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ASSESSMENT OF SELECTED PHYSICAL AND MECHANICAL PROPERTIES OF CEMENT BONDED BOARD PRODUCED FROM *Gliricidia sepium* (AGUNMANIYE)

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Abstract:
Selected physical and mechanical properties of cement bonded board produced from Gliricidia sepium were assessed. The following board properties were evaluated, water absorption, thickness swelling, water absorption and thickness swelling following accelerated aging, modulus of rupture and modulus of elasticity. The Board formation was based on cement: wood ratio 1:1, 2:1 and 3:1, board densities of 800, 900 and 1000kg/m^3 on dry weight basis. The quantity of cement, particles, and water for the production of each board was weighed, mixed separately and very well in order to prevent the formation of particles lumps. Blended mixture was transferred and formed inside a nominal mould dimension of 650mm in length, 650mm in width and 13mm thickness on a caul plate that was covered with polythene sheet before plywood was laid at the top of the mat. The mean value for water absorption and thickness swelling ranged from 3.06 to 6.99% and 1.40 to 7.51%, respectively. Following accelerated aging test, water absorption and thickness swelling ranged from 3.41 to 8.12% and 3.46 to 15.58%, respectively. The mean values for Modulus of rupture (MOR) ranged from 0.76 to 10.22N/mm^2 while the mean values for Modulus of Elasticity (MOE) of the experimental boards produced ranged from 1800.77 to 5220.60N/mm^2. Water absorption and thickness swelling decreased with increase in board density and cement: wood ratio. After the board had been subjected to accelerated aging, water absorption and thickness swelling of the boards decreased with increase in density and cement: wood ratio. Modulus of rupture and modulus of elasticity increased with increase in board density and cement: wood ratio. Gliricidia sepium was found suitable for the production of cement bonded board.

Key words: *water absorption; thickness swelling; Modulus of Rupture; Modulus of Elasticity.*

INTRODUCTION

Due to increase in the population and economic development, the annual demand and consumption of forest products have been growing very fast. These occurrences have significant impact on the operations of the forest industries leading to a decline in the contribution of the industries to national development. There is dependence on the forest to provide wood raw materials to wood industry and increase in consumption of wood and wood products leads to high exploitation of timber resources in the forest. A decrease in the supply of solid wood products calls for an alternative such as composite panel products manufactured from agricultural waste, low grade wood and cement.

A high proportion of assorted waste is generated through the process of conversion of logs into planks in sawmill. These wastes have been utilized over the years for the production of cement-bonded boards, resin fibre-board and wood fibre composites. The need for the world to fully become environmentally friendly and to fight the sometimes painful instability and resources, couple with the need to make manufactured products more accessible and affordable to consumers have necessitated the application of more effort into processing and production of natural fiber composite. Composite made of natural fiber provides specific strength and specific stiffness as they can compete favorably with glass fiber (Peijs 2000). Natural fibers from cultivated plants such as Flax, Sisal and cotton have been used in a large variety of products from cloths to house roofing. Today these fibers are appraised as environmentally correct materials owing to their biodegradability and renewable characteristics (Bledzki and Gassan 1999). Beside those plant that are cultivated with the main purpose of using the fiber, some other plants fiber has secondary or no commercial interest and is

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usually regarded as a waste. This is the case of most low grade timber which is use mainly as firewood.

The common practice of considering a natural fiber as an undesirable waste, results in its burning or disposal on landfills which contribute to pollution. Therefore, in order to preserve the environment, it is necessary to find economically feasible solutions to the increasing amount of natural fiber wastes. This can be achieved through the understanding of natural fibers as recyclable materials, which could be used for different applications ranging from handicrafts to reinforcement elements for composite materials (Schuh and Gayer 1997).

