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RESEARCH ARTICLE

PROFESSIONALS' PERCEPTION OF MAIN CAUSES ON MATERIALS WASTES IN NIGERIA BUILDING CONSTRUCTION INDUSTRY

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Abstract

Construction materials generally create a major portion of the total cost in building construction project. This paper examined the Professional's Perception of Materials Management Practices on Construction Sites in selected states in Nigeria through the use of structured questionnaires, administered to senior construction professional personnel of construction firms. The data generated were analyzed using descriptive statistics. The study found that delay in the completion time of project such as storage of materials on-site with mean value (4.9), incompetence of estimators (4.8), issuing of materials for use (4.7) and procurement for materials (4.6). The paper concludes that materials management practices necessitate a revolution to advance the overall in the handling of materials for more efficiency and effectiveness on the construction site.

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Introduction:-

Material management had been seen as coordinates planning, assessing the requirement, sourcing, purchasing, transporting, storing and controlling of materials, minimizing the wastage and optimizing the profitability by reducing the cost of material (Albert, 2014). While Eduardo (2002) viewed Materials management as the system for planning and controlling all of the efforts necessary to ensure that the correct quality and quantity of materials are properly specified in a timely manner, are obtained at a reasonable cost and most importantly are available at the point of use when required.

According to Khyomesh and Chetna, (2011) Building materials account for 60 to 70 per cent of the direct cost of a project or a facility, the remaining 30 to 40 per cent being the labour cost. It is important for the project manager to consider that there may be a significant difference in the date that the material was requested or the date when the purchase order was made, and the time at which the material will be delivered.

The goal of materials management is to ensure that construction materials are available at their point of use when needed. The materials management system attempts to ensure that the right quality and quantity of materials are appropriately selected, purchased, delivered and handled on-site in a timely manner and at a reasonable cost,

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(khyomesh and chetna 2011). The scope of materials waste is vast, and this waste occurs in the industry irrespective of the size of the building firm, instructions about handling, storage and stacking are not provided with the goods or sent in advance to the site (Abdulazeez, 2000).

Ensuring the timely flow of materials is an important concern of material management (Shah, 1993). Thus, Materials management is an important element in project management. If materials are purchased too early, capital may be held up and interest charges incurred on the excess inventory of materials (Wendy, 2006). Due to the high cost of materials, if not properly managed during the period of execution of the contract can lead to the abandonment of the project. Therefore, attention must be paid to how materials are been procured, stored and managed in order to achieve perfect work, effective handling of materials, right usage of materials and control of construction resources.

This, explain the reason why Johnston (2001), noted that Materials management begins with planning and estimation, these can be achieved through proper site co-ordination measure of reducing wastes, the location and security of materials on sites, procurement of quality materials as being specified and effective administration of site together with quality control. Lee and Donald (2001), observed that the problem associated with the absence of proper materials management on construction site could be wastage of resources making contract cost more than the budget sum, reduction of the profit margin of the contractor ineffectiveness of project handlings reduction of output etc.

According to Ademeso and Windapo (2008), poor planning and control of materials, lack of materials when needed, poor identification of materials, re-handling and inadequate storage cause losses in labour productivity and overall delays that can indirectly increase total project costs. Materials management functions include planning and taking off materials, vendor evaluation and selection, purchasing, expenditure, shipping, material receiving, warehousing and inventory, and material distribution. Materials management can only produce what it should with the right quantities of the right material at the right time (Arnold and Chapman 2004).

The present state of the building construction industry in Nigeria reflects various problems ranging from delays in project execution/delivery, substandard work, disputes, to cost and time overrun as a result of material shortage and wastages on sites, theft and displacement of materials on sites, as well as poor accounting and security system of the concerned sites/firms (Adafin, 2011). Non-compliance strictly with project bill of quantities, schedule of materials, specifications and construction programme in material stock control practice is another contributing factor which tends gradually to decrease the profitability of a project also often leads to the extension of time respectively, and hence no proper material stock control practice (Inyang Udoh, 2002).

Research Method:-

The primary data was attained through field survey. In order to collect data and to meet the set objectives of the research, a structured questionnaire based on the aim of this study was designed. 261 questionnaires were randomly administered among the built environment professionals (Architects, Builders, Engineers, Quantity Surveyor, Town Planners, and Project Manager etc.) across the six (6) states in south-west Nigeria at a senior cadre level in all categories of construction firms duly registered with the corporate affairs commission in Nigeria, descriptive statistics were adopted for the analysis of the data.

Discussion of Findings:-

The data collected for the purpose of this study were evenly supplied by professional in all various types of construction firms where materials managements are being administered. Demographics show that shows that 14.2% of the respondents are (National Diploma Certificate) ND holders, 24.5% are (higher national diploma) HND holders (3.1). In summary, about 75.3% of the respondents have first, second degree and above. The distribution of respondent's profession is shown in table 3.1, show that the highest concentration of the respondents was the project manager (27.6%), next are builders (33.9%), then Engineers (16.9%), Architect (22.6%) Quantity Surveyor (7.3%), while 2.3% are for remaining professions. The study confirmed that 46% of the respondents have been working with construction firms for more than sixteen years while about 19.5% have experienced between 11-15, and 34% had working experience ranges from ten (10) years and below.

The result of analysis of professional perception on material management practices revealed that the person in-charge-of managing construction material is the store manager (53.3%), followed by the project manager (10%), then General Manager (10.3%) while site engineer (16.9%) and others (9.6%).

