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An Assessment of Labour Productivity Influencing Factors in the Construction Industry: A Case study of Zaria, Nigeria

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Abstract

In this research, factors influencing construction labour productivity in Zaria, Nigeria was assessed. The aim of the research was to identify these factors and rank them according to their severity. This information will aid site managers and the construction professionals on decisions to take in-order to limit these controlling factors thereby leading to an improved level of efficiency in labour force, increase product labour productivity and reduce cost and time over runs on construction projects. The research adopted a quantitative research approach with the use of questionnaires as an instrument for data collection from site managers at construction sites in Zaria. The Questionnaire sought to assess the perception of site managers on factors affecting construction labour productivity. Thirty-Nine out of the Forty-One factors researched indicated high severity with the RII ranging between 0.60 ≤ RII < 0.80. The research revealed that external forces tend to affect construction labour productivity more than site factors and human labour factors. This can be attributed to the fact that the site engineers can control site factors and human labour factors while the external factors cannot be really controlled by the site engineers. The survey also revealed that rain, conflict with project stakeholders, skill of labour, and financial crisis had a very high severity in affecting construction labour productivity on the construction sites.

Keywords: *Construction Labour Productivity, Perception, Severity, Relative Importance Index (RII), Construction Industry, Nigeria.*

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I. INTRODUCTION

The Nigerian construction industry is be-devilled with issues ranging from corruption during the award of contracts, to the total neglect of projects due to cash flow problems. As a result, construction workers have been subjected to a work environment which does not encourage high levels of efficiency. The non-payment or delay of wages/salaries, the disruption of work due to lack of materials or tools, and the resulting loss of morale have led to an exodus of traditional craftsmen from the industry [1]. Attar, et al. [2] noted that construction is a key sector of the national economy for countries all around the world, as traditionally it takes up a big portion in the nation's total employment and its significant contribution to a nation's revenue as a whole. One of the main factors as noted by Khaled and Remon [3] influencing the construction industry growth is productivity and it is mainly associated with the labour performance. According to Bekr [4], Construction Labour productivity can be said to be the units of work produced or placed in an hour.

At low levels, CLP can be dangerous causing social conflicts to a Nation's economy[5, 6]. Identification of these factors affecting productivity levels is important, as it will aid site handlers in tackling such problems thereby reducing time and cost overruns [7, 8]. It will also help to improve labour productivity at the sites [9]. The construction industry's productivity is vital considering the enormous effect it has on a Nation's GDP [10]. An improved productivity means a rise in GDP.

This research identifies various labour productivity factors, analyse them statistically, assess the difference in perception between the various professionals in construction and finally looks at its findings in line with other previous studies.

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II. LITERATURE REVIEW

The construction industry in Nigeria is a very dynamic one. Over the last few years, impressive numbers have been recorded. The industry is heavily dependent on government expenditure, that's why the industry is growing at the same time with government revenue [11]. Jobs have been created with a great potential of expansion due to the labour intensiveness of construction industry and the ever increasing demand for services in the sector [12].

A. Concept and Characteristics of Labour

Abdullahi [13] defined labour as a term referring to all physical and mental work undertaken for monetary rewards. Amadeo [14] defined labour as the quantity of physical, mental and social effort used to produce goods and services. He classified labour into that based on skill level and that based on relationship with the employer. Based on skill level, labour is classified into Unskilled, semi-skilled and skilled labour. While classifying labour based on relationship is grouped into wage labour and contract labour.

According to Smriti [15] labour is perishable, it cannot be separated from the labourer, it is inelastic in supply, has differences in its efficiency and estimating it's production cost is difficult.

Kale and Doguwa [16] describe total labour force as comprising of the working age population that are either employed or unemployed. These are individuals within the ages 15 and older (64 years in the case of Nigeria).

B. Labour Productivity

Productivity refers to the output generated from a system and the input used to create output. It is expressed as:

$$Productivity = \frac{Output}{Input} \quad (2.1)$$

$$Labour\ Productivity = \frac{Output}{Labour\ cost} \quad (2.2)$$

or

$$Labour\ Productivity = \frac{Output}{Work\ hour} \quad (2.3)$$

1) Average Labour Productivity (ALP)

Average Labour Productivity ALP looks at the impact of one factor input (labour). Its main limitation is that as a single factor measure it cannot be used for analysis of total productivity performance [17]. According to Merrow, et al. [18], there are three approaches to measuring average labour productivity. The economist approach, the construction manager's approach and the project approach.

2) Total Factor Productivity (TFP)

According to [19], Total Factor Productivity (TFP) is the most widely used measure of productivity. Total factor productivity is the ratio of aggregated inputs to aggregated outputs Kendrick [20]. It's main disadvantage however, is that it allows little room for differentiating the influence of factors that can be controlled internally from those that are imposed externally.