Gliricidia sepium is a medium size leguminous tree belonging to the family Fabaceae. It is second most important legume tree, surpassed only by *Leucaena leucocephala* (Rani 2007). It is used in many tropical and sub-tropical countries for various purposes such as live fencing, fodder, coffee shade, firewood (Lowe *et al.* 2004), green manure and rate poison (Elevitch 2004). Gliricidia sepium is a fast growing species that takes advantage of slash and burn practices in its native range. Its swift propagation has caused it to be considered as weed in Jamaica. According to world agroforestry centre, this species is becoming an important part of farming practices in Africa.

Cement bonded board (CBB) are wood based panels which are more dimensionally stable under varying relative humidity change. They are a good construction material which are of great importance to mankind and possesses unique qualities over other panel products. This made it more acceptable particularly in less developed countries. The acceptance of CBB is based on its reliability and resistance to fire, insect attack, decay and their perceived performance during natural disasters such as earthquakes and tropical storms (Badejo 1986, Papadopoulos 2008). These inherent properties of CBB made it versatile material for roofing, ceiling board and flooring, partitioning, cladding, and shuttering (Sulastiningsih *et al.* 2000). However, some of the factors influencing the setting of CBB include the use of chemical accelerator, particle geometry and wood cement mixing ratio. These factors play a major role in determining the qualities of CBB and final end uses (Frybort *et al.* 2008). Water soluble chemical substances such as sugars, carbohydrates, hydrolysable tannins and oils present in this lignocellulosic materials which tend to inhibit proper setting of cement when mixed with it are extracted from the wood into the hot water (Aggarwal *et al.* 2008).

GENERAL OBJECTIVE

The main objective was to examine the suitability of *Gliricidia sepium* sawdust for the production of cement bonded board.

Specific objectives were to:

a. evaluate the influence of board densities, cement wood ratio on some selected physical and mechanical properties of boards produced.
b. determine the effect of accelerated aging on physical properties of the composites board produced.

MATERIALS AND METHODS

Materials

The materials used include *Gliricidia sepium*, Ordinary Portland cement and water. *Gliricidia sepium* was felled in a fallow land of the Federal University of the Technology, Akure (FUTA). Four bags of Ordinary Portland cement was purchased from a dealer in Akure. Distilled water was used for the experiment. Equipment used includes wire mesh, cold pressure press, caul plates, wooden mould (650 × 650 × 13mm) and polythene nylon.

Methods

Preparation of raw material

Gliricidia sepium was debarked and processed into sawdust using circular saw machine. The particles were air dried to reduce the moisture content, while particles that passed through the 2.00mm wire mesh were used. The sawdust was pre-treated with hot water at 100^oC for 30 minutes to remove the inhibitory substances that inhibit the setting of the cement used as binder. The pretreated sawdust was air dried for 14 days to reduce the moisture content and then stored in a polythene bag so as to retain the moisture contain prior to use.

Study variables

The corresponding levels in the study were:

1. Cement: wood ratio at three levels: 1:1, 2:1 and 3:1.
2. Board density at three levels: 800, 900 and $1000kg/m^3$.
3. Water: This was computed using the formula adopted by Simatupang *et al*. (1978)

$$Wt = W(0.30 - MC) + 0.60C \quad (1)$$

where:

Wt = Weight of water (g)
W = Oven dry weight of the particles (g)
MC = Moisture Content (%)
C = Cement weight (g)

Constant factor in the production process was:

1. Board dimension: 650 (breadth) × 650 (width) × 13mm (thickness)

Experimental design

The experimental design that was adopted for this study is a 3 x 3 factorial experiment in a Completely Randomized Block Design (RCBD), the combination of which gives 9 treatments, replicated three times.