Table 4.1:- Profile of Respondents' Professional.

Education	Frequency	Percent
ND	37	14.2
HND	64	24.5
BSC/B.TEC	80	30.7
MSC/M.TEC	70	26.8
PhD/M/PHI	10	3.8
Profession	Frequency	Percent
Architect	59	22.6
Builder	61	23.4
Engineer	44	16.9
Quantity Surveyor	19	7.3
Project Manager	72	27.6
Town Planner	6	2.3
Year of Experience	Frequency	Percent
Less than 5	33	12.6
btw 6-10	57	21.8
btw 11-15	51	19.5
btw 16-20	82	31.4
above 21	38	14.6
Responses	Frequency	Percent
General Manager	27	10.3
Project Manager	26	10
Site Manager	44	16.9
Store Manager	139	53.3
Other	25	9.6
Responses	Frequency	Percent
General Manager	12	4.6
Site engineer	28	10.7
Procurement manager	190	72.8
project manager	21	8
others	10	3.8
Total	261	100

Source: Field Survey, 2020

However, the result of the finding of professional responsibility for the ordering of materials confirmed that (72.8%) of the respondents for procurement department responsible for ordering materials, (8%) of the project manager responsible for this duty, (10.7%) for site engineer while (4.6%) of the General Manager for the ordering of materials and (3.8%) for others.

Table 3.2:- Professional Perception of Component of Materials Management

S/N	Components of Material Management	N	Min.	Max.	Mean	Std. Dev.
1	material estimation, budgeting, planning & programming	261	4	5	4.91	0.287
2	scheduling, purchasing & procurement	261	3	5	4.696	0.569
3	receiving & inspection	261	3	5	4.214	0.755
4	inventory control, storage & warehousing	261	4	5	4.678	0.471
5	material handling & transport	261	3	5	4.482	0.66
6	waste management	261	4	5	4.875	0.333

Source: Field Survey, 2020

The result of analysis on the component of materials management in table 3.2 shows that material estimation, budgeting, planning & Programming has mean value (4.9) follow by Waste management (4.8), followed by scheduling, purchasing and procurement and Inventory control, storage and warehousing (4.6), material handling and transport (4.4) while Receiving and inspection (4.2). the result of causes of materials waste on sits in table 3.3 established that, (4.8) respondents strongly agree that handling of materials is the major cause of materials wastage, follow by lack of site materials control, workers mistakes, and design changes and revisions causes a waste increase (4.7) while (4.6) of the means value believes that Lack of waste management plan, Over- ordering or under-ordering due to mistakes in quantity surveys and Ordering of materials that do not fulfil project requirements defined on design document causes a waste increase on construction site.

Table 3.3:- Professional Perception of Causes of Materials Waste on Sites.

S. N	Causes of materials wastage on sites	N	Mi n.	M a.	Mea n	Std. Dev
1	weather condition	261	3	5	4.642	0.644
2	batching of materials	261	3	5	4.107	0.755
3	placing of materials	261	3	5	4.464	0.761
4	stocking and pilfering	261	3	5	4.375	0.675
5	distance	261	3	5	4.196	0.672
6	handling of materials	261	3	5	4.803	0.443
7	labour force	261	2	5	4.464	0.873
8	inexperience personnel	261	3	5	4.285	0.731
9	equipment malfunctioning	261	2	5	4.035	0.852
10	lack of information about the type and size of materials on the design document	261	3	5	4.339	0.815
11	error in information about type and size of materials on design document	261	2	5	4.196	0.882
12	design changes and revisions	261	3	5	4.714	0.562
13	ordering of materials that do not fulfil project requirements defined on design document	261	3	5	4.678	0.542
14	over-ordering or under-ordering due to mistakes in quantity surveys	261	3	5	4.607	0.651
15	damage of materials due to deficient stockpiling and handling of materials	261	3	5	4.553	0.63
16	imperfect planning of construction	261	3	5	4.392	0.73
17	workers mistakes	261	3	5	4.732	0.485
18	conversion waste from cutting uneconomical shape	261	2	5	4.16	0.757
19	lack of site materials control	261	3	5	4.75	0.513
20	lack of waste management plan	261	3	5	4.678	0.575
21	lack of adequate storage space	261	3	5	4.589	0.626

22	lack of adequate room for account for materials & materials becoming buried on site	26 1	2	5	4.23 2	0.808
23	difficult to transport materials around site	26 1	2	5	3.96 4	0.952
24	workplace becoming overcrowded	26 1	3	5	4.21 4	0.779
25	increase security risks due to lack of adequate space to safely facilitate the storage of materials	26 1	3	5	4.35 7	0.672

Source: Field Survey, 2020

Conclusion:-

Based on the result of the findings, the following conclusion was necessary:

1. the needs to transforms, to improve the overall handling of materials for more efficiency and effectiveness on the construction site. This is because poor handling of construction materials adversely affects the overall performance of construction projects in terms of cost, time, quality and productivity.
2. proper management of materials in construction sites, this will help materials management in Nigeria construction sites, as it supports the speedy completion period, and saves time of execution,
3. it gives high quality works and reduces the materials wastage.
4. improper material management on-site needs are checked and prevented in order to achieve the desired output.
5. The need for minimized materials wastage during the construction phases is important in order to avoid loss of profits.

All these should be put into consideration before the commence of a construction project and other essential and acceptable provisions are to be provided. Because proper materials management will be of advantage to both the professionals and the firm in all ways.

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