C. Benefits of Productivity Management

According to Edosomwan [21] management of productivity enables the consumer to pay low prices for goods and services, ensure the effective utilisation of resources. Other benefits includes providing the basis for higher incomes for employees, providing an organisation with the strength to deal with internal operating weakness and external competition, enable an organisation to be more profitable and enable the public realise greater social benefits.

Other benefits as outlined by Eilon *et al* (1976) include:

- **For strategic purposes**: to compare the performance of the company with that of its competitors of related firms,
- **For tactical purposes**: to regulate the performance of the firm
- **For planning purposes**: as the basis for considering alternative adjustments over future periods.
- **For other management purposes**: such as collective bargaining with trade unions.

D. Factors affecting Construction Labour Productivity in Nigeria.

Odesola, et al. [22] in a research carried out in Bayelsa, Nigeria, assessed using questionnaire identified 18 factors that ranked according to their importance. These were, specification and standardisation as the most important while stoppage due to disputes was the least important. Edwin and Calistus [23] carried out a survey using questionnaires in carpentry and steel fixing in North-central Nigeria. A total of 21 factors were identified with design shape and size as the most important while labour personal problems was ranked as the least important. Odesola [24] carried out a research in Cross River, Nigeria. Thirty-one (31) factors were identified in the research. Material management was ranked the most important while lack of big picture view on behalf of the crafts was ranked the least. Olomolaiye, et al. [1] were among the first researchers on productivity in Nigeria. They carried out an assessment using activity sampling and questionnaire surveys. Eight (8) problems influencing craftsmen's productivity were identified in the research with lack of materials been ranked as the most important and changing of crew members was ranked the least important. Odesola and Idoro [25] carried out a study which covered the six geographical states in Nigeria's south-south geopolitical zone structured questionnaires. Fifteen (15) factors were identified in the research and ranked according to their level of importance. Craft workers' pride was ranked the most important and lack of competition was ranked the least.

F. Factors Influencing Construction Labour Productivity in other Countries

Khaled and Remon [3] in a research carried out in Egypt assessed thirty (30) factors which were ranked according to their level of importance. Enshassi, et al. [26] in a research carried in the Gaza strip assessed Forty-five (45) factors with the use of questionnaires. The factor ranked as the most

important was material shortages while the least important was noise. Thomas and Sudhakumar [27] carried out a survey with the use of questionnaires in India. Forty-three (43) factors were assessed. Unavailability of material on time at workplace was ranked the most important while excessive overtime was ranked the least. Jarkas and Bitar [28] assessed Forty-five (45) factors in a research in Kuwait. Clarity of technical specifications was the most important while rain was ranked the least important. Makulsawatudom and Emsley [29] in Thailand assessed Twenty-three (23) factors. The most important factor was lack of material while work shift was ranked the least. Hickson and Ellis [30] in a study in Trinidad and Tobago assessed forty-two (42) factors in their research. The most important factor was lack of labour supervision, unsuitability of storage location was ranked the least. Gundecha [31] used questionnaires sent by email to various professionals. Forty (40) factors were assessed in the study. The most important factor was lack of required construction material, while personal problems was ranked the least important.

III. Research Method

The quantitative approach was used. Method of data collection was literature review and structured questionnaire. The population frame of this research are site managers on Sixty-nine (69) active construction sites within Zaria.

1) Sampling method

A non-probability sampling method known as purposive sampling was used for the research. Kish's Formula was used for calculating sample size

$$n = \frac{n1}{1+\left(\frac{n1}{N}\right)} \quad (3.1)$$

Where n = Sample size

$$n1 = \frac{s^2}{v^2} \quad (3.2)$$

N = Population size

V = Standard error of sampling distribution = 0.05

$S2 = P(1-P) = (0.5)(0.5) = 0.25$

P = the proportion of standard deviation in the population element (total error = 0.1 at 95% confidence level).

$$n1 = \frac{0.5^2}{0.05^2} \quad (3.3)$$

$$n1 = \frac{0.25}{0.0025} = 100 \quad (3.4)$$

Substituting in equation 3.1;

$$n = \frac{100}{1+\left(\frac{100}{69}\right)} \quad (3.5)$$

$$n = 41$$

2) Sampling method

Statistical Package for Social Sciences (SPSS) was used to get frequency table which in turn was used to analyse the respondents' general information. The factors affecting construction was analysed using frequency tables and a Kruskal Wallis Test was done to determine the difference in perception between the various professions. Relative importance index (RII) and Item Mean was used to rank the factors according to their significance. The RII and Item Mean was done using a programmed Microsoft Excel Sheet and the formula used was

$$RII = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5[n_5 + n_4 + n_3 + n_2 + n_1]}$$

$$Mean = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{Total\ respondents}$$

Where n_5= Frequency of "Strongly Agree" response
n_4= Frequency of "Agree" response
n_3= Frequency of "Neutral" response
n_2= Frequency of "Disagree response
n_1= Frequency of "Strongly Disagree" response
An RII < 0.60 indicates low severity of the factor;
0.60 ≤ RII < 0.80 indicates high severity,
An RII ≥ 0.80 indicates a very high severity of the factor.