Table 1

The experimental design for Cement Bonded Board

Board density	***Cement:wood ratio***		
	1:1 (C1)	**2:1 (C2)**	**3:1 (C3)**
800 kg/m^3 (D1)	C1D1	C2D1	C3D1
900 kg/m^3 (D2)	C1D2	C2D2	C3D2
1000 kg/m^3(D3)	C1D3	C2D3	C3D3

Replicated three times
where:

Factor A = three levels of board density: 800, 900 and 1000 kg/m^3.
Factor B = three levels of cement:wood ratio: 1:1, 2:1 and 3:1.
The model for the experiment is:

$$Y_{ijk} = \mu + A_i + B_j + AB_{ij} + \varepsilon_{ij} \quad (2)$$

where:

Y_{ijk} = Individual observation
μ = General mean
A_i = Effect of board density
B_j = Effect of cement:wood ratio
AB_{ij} = Effect of interaction AB
ε_{ij} = Experimental error

Production of Experimental CBB

The production of experimental CBB was based on cement: wood ratios 1:1, 2:1 and 3:1, board densities of 800, 900 and 1000kg/m^3 on dry weight basis. The quantity of cement, particles, and water for each board was weighed, mixed separately and very well in order to prevent the formation of particles lumps. Blended mixture was formed into mat inside 650 × 650 × 13mm mould on a caul plate that have been covered with polythene sheet to prevent sticking of the mixture to the caul plate. Another polythene sheet was placed on the mat before the top caul plate was placed on it. Thereafter, the mat was transferred to a cold press and pressed to 13mm stop with the aid of hydraulic jack. The board was left under pressure for 24 hours, thereafter, the board was removed from the mould and cured in sealed polythene bags, after which it was conditioned under stack for 28 days. The boards produced were trimmed to sizes and test samples for evaluation were cut into various samples sizes for laboratory investigation.

Determination of Physical Properties

Thickness Swelling (TS) and Water Absorption (WA)

Water absorption and thickness swelling tests were determined in accordance with ASTM D570-98 (2005). The dimensions of test specimens used were trimmed to 150 × 150mm. The weights of the specimens were measured, while a digital caliper was used to measure the thickness. The test samples were submerged in distilled water for 24h, thereafter they were removed and drained for 10 minutes to remove excess water. The weight and thickness of the samples were measured and the percentage of water absorption and thickness swelling for each test samples were calculated using the formula below:

Thickness Swelling (TS)

$$TS\ (\%) = \frac{T2 - T1}{T1}\ x\ 100 \qquad (3)$$

where:

TS = Thickness swelling after 24 h water soaking
T_1 = Initial thickness of specimens
T_2 = Thickness after soaking.

Water Absorption (WA)

$$WA\ (\%) = \frac{W2 - W1}{W1}\ x\ 100 \qquad (4)$$

where:

WA = Water absorption after 24 h water soaking
W_1 = Oven dried weight
W_2 = Weight of specimen after water immersion.

Accelerated aging test

Accelerated aging test was carried out to assess the resistance of the board to long term usage or aging process. The test samples were cut to 150 × 150 × 13mm according to ASTM D570-98 (2005) and were subjected to one complete cycle of accelerated aging as highlighted below:

i. Immersed in water at 30°C for 48h
ii. Stored in freezer for 24h
iii. Oven dried at 60°C for 1h
iv. Exposed to boiled water for 1h.

After the completion of these intensive treatments, samples were drained of excess water for 10 minutes. Thereafter, the weight and thickness of the samples were measured and determined. The percentage water absorption and thickness swelling was calculated using equation 4 and 5 respectively.

Determination of mechanical properties

Modulus of Rupture (MOR)

The test samples were subjected to flexural tests (Modulus of Rupture) in accordance with American Society for Testing and Materials (ASTM D570-98 2005). The bending strength test was assessed using test specimen of 194 × 50 × 13mm subjected to 3-point loading on Hunsfield Tensiometer machine. Each of the test specimens was supported by two rollers and loaded at the center. The forward movement of the machine leads to gradual increase of load at the middle span until failure of the test specimen occurs. At the point of failure, the force exerted on the specimen was recorded.

