



## Construction Materials Management Practices and Sustainable Property Development Projects in Akure Metropolis, Ondo State, Nigeria

Abioye, L. A<sup>1</sup> and Ojo, O. J<sup>2</sup>

<sup>1</sup>Department of Project Management Technology, Federal University of Technology, Akure, Nigeria

<sup>2</sup>Department of Project Management Technology, Federal University of Technology, Akure, Nigeria  
[abioyeadekunle372@gmail.com](mailto:abioyeadekunle372@gmail.com)

### ABSTRACT

Construction materials management practices and property development projects delivery was studied in Akure metropolis in Ondo State, Nigeria. This was with a view to finding solutions to lack of proper delivery and inadequate procurement processes of construction materials. The study covered six properties development organizations in the city. The research instrument used was questionnaire. It elicited information on the issues such as years of work experience, academic qualification, and standard construction materials management practices. The data collected were analyzed using descriptive statistical tools. The result among others showed that lack of proper delivery of material (3.86), inadequate procurement processes (3.76), and inadequate storage facilities (3.71) affected construction materials management practices in the study area. The study recommended among others that there should be adequate logistics and transportation planning that will aid delivery of construction material to the site.

**Key words:** Construction materials, Management practices, Property development, Development projects, Akure metropolis

### INTRODUCTION

Construction material denotes all types of materials used in the construction of building projects. These materials include electrical and mechanical fittings and fixture that are incorporated during the execution of the projects. The materials may be permanent or temporary for supporting works at construction site.

Materials management can be described as a tool to optimize performance in meeting customer service requirements at the same time adding to profitability by minimizing cost and making the best use of available resources [1]. Also, construction materials management is a key to success of a construction project [2]. In property development, efficient materials management is vital. Therefore, construction materials management practices in building construction includes adequate materials planning, procurement, job site inventory control, handling and transportation both off-site and on-site and waste reduction. The goal of materials management is to ensure that the materials are available at their point of use when needed. Hence, efficient procurement of materials represent a key role in the successful completion of the work [3]. Construction activities in Nigeria play an important role in development of the nation's economy [4]. [5] stated that construction plays an important role in the meeting the needs of the society and enhancing quality of life. Construction is becoming increasingly competitive and materials management is considered to be one of the methods for cost reduction to improve profitability and productivity. Construction materials constitute a major cost component in any construction project [3, 5, 6]. When construction of a project is ongoing, the scope, time, cost and quality need to be monitored and controlled. Construction materials consume about sixty percent (60%) of the project cost, therefore, materials should be effectively managed.

Materials management is considered as a means to achieve better productivity, which should be an aspect of cost reduction. Materials represent a major expense in construction, so minimizing procurement or purchase cost presents important opportunities for reducing cost [7]. Project and construction management have to ensure procurement of right items at the right time in accordance to the standards, specifications and requirements of scheduled activities.

In the study area, most of the Property Development Organizations faced challenges such as time overrun, cost overrun and project abandonment, due to ineffective materials management practices. Also, failure to track delivery and receipt of materials ordered for to a construction site somehow affect few organizations. Due to the challenges stated, therefore, the study assessed the construction materials management practices and examined the factors influencing construction materials management practices and property development projects delivery in the study area.

## MATERIALS AND METHOD

### Research Design

The study adopted a survey design technique through the administration of a structured questionnaire on employee of Property Development Organisation (PDOs).

### Study Area

The study was carried out in Akure metropolis, the state capital of Ondo State, Nigeria. Ondo State is generally referred to as the “Sunshine State” was created out of the defunct Western Region on the 3<sup>rd</sup> of February, 1976. The State is located on latitude 7 10N and covers a land scale area of 14,793 square kilometers and consist of 18 Local Government Areas with its administrative capital located in Akure City. Ondo State is located within south-west geographical zone of Nigeria and bounded in the North by Ekiti and Kogi States, in the East Edo State, in the West by Osun and Ogun States and in the South by Atlantic Oceans. The State is located entirely in the tropics with an estimated population of 3,441,024 [8]. The ethnic composition of Ondo State is largely from the Yoruba sub-groups of the Akoko, Akure, Ikale, Ilaje and Ondo. The city involves in construction projects such as residential, commercial and heavy engineering construction, industrial and development of new facilities.

### Population of the Study

The population of the study includes the employees of the Property Development Organisations, These include J. Ajayi Patumola Development Company, Aso savings and Loans Plc, House of Henry Properties, Sunny B Properties, Ondo State Housing Development Corporation and Sunshine Estate Developers. Table 1 shows the distribution of the population of the study.