Factors used for analysis were divided into three groups as adopted by Hickson and Ellis [30]. Each factor was given a serial number according to the group it belongs. Table 3.1, Table 3.2 and Table 3.3 shows the factors in their various groupings with their serial number.

TABLE 3.1: SITE FACTORS

A	**Site Factors**
A1	Delay in responding to request for information
A2	Rework
A3	Amount of variation/change of orders during execution
A4	Clarity of technical specification
A5	Level of co-ordination among design disciplines i.e. Architects, Engineers, etc.
A6	Compatibility and consistency among contract document
A7	Strict inspection by the engineer
A8	Complexity of the design and project
A9	Restricted access on site
A10	Inspection delay by the engineer
A11	Confinement of working space
A12	Site layout
A13	Mobilization/Demobilization
A14	Hazardous Work Area
A15	Excessive labour/Over-manning
A16	Lack of places for eating and relaxation
A17	Non provision of transport means for workers

TABLE 3.2: HUMAN LABOUR FACTORS

B	**Human Labour Factors**
B1	Shortage of experienced labour
B2	Skill of labour
B3	Lack of competition /motivation of labour
B4	Physical fatigue
B5	Craft workers' pride in their work
B6	Labour disloyalty
B7	Labour dissatisfaction
B8	Increase of labourer's age
B9	Drug abuse and alcoholism
B10	Labour absenteeism
B11	Poor health of workers
B12	Labour personal problems
B13	Poor economic condition of workers
B14	Literacy level

TABLE 3.3: EXTERNAL FACTORS

C	**External Factors**
C1	Rain
C2	High Temperature
C3	Weather and Season Changes
C4	Government polices
C5	Cultural conditions and customs of the community at the project site
C6	Religious holidays/other holidays
C7	Rise in fuel prices
C8	Environmental pollution
C9	Conflict with project stakeholders
C10	Financial Crisis

IV. DATA PRESENTATION AND DISCUSSION

TABLE 4.1 RETURN RATE OF QUESTIONNAIRE

	Frequency	Percentages
Not-Returned	26	39
Returned	41	61
Distributed	67	100

TABLE 4.2: RESPONDENTS' YEARS OF EXPERIENCE

Years	Frequency	Percent
Less than 5	6	14.6
5-10	18	43.9
11-15	10	24.4
More than 15	7	17.1
Total	41	100.0

TABLE 4.3: RESPONDENTS' QUALIFICATION

	Frequency	Percent
Diploma	3	7.3
HND	9	22.0
BSc/BEng	13	31.7
MSc	10	24.4
PhD	1	2.4
Others	5	12.2
Total	41	100.0

TABLE 4.4 PROFESSION IN THE CONSTRUCTION INDUSTRY

	Frequency	Percent
Architect	3	7.3
Builder	11	26.8
Quantity Surveyor	5	12.2
Engineer	14	34.1
Project Manager	1	2.4
Craftsman	2	4.9
Others	5	12.2
Total	41	100.0

TABLE 4.5 SIZE OF THE ORGANIZATION

	Frequency	Percent
Small	8	19.5
Medium	19	46.3
Large	14	34.1
Total	41	100.0

Table 4.1 shows the return rate of response. Sixty-seven questionnaires were distributed. Forty-one questionnaires were retuned while Twenty-six were not, indicating a return rate of 61%.

Table 4.2 shows the years of respondent's experience. More than 50% of the respondents' had at least 5 years of professional experience.

Table 4.3 shows that more than half of the respondents have a qualification of B.Sc/B.Eng or above.

Table 4.4 show that Engineers and Builders made above half of the respondents while table 4.5 shows that the medium sized companies had the highest percentage of respondents.

The characteristics listed above indicates that the respondents possess the requisite knowledge and experience to provide reliable information on which reliable conclusions can be made.

Table 4.6, 4.7 and 4.8 show the ranking of site factors, human labour factors and external factors while table 4.9 show the overall ranking of all the factors. It shows rain, conflict with project stakeholders, skill of labour, financial crisis and government policies the topmost severity.