The MOR was calculated using the mathematical formula below:

$$\text{MOR}\ (\text{N/mm}^2) = \frac{3\rho L}{2bd^2} \qquad (5)$$

where:

MOR = Modulus of Rupture
p = Failing Load
L = Span between center of support
b = Width of test specimen (mm)
d = Thickness of test specimen (mm)

Modulus of Elasticity (MOE)

The modulus of elasticity was calculated from the data obtained from bending test performed on each specimen using the formula:

$$MOE\ (\text{N/mm}^2) = \frac{\rho L^2}{bd^3 H} \qquad (6)$$

where:

MOE = Modulus of Elasticity
p = Failing Load (N)
L= the span of board sample between the machine supports (mm)
b = width of the board sample (mm)
d = thickness of the board sample (mm)
H = Increase in deflection

Statistical analysis

The data collected was subjected to descriptive and graphical data presentation, while statistical analysis was carried out using Analysis of Variance (ANOVA) to determine significant effect of board type, board densities and cement: wood ratio. Follow-up test was carried out using Duncan Multiple Range Test (DMRT) to determine magnitude of significant difference between each level as described by Akindele (2004).

RESULTS AND DISCUSSIONS

Physical properties of cement bonded board

The result for the physical properties of the experimental boards produced, which include mean value for WA and TS in 24h water soak test and, WA and TS following accelerated aging test are presented in Tables 2 and 5. The effect of cement: wood ratio and board density on WA and TS in 24h water soak test and after accelerated aging test on the experimental boards produced from the wood specie employed in the study are shown in Fig. 1 and 2.

Water absorption and thickness swelling in 24h water soak

The mean values for WA and TS in 24h water soak test for the experimental boards ranged from 3.06 to 6.99% and 1.40 to 7.51%, respectively (Table 2). Both WA and TS decreased with increase in board density and cement: wood ratio (Fig. 1)**.** Analysis of variance carried out at 5% probability level to test for significant differences among the production variables for WA and TS are presented in Table 3. The result showed that, there were significant differences in the main effect of board density and cement: wood ratio of WA and TS at 5% probability level. Also the interactions between density and cement: wood ratio were significant at 5% probability level. Duncan Multiple Range Test was used for the separation of means at 5% probability level. The result shows that the effect of board density and cement: wood ratio were significant on WA and TS (Table 4).

The decreased in WA with increase in board density and cement: wood ratio, implies that the experimental boards produced at the lower board density and cement: wood ratio was inferior compared with those produced at higher production parameters, therefore, the performance in service will be low and area with small loads bearing may be suitable for the boards with the lower production parameters. These observed differences in WA with increasing cement: wood ratio and board density may be due to changes brought about by increase in cement paste mixed with the wood sawdust with increase in production parameters, thereby leaving little pores for water to penetrate the experimental boards. These findings are in agreement with the earlier reports by Fabiyi (2004); Fuwape (1992) and Oyagade (1990). They reported that decrease in WA with increase in board density at a given level of layer can be explained by decrease in porosity of the board as density increased. At a given density, when cement wood ratio increase, the degree of compaction was reduced leading to increased in void volume. Based on this study, the CBB with the lowest board density (800kg/m^3) would be preferred for applications that require boards of light weight such as ceiling for easy installation. The CBB with low cement:wood ratio (1:1) would be more economical because a small quantity of cement is required with a large quantity of wood particles used in this study (sawdust) during CBB production. The procurement of cement is more expensive than that of sawdust. The observation made in this study with respect to TS agrees with the one made by Geimer *et al*. (1993).