**Table 1- Population and sample size of the study**

Organisations	Standard deviation	Sample size
J. Ajayi Patunola development company	52	46
Aso savings limited	35	32
House of Henry Properties	38	35
Sunny B properties	28	26
Ondo State housing development corporation	80	67
Sunshine estate developers	30	28
<b>Total</b>	<b>263</b>	<b>234</b>

Source: Field Survey, 2021

### Sample Size

The sample size was derived from Taro Yamane formula

### Sampling Technique

Random sampling technique in each of the organizations

### Data Collection

Data for the study were derived from primary source. The primary data were obtained from structured questionnaire designed in rating scale of 1 to 5. The questionnaire was designed to elicit information on the construction material management practices used and factors affecting construction materials management practices in sustainable property development projects delivery in the study area.

### Data Analysis

The data collected were analyzed using descriptive statistical tools. These include frequency, tables, percentage and standard deviation. The descriptive analysis was conducted to describe the phenomenon under consideration [9]. The study applied descriptive analysis to avail the characteristics peculiar to the constructs of the research.

## RESULTS AND DISCUSSION

### Response Rate

A total number of two hundred and thirty four (234) copies of questionnaires were distributed among the professionals in the organization out of which one hundred and ninety six (196) copies were retrieved representing 83.7% of the total respondents. Therefore, one hundred and ninety six copies (196) were used for the analysis as shown in Table 2.

**Table 2- Response Rate of Questionnaire**

Copies of Questionnaire	Respondents	
	Frequency	Percent
Quantity Distributed	220	100.0
Quantity Valid and Useable	196	83.7

Source: Field Survey, 2021

### Socio-economic Characteristics of the Respondents

Table 3 shows the socio-economic characteristics of the respondents. The male respondents out-numbered their female counterparts (82.1% versus 17.9%). This finding shows that male respondents dominate the industry under study. The age distribution of the respondents indicates that 56.3% of the respondents were forty years and above. The finding on age shows that averagely, the respondents are mature in handling the organization issues. Concerning the profession of the respondents, the Table indicates that 34.7% were builders, 30.6% civil engineers, 19.9% were procurement officers while 14.8% did not belong to the profession listed. It can be inferred that 65.3% of the respondents were builders and civil engineers which indicate that construction materials management practices is not new to them.

For the highest qualification of the respondents, the Table shows that 44.9% of the respondents had B.Sc/B.Eng/B.Tech, 28.1% had Higher National Diploma (HND), 14.8% did not belong to the qualifications highlighted, while 12.2% had M.Sc/M.Tech. The findings indicate that majority of the respondents are relevant to the industry. Years of work experience of the respondents indicates that 65.1% of the respondents have above 16 years of work experience. It means that majority had recorded a considerable length of work experience in the industry.

**Table 3- Socio-economic Characteristics of Respondents**

Characteristics	Residents	
	Frequency	Percentage
<b>Gender</b>		
Male	161	82.1
Female	35	17.9
<b>Total</b>	<b>196</b>	<b>100.0</b>
<b>Age Group</b>		
30-39years	69	35.2
40-49years	87	44.4
50years & above	40	20.4
<b>Total</b>	<b>196</b>	<b>100.0</b>
<b>Profession</b>		
Builders	68	34.7
Engineers	60	30.6
Procurement Officers	39	19.9
Others	29	14.8
<b>Total</b>	<b>196</b>	<b>100.0</b>
<b>Academic Qualification</b>		
HND	55	28.1
B.Sc/B.Tech/B.Eng	88	44.9
M.Sc/M.Tech	24	12.2
Others	29	14.8
<b>Total</b>	<b>196</b>	<b>100.0</b>
<b>Work Experience</b>		
6-10years	<b>37</b>	<b>18.9</b>
11-15years	<b>51</b>	<b>26.0</b>
16-20years	<b>91</b>	<b>46.4</b>
Above 20years	<b>17</b>	<b>8.7</b>
<b>Total</b>	<b>196</b>	<b>100.0</b>

Source: Field Survey, 2021

### Construction Materials Management Practices

Table 4 shows among others the perceived standard construction materials management practices in the industry. These perceived management practices were rated on a rating scale of 1 strongly disagree to 5 strongly agree, none of the practices was rated very high. However, all the practices were rated above average (3.1). This means that all the practices were those required in the industry, though the respondents in the study area failed to implement some of the practices. Storage facilities are kept locked after issuing materials for a particular job (4.01), when materials are stored they do not deteriorate before use (3.78) and accurate stock control maintained with regular checks (3.77). Provision and adequate use of storage facilities, proper materials planning method and use are the common practices of materials management [10]. Materials management, if used effectively, can promote profit maximization of an organization.