Table 4.6: Ranking of Site Factors

S/N	Site Factors	RII	Mean	Rank	Grank
A14	Hazardous Work Area	0.790	3.950	06	01
A3	Amount of variation/change of orders during execution	0.766	3.829	08	02
A5	Level of co-ordination among design disciplines i.e. Architects, Engineers, etc.	0.756	3.780	10	03
A6	Compatibility and consistency among contract document	0.756	3.780	11	04
A4	Clarity of technical specification	0.714	3.568	17	05
A13	Mobilization/Demobilization	0.713	3.564	18	06
A2	Rework	0.705	3.525	20	07
A1	Delay in responding to request for information	0.695	3.475	21	08
A8	Complexity of the design and project	0.693	3.463	22	09
A12	Site layout	0.690	3.450	23	10
A7	Strict inspection by the engineer	0.663	3.317	26	11
A10	Inspection delay by the engineer	0.663	3.317	27	12
A9	Restricted access on site	0.659	3.293	30	13
A11	Confinement of working space	0.655	3.275	31	14
A17	Non provision of transport means for workers	0.652	3.261	32	15
A15	Excessive labour/Over-manning	0.610	3.051	37	16
A16	Lack of places for eating and relaxation	0.590	2.951	40	17

Table 4.7: Ranking of Human Labour Factors

S/N	Human Labour factors	RII	Mean	Rank	Grank
B2	Skill of labour	0.800	4.000	03	01
B1	Shortage of experienced labour	0.765	3.825	09	02
B13	Poor economic condition of workers	0.749	3.744	12	03
B3	Lack of competition /motivation of labour	0.740	3.700	13	04
B4	Physical fatigue	0.740	3.700	14	05
B11	Poor health of workers	0.718	3.590	16	06
B14	Literacy level	0.708	3.542	19	07
B7	Labour dissatisfaction	0.662	3.308	28	08
B10	Labour absenteeism	0.662	3.308	29	09
B6	Labour disloyalty	0.651	3.256	33	10
B9	Drug abuse and alcoholism	0.631	3.154	36	11
B12	Labour personal problems	0.605	3.027	38	12
B5	Craft workers' pride in their work	0.605	3.026	39	13
B8	Increase of labourer’s age	0.537	2.684	41	14

Table 4.8: Ranking of External Factors

	External Factors	RII	Mean	Rank	Grank
C1	Rain	0.840	4.200	01	01
C9	Conflict with project stakeholders	0.810	4.050	02	02
C10	Financial Crisis	0.800	4.000	04	03
C4	Government polices	0.795	3.975	05	04
C5	Cultural conditions and customs of the community at the project site	0.770	3.850	07	05
C8	Environmental pollution	0.735	3.675	15	06
C2	High Temperature	0.685	3.425	24	07
C3	Weather and Season Changes	0.685	3.425	25	08
C6	Religious holidays/other holidays	0.650	3.250	34	09
C7	Rise in fuel prices	0.645	3.225	35	10