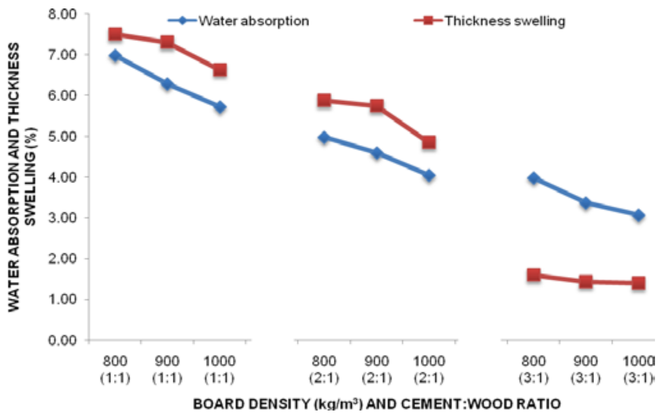

Fig. 1.
Effect of board density and cement: wood ratio on WA and TS for cement bonded board in 24-hour water soak test.

Table 2
Mean values for water absorption and thickness swelling as influenced by board density and cement: wood ratio

Density (kg/m^3)	Cement: wood ratio	WA±SD (%)	TS±SD (%)
800	1:1	6.99±0.06	7.51±0.19
	2:1	4.97±0.05	5.88±0.11
	3:1	3.98±0.05	1.60±0.19
900	1:1	6.28±0.03	7.31±0.15
	2:1	4.58±0.08	5.75±0.16
	3:1	3.36±0.17	1.43±0.02
1000	1:1	5.72±0.02	6.63±0.19
	2:1	4.03±0.09	4.85±1.08
	3:1	3.06±0.05	1.40±0.02

Table 3
Result of analysis of variance for water absorption and thickness swelling in 24-hour water soak test

Source of variation	df	Sum of square	Mean square	F-cal
Density	2	11.18	5.59	230.26*
Cement:wood ratio	2	131.73	65.87	2714.00*
Density * Cement:wood ratio	4	0.62	0.16	6.41*
Error	24	1.31	0.02	
Total	48	697.37		

*Significant ($p<0.05$) probability level

Table 4
Result of Duncan Multiple Range test (DMRT) for water Absorption and thickness swelling in 24-hour water soak test

Board density		**Cement: wood ratio**	
800	4.82^a	1:1	6.03^a
900	4.32^b	2:1	4.07^b
1000	3.91^c	3:1	2.94^c
SE±	**0.03**		**0.03**

Alphabets with different letters are significantly different ($p< 0.05$)

Water Absorption and Thickness Swelling following Accelerated Aging

Following accelerated aging test, WA for the experimental boards ranged from 3.41 to 8.12% while TS ranged from 3.46 to 15.58% as shown in Table 5. WA and TS decreased with increase in board density and cement: wood ratio (Fig. 2). Analysis of variance carried out at 5% probability level to test for significant differences among the production variables for WA and TS following accelerated aging are presented in Table 6. The results showed that, there were significant differences in the main effect of board density and cement: wood ratio of accelerated WA and TS at 5% probability level. Also the interaction between cement: wood ratio and density were significant at 5% probability level. Duncan Multiple Range Test was used for the separation of means at 5% probability level. The result shows that the effect of board density and cement: wood ratio were significant on accelerated WA and TS following accelerated aging (Table 7).

Following accelerated aging test, the boards absorbed water but the water absorption and thickness swelling varies with the increased in the production parameters. The board with cement: wood ratio 1:1 and density of 800kg/m^3 is found to be more porous and absorb more water faster because of the presence of more sawdust in it. The void was filled with water thereby increasing the quantity of water constantly stocked in the voids and eventually increasing the weight of the boards. Experimental boards produced at higher cement: wood ratio and board density of 1000kg/m^3 were more stable following accelerated aging test. The decreased in WA and TS with increase in production variables observed for the experimental boards following accelerated aging test is in agreement with the previous report by Ajayi (2005).

