Decision |
|---|---|---|---|---|---|---|
| Between groups | 141.228 | 10 | 14.123 | 1.657 | 5.258 | N/S |
| Within groups | 5553.270 | 651 | 8.530 | | | Accept $Ho_2$ |

---------- S= Significance difference N/S = No Significant difference Df – Degree of freedom

SS = Sum of Squares MS= Mean of Squares

Table 4 shows the summary of all analysis of variance. P- value was greater than .05. Therefore, the null hypothesis $Ho_2$ was accepted. Hence, there was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in secondary wood processing industries

**Discussion**

The data presented in table 1 provided answer to research question 1. Findings revealed that 9 items are the major constraints that hinder the management of occupational hazards in primary wood processing industries while one item was not regarded as the major constraints hindering the management of occupational hazards in primary wood processing industries. Constraints in wood processing industries could be attributed to many factors such as skill shortages, non- tariff barriers, market pressure from wood substitutes and sea transport cost. The finding revealed that there is inadequate transportation of logs from the forest to the wood processing industries. The finding supports the findings of Christensen, Julin, Ross and Willins (2002) who said that some trees had little defect so that the logs were not graded.

The finding indicated that there is a problem of selling timber using cubic metre. In support of the finding ,certain things must be borne in mind according to Walton( 1981) who stated that timber merchants may use two methods to work out the cost of a timber order both being based on the volume of the timber in order, which is originally calculated from the price per cubic metre plus extra for re-sawing to standard sizes, seasoning and dressing or milling This could be as a result of deficiency in the mensuration aspects of wood technology which could allow timber dealers to sell their products. This findings revealed that majority of public lands have been affected by fires which could destroy small trees This is in agreement with Monserud et al (2004) who stated that mitigation of fire hazards is becoming the dominant management objective on public lands and many of the proposed treatment removed only small – diameter trees . Fire hazards on the public lands could be managed by planting trees to replace the destroyed ones

The data presented in table 2 provided answer to research question 2. Findings indicated that 16 items are the major constraints that hinder the management of occupational hazards in secondary wood processing industries while two items were not regarded as the major constraints hindering the management of occupational hazards in secondary wood processing industries. The respondents agreed that employees and employer do not always show interest on safety. This finding is consistent with the finding of Ratnasingam, Ioas and Bennet (2010) who stated four determinants of safety climate in the wooden furniture industries as company responsibility, workers safety attitudes, safety supervision and company safety precautions

These factors are facets for improving the health of workers. Management should enforce safety on workers in the industries. The respondents agreed that there are obsolete equipment in institutions for training of workers for industries This is in agreement with the finding of Olaitan (1996) who stated that obsolete equipment are the best one can find in some technical man power productions. The use of

obsolete equipment affects many companies to achieve their objects.

The finding revealed the lack of effective control of chemicals imported into the country both banned and restricted ones. This is in agreement with Adejuwon (2007) who stated that there is lack of effective control of chemicals imported into this country both banned and restricted ones. Chemicals are used for treating wood. The finding revealed that production workers do not have technical information such as components of equipment, its operational principles and maintenance guide. This finding is consistent with OSHA (1993) who stated that main risk control strategies include measures to improving the operational capabilities of an individual such as the provision of new equipment guidance and training. Production workers generally operate specific machines. They can be found in primary industries such as sawmills and plywood mills as well as in secondary industries that manufacture kitchen cabinets, dressing stools and other wood products..

Table 3 revealed that there was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in primary wood processing industries. The findings of this study support the finding of Addai (2002) who stated that environmental problems such as pollution must be addressed in order to protect and maintain a sustainable environment to save it from imparable damage. This is the fact that wood processing industries contain many hazards which need to be addressed to make life comfortable for workers.

Table 4 revealed that there was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in secondary wood processing industries. The finding does not support the finding of Julie and Nicola (2006) who stated that there was significant difference and robust information and common agreement on the portable and the underlying causes of major accidents and incidents in the major

hazards industry. This may be attributed to some measures such as the inability of the workers to recognize the major constraints hindering the management of occupational hazards during wood processing activities. Such measures include welfare activities such as canteens, clinics are not available, inability of workers to advance in technology and industrialization using modern equipment to process wood processing activities

## Conclusion and Recommendations

Many activities such as paper making, cabinet making and furniture making are carried out in both primary and secondary wood processing industries but some constraints such as the employees and employers in industries do not always show interest on safety could affect the attainment of their objectives.