Table 4.9: Overall Ranking of Factors affecting Construction Productivity

S/N	Factors	Frequency of degree of importance by respondents					N	RII	Mean	R
		5	4	3	2	1				
C1	Rain	17	15	7	1	0	40	0.840	4.20	01
C9	Conflict with project stakeholders	12	23	1	3	1	40	0.810	4.05	02
B2	Skill of labour	8	25	4	2	0	39	0.800	4.00	03
C10	Financial Crisis	11	22	4	2	1	40	0.800	4.00	04
C4	Government polices	12	17	9	2	0	40	0.795	3.97	05
A14	Hazardous Work Area	10	21	6	3	0	40	0.790	3.95	06
C5	Cultural conditions and customs of the community at the project site	8	22	7	2	1	40	0.770	3.85	07
A3	Amount of variation/change of orders during execution	11	20	3	6	1	41	0.766	3.83	08
B1	Shortage of experienced labour	11	20	1	7	1	40	0.765	3.83	09
A5	Level of co-ordination among design disciplines i.e. Architects, Engineers, etc.	11	21	2	3	4	41	0.756	3.78	10
A6	Compatibility and consistency among contract document	9	22	5	2	3	41	0.756	3.78	11
B13	Poor economic condition of workers	8	19	7	4	1	39	0.749	3.74	12
B3	Lack of competition /motivation of labour	5	24	5	6	0	40	0.740	3.70	13
B4	Physical fatigue	7	22	4	6	1	40	0.740	3.70	14
C8	Environmental pollution	7	17	12	4	0	40	0.735	3.68	15
B11	Poor health of workers	9	15	7	6	2	39	0.718	3.59	16
A4	Clarity of technical specification	8	16	4	7	2	37	0.714	3.57	17
A13	Mobilization/Demobilization	8	14	9	8	0	39	0.713	3.56	18
B14	Literacy level	4	12	4	1	3	24	0.708	3.54	19
A2	Rework	2	23	10	4	1	40	0.705	3.53	20
A1	Delay in responding to request for information	7	17	8	4	4	40	0.695	3.48	21
A8	Complexity of the design and project	7	16	8	9	1	41	0.693	3.46	22
A12	Site layout	7	17	7	5	4	40	0.690	3.45	23
C2	High Temperature	9	13	8	6	4	40	0.685	3.43	24
C3	Weather and Season Changes	4	18	10	7	1	40	0.685	3.43	25
A7	Strict inspection by the engineer	11	8	7	13	2	41	0.663	3.32	26
A10	Inspection delay by the engineer	6	16	9	5	5	41	0.663	3.32	27
B7	Labour dissatisfaction	7	12	10	6	4	39	0.662	3.31	28
B10	Labour absenteeism	8	11	8	9	3	39	0.662	3.31	29
A9	Restricted access on site	3	22	6	4	6	41	0.659	3.29	30
A11	Confinement of working space	1	22	6	9	2	40	0.655	3.28	31
A17	Non provision of transport means for workers	2	8	9	2	2	23	0.652	3.26	32
B6	Labour disloyalty	5	15	7	9	3	39	0.651	3.25	33
C6	Religious holidays/other holidays	5	15	10	5	5	40	0.650	3.25	34
C7	Rise in fuel prices	8	8	12	9	3	40	0.645	3.23	35
B9	Drug abuse and alcoholism	7	12	7	6	7	39	0.631	3.15	36
A15	Excessive labour/Over-manning	2	16	6	12	3	39	0.610	3.05	37
B12	Labour personal problems	3	11	12	6	5	37	0.605	3.03	38
B5	Craft workers' pride in their work	3	12	9	11	3	38	0.605	3.03	39
A16	Lack of places for eating and relaxation	6	13	5	7	10	41	0.590	2.95	40
B8	Increase of labourer's age	4	7	7	13	7	38	0.537	2.68	41

5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree, N= Total Respondents, R=Rank

Fig. 4.1: Cluster diagram showing the Relative Importance Index (RII) of the Construction Industry Professionals (Architects, Builders, Engineers & Quantity Surveyors)