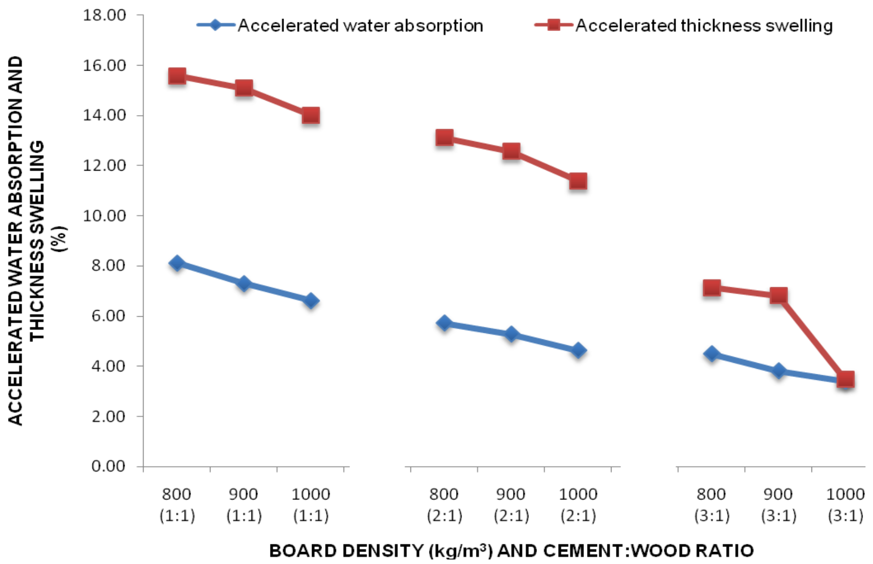

Fig. 2.
Effect of board density, cement: wood ratio and wood species on WA and TS for cement bonded board following accelerated aging.

Table 5
Mean values for water absorption (WA) and thickness swelling (TS) following accelerated aging as influenced by board density and cement: wood ratio

Density (kg/m^3)	Cement: wood ratio	WA±SD (%)	TS±SD (%)
800	1:1	8.12±0.08	15.58±0.66
	2:1	5.72±0.06	13.11±0.21
	3:1	4.50±0.62	7.12±0.22
900	1:1	7.31±0.03	15.08±0.18
	2:1	5.27±0.05	12.56±0.08
	3:1	3.80±0.17	6.81±0.17
1000	1:1	6.63±0.07	14.01±0.39
	2:1	4.63±0.06	11.38±1.24
	3:1	3.41±0.06	3.46±1.00

Table 6

Result of the analysis of variance test for water absorption and thickness swelling following accelerated aging

Source of variation	Df	Sum of square	Mean square	F-cal
Density	2	15.11	7.555	295.68*
Cement:wood ratio	2	173.929	86.965	3404.00*
Density * Cement:wood ratio	4	0.882	0.22	8.63*
Error	24	1.38	0.026	
Total	48	510.875		

*Significant (p<0.05) probability level

Table 7

Result of the Duncan Multiple Range Test (DMRT) for Water Absorption and thickness Swelling following Accelerated Aging

Board density		**Cement:wood ratio**	
800	5.36^{a}	1:1	6.76^{a}
900	4.80^{b}	2:1	4.50^{b}
1000	4.30^{c}	3:1	3.21^{c}
SE±	**0.03**		**0.03**

Alphabets with different letters are significantly different (p< 0.05)

Mechanical properties

The mean values for the mechanical properties of experimental CBB which include MOR and MOE were presented in Table 8 and 11. The effect of cement: wood ratio and board density on MOR and MOE on the experimental boards produced are illustrated in Figs. 3 and 4.

Modulus of rupture

The mean values for MOR of the experimental boards produced from the wood species at different levels of cement: wood ratio and board density ranged from 0.76 to 10.22N/mm^2 (Table 8). MOR increased with increase in cement: wood ratio and board density (Fig. 3). Analysis of variance carried out at 5% probability level to test for significant differences among the production variables for Modulus of Rupture are presented in Table 9. The result shows that, the main effects of all the study variables (board density and cement: wood ratio) on MOR were significantly different at 5% probability level. Also the effect of the interaction between density and cement: wood ratio was significant at 5% probability level. Duncan Multiple Range Test was used for the separation of means at 5% probability level. The result shows that the effect of board density and cement: wood ratio was significant on Modulus of Rupture (Table 10).