Based on these findings, the following recommendations are made

1 An attempt should be made by the government and management levels to identify the major constraints hindering the management of occupational hazards in wood processing industries. The identification of hazards will help them to determine the control measures.

2 Safety should be an integral part of all the activities that are carried out in wood processing industries. The employers should enforce safety on individual workers in industries

3 Wood processing workers should endeavour to plant trees in order to improve on the logs supplied to industries.

4 An attempt should be made by the government to reduce the amount of money collected for log certificates in order to reduce the activities of carrying logs in the night.

5 Workers such as craftsmen and foremen should be trained in order to improve on productivity in industries

## References


Adejuwon, S (2007, June 2). *2000 die from workplace cancer each year*: Occupational hazard 2. The Punch, p 5

.

Addai, I (2002) .The impact of wood processing industries on the environment in Kumasi Metropolitan Area .School of Post Graduate Studies, Nkrumah University of Science and Technology, Kwame

.

Chritensen, G.A; Julin, K.R; Ross R.J &Willins, S (2002) Volume recovery grade yield And properties of lumber from young growth Sitka spruce and western hemlock *Southeast, Alaska forest products Journal* 52(5); 81-87

David, M (1980) .*Woodwork design and practice*. Britain: Hazel Watsa and Villey Ltd

Ede, E.O.(2001) *Occupational analysis and course construction in industrial technical education*.Nsukka: Gogjiksons Publishers

Ibukun, W.O (2005) *Educational management: theory and practice*. Lagos: Green Line Publishers

Irland, L.C &Murdoch, C.W (1992) *Values added processing in Maine's wood industry: An overview. Orono: University of Maine Agricultural Experiment Station Miscellaneous* Report

Juliet, B & Nicola, H (2006) .*Causes of major hazards incidents and how to improve risk Control, health and safety management:* A review of the existing literature HSL.Science Group

Monserud, R.A; Lowell, E.C; Becker, D.R Hummel.S.S; Donogbue, E.M; Barbour, R.J; Kilburn, K.A; Nicholis, D.; Roos, J & Cantrell (2004) *Contemporary wood utilization research needs in the western United States.* United States: Department of Agriculture Forest Service

Nwachukwu, C.C (1988) *Management theory and practice*. Onitsha: Africana Feb Publishers

Okorie, J.U (2001) *Vocational industrial technical education.* Bauchi: League of Researchers Nigeria Limited

Olaitan, S.O (1996) *Vocational and technical education in Nigeria: Issues and analysis.* Onitsha: Noble Graphic Press

Olaoye, A.O. & Ogunmilade, J.O (2014).Management of occupational hazards in wood Processing industries for sustainable development in South-West Nigeria..*Journal of Nigerian Association of Teachers of Technology* 9(3), 117- 122

OSHA (1993) *Managing workers safety and health.* US: OSHA Office of the Comparative Programmes

Ragbuwanshi, B.S (2008).*A course in workshop technology 7th edition*. India: Educational and Technical Publishers *and Environmental Hygiene* 2(12), p65

Walton, J.A (1981) *Woodwork in theory and practice.* Australasian Publishing Company

**Table 13**: Summary of Analysis of Variance (ANOVA) test of the Mean Ratings of Timber Sellers and Machine Operators on the Major Constraints hindering the Management of Occupational Hazards in Wood Processing Industries

| Source of variation | SS | Df | MS | F-cal | Sig. | Decision |
|---|---|---|---|---|---|---|
| Between groups | 407.919 | 10 | 40.792 | 2.283 | 10.763 | N/S |
| Within groups | 11630.219 | 651 | 17.865 | | | Accept $Ho_4$ |

---------- S= Significance difference N/S = No Significant difference Df – Degree of freedom

SS = Sum of Squares MS= Mean of Squares

The p- values are compared with .05 at the degree of freedom between groups (10) and within groups (651)

Table 12 shows that the p-values were greater than .05 in twenty five items while the p- values were less than .05 in five items. The p-values for items 6, 15, 20, 22 and 24 were less than .05.

Table 13 shows the summary of all items in table 12. P- value was greater than .05. Therefore, the null hypothesis $Ho_4$ was accepted. Hence, there was no significant difference between the mean ratings of timber sellers and machine operators on the major constraints hindering the management of occupational hazards in wood processing industries.