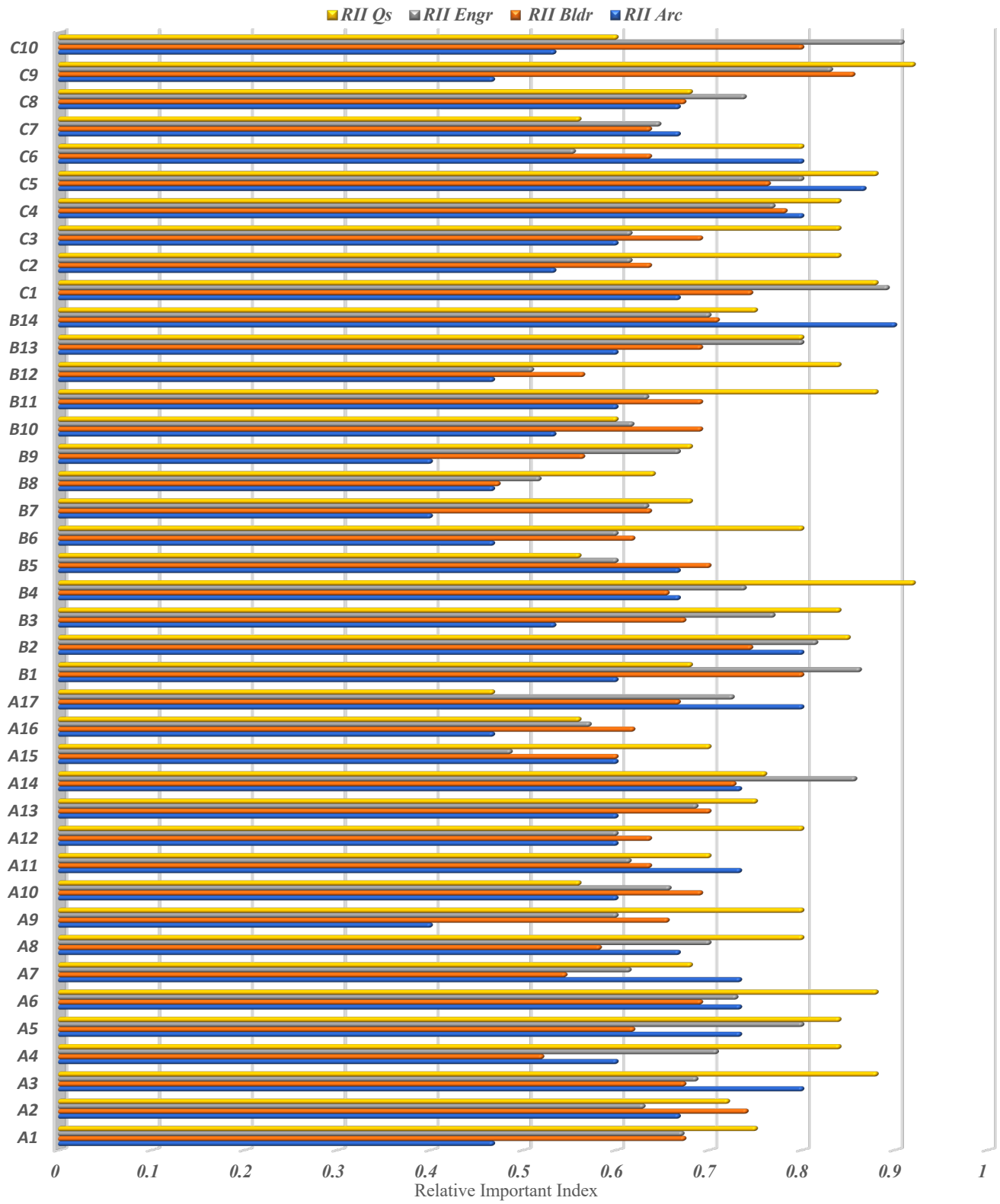

Fig. 4.2: Cluster diagram showing the Relative Importance Index (RII) of Large, Medium and Small companies