As evident from Table 4, boards produced at 3:1 and 1000kg/m^3 gave the highest mean values of Modulus of Rupture while boards produced at cement: wood ratio 1:1 and density of 800kg/m^3 gave lowest mean values of Modulus of Rupture. This pattern of variations in Modulus of Rupture for experimental boards produced from *Gliricidia sepium* shows that an increased in the quantity of cement in the boards caused increase in the Modulus of Rupture for the experimental boards. This observation agrees with previous report by Badejo *et al.* (2011) and Eshmaiel *et al.* (2008). The MOR obtained in this study compared favorably with values reported in literature by Dinwoodie (1978); Bison (1978); Badejo (1988) and Fuwape (1995). The board produced at higher board density and cement: wood particles ratio may be of better load bearing and better shelf life. The board density and cement: wood ratio highly influenced the properties of the board. The boards meet requirement for building board type HZ of 9.0N/mm^2 (Bison 1978).

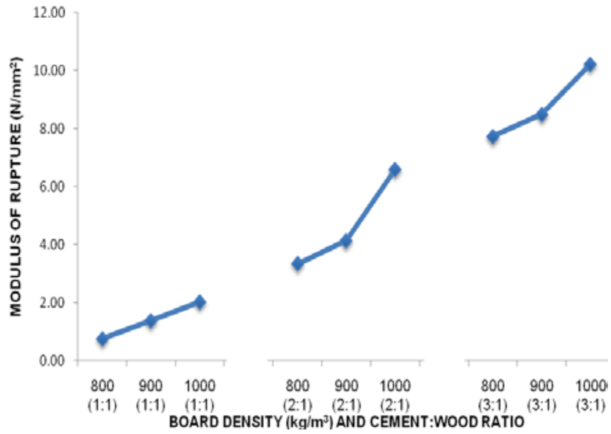

Fig. 3.
Effect of board density and cement: wood ratio on modulus of rupture for cement bonded board.

Table 8

Mean values for Modulus of Rupture (MOR) and Modulus of Elasticity (MOE) as influenced density and cement: wood ratio

Density (kg/m^3)	Cement: wood ratio	MOR±SD (N/mm^2)	MOE±SD (N/mm^2)
800	1:1	0.76±0.06	1800.77±11.10
	2:1	3.34±0.14	2880.17±87.28
	3:1	7.73±0.31	4140.72±9.44
900	1:1	1.37±0.01	2530.25±20.88
	2:1	4.13±0.57	3330.01±21.58
	3:1	8.48±0.24	4430.20±7.35
1000	1:1	2.03±0.33	4020.83±37.83
	2:1	6.59±0.52	4050.83±52.00
	3:1	10.22±0.97	5220.60±47.44

Table 9

Result of Analysis of Variance for Modulus of Rupture

Source of variation	df	Sum of square	Mean square	F-cal
Density	2	139.02	69.51	128.07*
Cement:wood ratio	2	1272.31	636.15	1172.00*
Densities * Cement:wood ratio	4	11.37	2.84	5.24*
Error	24	29.31	0.54	
Total	48	404.60		

*Significant (p<0.05) probability level

Table 10

Result of Duncan Multiple Range test for Modulus of Rupture and Modulus of Elasticity

Board density	MOR	MOE	Cement:wood ratio	MOR	MOE
800	4.99^{c}	457.28^{c}	1:1	1.91^{c}	471.57^{c}
900	6.49^{b}	429.24^{b}	2:1	6.17^{b}	428.19^{b}
1000	8.20^{a}	478.54^{a}	3:1	11.60^{a}	465.30^{a}
SE±	**0.14**	**9.58**		**0.14**	**9.58**