**Table 4- Construction Materials Management Practices**

Statements	Standard deviation	Mean	Rank
The materials delivered as required so that site storage time is cut to a minimum storage time	0.94	3.16	10
Issuing of just the right amount of materials with only a reasonable allowance for wastage to workmen	0.88	3.24	9
Allocate and prepare storage area	0.76	3.53	8
Regular checking of availability of materials in the store	0.83	3.63	6
The control of materials on site exercised in respect of waste	0.82	3.55	7
Excessive amount of offcuts on site	0.83	3.69	5
Materials delivered are those specified for the particular job	0.95	3.71	4
Accurate stock control maintained with regular checks	0.95	3.77	3
Storage facilities are kept locked after issuing materials for a particular job	2.32	4.01	1
When materials are stored they do not deteriorate before use	0.96	3.78	2

Source: Field Survey, 2021

Mean Rank: Strongly Disagree = 0.00-1.0; Disagree = 1.1-2.0; Somehow Agree = 2.1 – 3.0; Agree = 3.1 – 4.0; Strongly Agree = 4.1- 5.0

### Factors Affecting Construction Materials Management Practices

Table 5 shows the perceived factors affecting construction materials management practices. When rated on a rating scale of 1 very low to 5 being very high none of these factors was rated very high. However, all the factors were rated moderately. This means that all factors affected construction materials management practices in the study area.

Lack of proper delivery of materials (3.86), inadequate procurement processes (3.76), inadequate storage facilities (3.71), waste on construction site (3.68), off-site challenges in controlling the materials (3.67), changes to construction design (3.62), lack of security personnel (3.59), fraudulent practices (3.52), and lack of proper work plan and schedule (3.51). These factors may lead to project time and cost overrun. Factors affecting construction materials management practices include; site conditions, planning and handling of materials on site, suppliers and manufacturers default and governmental interferences [11].

**Table 5- Factors Affecting Construction Materials Management Practices**

Statements	Standard deviation	Mean	Rank
Lack of proper work plan and schedule	0.96	3.51	9
Fraudulent Practices	0.81	3.52	8
Lack of security personnel	0.77	3.59	7
Off-site challenges in controlling the materials	0.83	3.67	5
Changes to construction design	0.92	3.62	6
Waste on construction site	0.92	3.68	4
Inadequate storage facilities	0.95	3.71	3
Inadequate procurement process	0.98	3.76	2
Lack of proper delivery of materials	0.95	3.86	1

Source: Field Survey, 2021

Mean Rank: Very Low = 0.00- 1.0; Low = 1.1- 2.0; Moderately low = 2.1-3.0; High = 3.1 – 4.0; Very High = 4.1- 5.0

### CONCLUSION AND RECOMMENDATIONS

The study has been able to empirically assess the construction materials management practices and property development projects delivery in Akure, Ondo State, Nigeria. This was with a view to finding solutions to lack of proper delivery of materials, inadequate storage facilities and waste on construction sites among others. From the conclusion, the following recommendations were made;

- I. There should be adequate logistics and transportation planning that will aid delivery of construction materials to the site.
- II. There should be adequate procurement plan before the acquisition of materials. The plan should be followed both by the buyer and the seller. Procurement plan includes provision of site storage facilities.

#### REFERENCES

- [1]. Albegbulem and Okoriec, Assessment of Materials Management and Profitability of an Organization (2015) Vol 9 No 3.
- [2]. A Idowu, Winston and S Winston, An Investigation of Materials (2017) Vol. 4 No 1.
- [3]. Management on Sustainable Construction in Nigeria.
- [4]. Study of Material Management on Construction Project.
- [5]. T Subramami, NV Bnas Kora, A David, GB Mohammed and NK Siva, A Study of Inventory Management in Construction Industry (2017).
- [6]. Harshal, M Patil, Study of Correlation Factors of Material Management in Building Construction Industry, *International Journal of Latest Engineering and Management Research* (2017)Vol 2, 2455-4847.
- [7]. PS Pratik, SS Komol, and KC Chetana, Importance of Material Management on Construction Sites (2018).
- [8]. HI Babalola, and OJ Ojo, An investigation into Factors Affecting The Performance of Public Construction Project in Ondo State, South-western, *Nigeria Journal on Civil and Environmental Research* (2016) 8 (1) 72-79.
- [9]. Mammon and Omozokpia, An Evaluation of Factors Affecting The Performance of Construction Projects in Niger State. *Journal of Environmental Sciences and Resources Management* (2014) Vol 6 (1) 34-43.
- [10]. TA Bamidele and OA Festus, Assessment of Material Management on Building Projects in Ondo State, Nigeria. *Journal of World Specific News* (2016) 55 (2016) 168-185.
- [11]. JM Zairra and Narimah, Influential Factors Affecting Materials Management in Construction Projects, *Management and Production Engineering Review* (2017), 8.