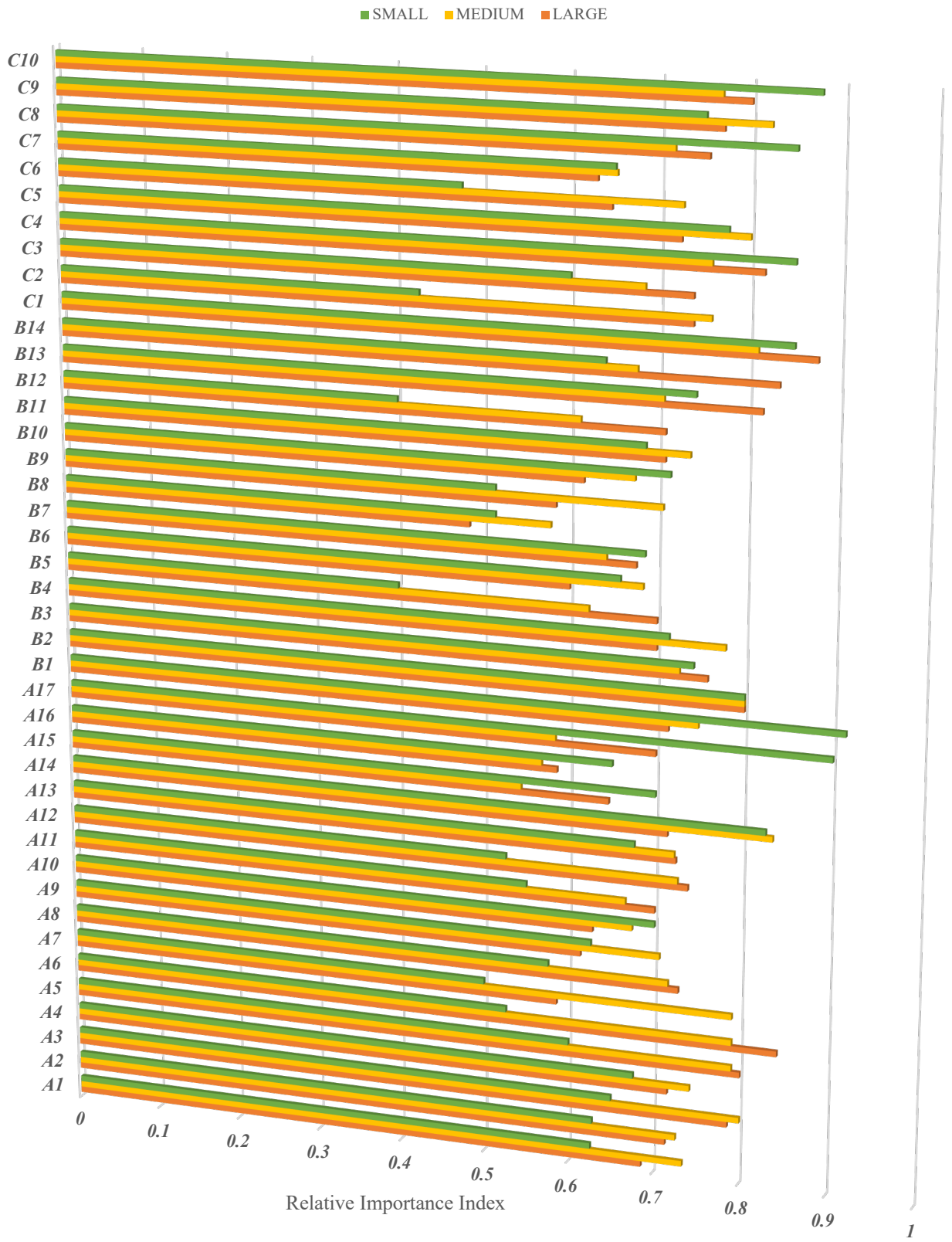

Table 4.10: Ranking for group of factors

Group Code	Group	Average RII	Rank
C	External Factor	0.741	1
A	Site Factors	0.692	2
B	Human Labour Factors	0.684	3

Table 4.10 shows that external factors, site and human factors ranked first, second and third. This indicates that enviroment of work and external factors have more affect on productivity than human labour factors.

Table 4.11 shows the difference in perception between Architect, Builders, Engineers and Quantity Surveyors. The Kruskal Wallis test showed that there was significant difference in perception of the various professionals of thirty-eight factors with p-value ranging from 0.062 to 0.902. However, no significant difference was observed for three factors. These factors are rain, economic crises and labour personal problems.

Table 4.11: Kruskal Wallis Test Results

Factors	Kruskal-Wallis H	Asymp. Sig.	Difference in perception
Delay in responding to request for information	3.646	0.302	Significant
Rework	3.722	0.293	Significant
Amount of variation/change of orders during execution	3.168	0.366	Significant
Clarity of technical specification	2.490	0.477	Significant
Level of co-ordination among design disciplines i.e. Architects, Engineers, etc.	2.521	0.471	Significant
Compatibility and consistency among contract document	3.978	0.264	Significant
Strict inspection by the engineer	1.892	0.595	Significant
Complexity of the design and project	3.987	0.263	Significant
Restricted access on site	4.429	0.219	Significant
Inspection delay by the engineer	1.270	0.736	Significant
Confinement of working space	1.137	0.768	Significant
Site layout	3.068	0.381	Significant
Mobilization/Demobilization	1.059	0.787	Significant
Hazardous Work Area	4.051	0.256	Significant
Excessive labour/Over-manning	5.103	0.164	Significant
Lack of places for eating and relaxation	1.418	0.701	Significant
Non provision of transport means for workers	3.878	0.275	Significant
Shortage of experienced labour	2.763	0.430	Significant
Skill of labour	2.355	0.502	Significant
Lack of competition /motivation of labour	5.770	0.123	Significant
Physical fatigue	6.472	0.091	Significant
Craft workers' pride in their work	0.894	0.827	Significant
Labour disloyalty	4.139	0.247	Significant
Labour dissatisfaction	3.139	0.371	Significant
Increase of labourer’s age	1.575	0.665	Significant
Drug abuse and alcoholism	2.796	0.424	Significant
Labour absenteeism	1.270	0.736	Significant
Poor health of workers	4.231	0.238	Significant
Labour personal problems	8.177	0.042	Not Significant
Poor economic condition of workers	2.951	0.399	Significant
Literacy level	2.918	0.404	Significant
Rain	8.578	0.035	Not Significant
High Temperature	4.183	0.242	Significant
Weather and Season Changes	4.946	0.176	Significant
Government polices	0.354	0.950	Significant
Cultural conditions and customs of the community at the project site	2.548	0.467	Significant
Religious holidays/other holidays	4.734	0.192	Significant
Rise in fuel prices	0.575	0.902	Significant
Environmental pollution	0.811	0.847	Significant
Conflict with project stakeholders	7.319	0.062	Significant
Financial Crisis	14.114	0.003	Not Significant