Alphabets with different letters are significantly different (p< 0.05)

Modulus of Elasticity

The mean value of MOE for the experimental boards produced from the wood species at different cement: wood ratio and board density levels employed ranged from 1800.77 to 5220.60N/mm^2 (Table 8). The MOE increased with increase in cement: wood ratio and board density (Fig. 4). Analysis of variance carried out at 5% probability level to test for significant differences among the production variables for MOE are presented in Table 11. The result showed that, there were significant differences in the main effect of board density and cement: wood ratio. Also, interactions between density and cement: wood were significant at 5% probability level. Duncan Multiple Range Test was used for the separation of means at 5% probability level. The result shows that the effect of board density and cement: wood ratio were significant on Modulus of Elasticity (Table 10).

The result indicates that the boards with the highest MOE were produced at cement: wood ratio 3:1 and board density of 1000kg/m^3 while the boards with the lowest MOE were produced at cement: wood ratio 1:1 and density of 800kg/m^3. Increase in MOE with increase in cement: wood ratio and board density implies that the elastic property of the boards produced is greatly influenced by the production variables. It may also be that the more the wood particles were closely compacted together, the higher the ability to prevent failure of the experimental boards, resulting in higher stiffness of the boards produced. The influence of cement: wood ratio on the MOE reported in this study is similar to other reports on CBB by Oyagade (1990) and Fabiyi (2004).

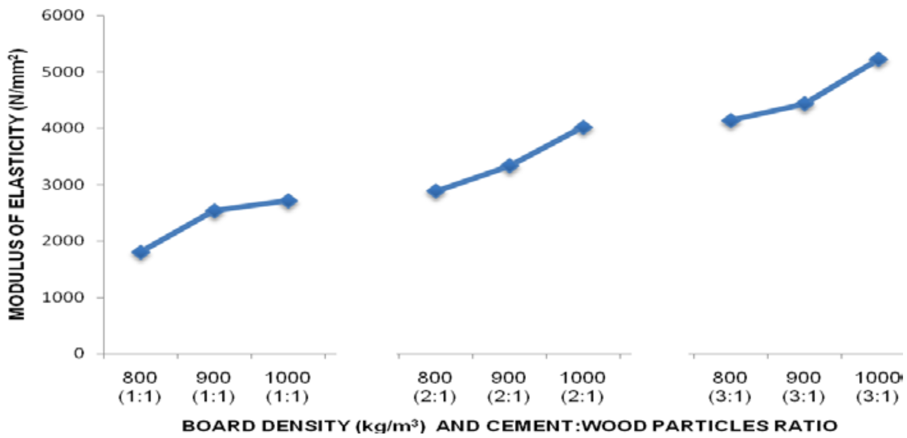

Fig. 4.
Effect of board density and cement: wood ratio on modulus of elasticity for cement bonded board.

Table 11

Result of Analysis of Variance for modulus of elasticity

Source of variation	df	Sum of square	Mean square	F-cal
Density	2	200797.95	100398.98	40.51*
Cement:wood ratio	2	1166417.45	583208.72	235.42*
Density * Cement:wood ratio	4	69204.74	17301.19	6.98*
Error	24	133774.34	2477.30	
Total	48	16360000.00		

*Significant ($p<0.05$) probability level

CONCLUSIONS

Basic information regarding production of CBB from *Gliricidia sepium* has been provided in this research. The production variables greatly help in determining physical and mechanical properties of the CBB produced. Water absorption, Thickness swelling, Accelerated aging test, Modulus of rupture and Modulus of elasticity of experimental boards produced were significantly influenced by cement: wood ratio and board density. CBB produced at cement: wood ratio 3:1 and 1000kg/m^3 will be more suitable for use in constructional work due to the better performance displayed. Since the properties obtained conformed favorably to values reported in literature, therefore, the suitability of *Gliricidia sepium* for the production of CBB product can be established.

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