Table 4.12 Comparison of results with previous research

Authors	Region	Ranking of factors in various studies				
		1	**2**	**3**	**4**	**5**
Current Research	Zaria, Nigeria	Rain	Conflict with project stakeholders	Skill of labour	Financial Crisis	Government policies
Odesola, et al. [22]	Bayelsa, Nigeria	Specifications and standards	Material availability	Project goals	High quality requirement	Non-availability of drawings
Edwin and Calistus [23]	North-central Nigeria	Designs	Change of drawings and specification	Working at high places	Inexperience	Low wages
Olomolaiye, et al. [1]	Nigeria	Low material supply	No working tools	Work repetition	Delays in giving instructions	Delays in inspections
Odesola and Idoro [25]	South-South Nigeria	Craft workers' pride	Lack of skills	Repetition of work	Incompetent supervisors	Individual problems/workers poor condition
Jarkas and Bitar [28]	Kuwait	Non-clarity of Specifications	Variation/change of orders	Non-Coordination among Professionals	Non-Supervision of labour	Work proportion subcontracted
Makulsawatudom and Emsley [29]	Thailand	Low material Supply	Incomplete drawing	Delay in carrying out inspections	Non-competent supervisors	Time for issuing instructions
Hickson and Ellis [30]	Trinidad and Tobago	No supervision of labour	Unrealistic labour performance expectation	Lack of qualified labour	No leadership	Labourer's skill
Gundecha [31]	USA	Lack of material needed for construction	Lack of basic utilities	Accidents on site	Lack of tools	Unfavourable conditions on site
Khaled and Remon [3]	Egypt	Labourer's skill	Lack of Incentive	Material availability & handling	Incompetent site managers	Labour supervision
Enshassi, et al. [26]	Gaza	Material shortages	Labourer's experience	No labour surveillance	Misunderstanding between superintendents and labourers	Drawings alteration during project execution
Thomas and Sudhakumar [27]	India.	Non-availability of material on time	Delay in the supply of material	Strikes	Frequent drawing revisions	Timely availability of drawings at the site
Dixit, et al. [5]	India	Making Decisions	Planning	Logistics	Availability of Labour	Budgetary Issues
Durdyev and Mbachu [32]	Cambodia	Leadership	Planning	Inadequate construction methods	Poor supervision of labour	Lack of effective communication
Afolabi [33]	Nigeria	Availability of material	Poor supervision	Payment Methods	Site welfare	Weather
Ohueri, et al. [34]	Malaysia	Non Effective supervision	Lack of Incentives	Training	Unsafe site conditions	Career Progress
Momade, et al. [35]	Qatar	Achievement	Recognition	Interesting work	Decision making involvement	Personnel development
Alaghbari, et al. [36]	Yemen	Labourer's skill	Material availability	Non-efficient leadership and management	Material availability in the market	Political/security condition
Palikhe, et al. [7]	Nepal	Unavailability of tools on site	Untimely arrival of material	Delay in procurement	No incentive	Delay in payment for materials
Shoar and Banaitis [6]	Lithuania	Unachievable schedule	High number of labour	Rework	Delays in payment of wages.	Overtime
Parath [37]	India	No clear job description	Planning	Worker's skill	No adequate Supervision	Coordination
Bekr [4]	Jordan	Proper planning	Shortage of materials	Shortage of equipment	Non-availability of adequate labour	Inefficient management of sites
Minde [38]	Mumbai, India	Skills of the labourer	Material availability.	Methods of construction	Site Safety	Work schedule.

Results represented on table 4.12 indicates that the factors influencing construction productivity depends on the geographical locations. Climatic conditions, method of construction, material use, availability and technological application as well as contractual procedures are some of the causative agents Gundecha [31].

However, a common factor across most regions and countries is the skill of labour. It ranks third in this research, second in south-south Nigeria, fifth in Trinidad and Tobago, and first in Egypt.

V. Conclusion and Recommendations

An assessment of factors in the construction industry influencing labour productivity in Zaria, Northwestern Nigeria was carried out. The following findings were obtained from the survey.

- The research shows that productivity of labour in the area considered is seriously affected as thirty-nine of the forty-one identified factors indicated high severity.
- Rain, conflict with project stakeholders, and skill of labour ranked first, second and third respectively in the level of severity.
- Architects, Builders, Engineers and Quantity Surveyors all have different perception on the factors affecting construction except for rain, financial crisis and labour personal problems.
- Architects viewed literacy level to be the most important factor, Builders viewed conflict with project stakeholders, Engineers viewed financial crisis to be the most important factor, while Quantity Surveyors viewed physical fatigue to be the most important factor.
- There exists a difference in significance of the factors across the regions and countries except for labourer's skill that ranked third in this research, second in south-south Nigeria, fifth in Trinidad and Tobago, and first in Egypt.
- External factors tend to affect construction labour productivity more than site and human labour factors. This is mostly due to the fact that site and human labour factors can be controlled to some extent by the site engineers but external factors can't really be controlled by the site engineers.

Professionals, especially those managing construction sites should pay more attention to controlling these factors to enhance more productivity on their sites. It is suggested that further studies be carried out on the level of influence these factors have on the productivity of labour.

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