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Influence of Labour-Related Factors on Construction Labour Productivity in the South-South Geo-Political Zone of Nigeria

*Isaac Abiodun Odesola[1] and Godwin Iroroakpo Idoro[2]

Abstract: Construction labour productivity has continued to be investigated because of its importance in national economies. This study assesses and compares the relative effects of labour-related factors on construction labour productivity across the six geographical states that comprise the south-south zone of Nigeria from the perspectives of building craftsmen and project supervisors/engineers. A field survey involving a stratified random sample of 1,138 building craftsmen and 561 project supervisors/engineers was conducted. Data were collected through structured questionnaires and analysed using mean item scores, Kruskal-Wallis H-tests and Mann-Whitney U-tests. The results show that there is no significant influence of labour-related factors on construction labour productivity across geographical states, especially when they seem to be similar in terms of contiguity, linguistics, ethnicity, cultural practices, climate and socio-economic conditions. The two groups of respondents also agreed on the relative effects of labour-related factors on construction labour productivity. This study concludes that, when project locations are similar, labour management practices and productivities do not vary. 13 opportunities related to the management of labour for productivity improvement on building sites were emphasised. The study recommends that improved labour management practices are a potent productivity improvement strategy that will enhance construction labour productivity.

Keywords: Construction, Labour, Productivity, Building craftsmen, Project supervisors/engineers

INTRODUCTION

It has been observed that the construction workforce, especially in developing countries, is not seen as an important input despite labour's generally constituting a large percentage of total construction project costs (e.g., up to 40% of direct cost in large projects) (Kazaz, Manisali and Serdar, 2008). Consequently, labour-intensive industries, such as construction, are considered high-risk by contractors due to their relatively high labour components. Therefore, labour productivity is one of the most important risks in construction projects (Ulubeyli, 2004; Kazaz, Manisali and Serdar, 2008) and understanding the effects of factors affecting construction labour productivity is crucial given labour's relatively variable and high risk compared to other cost components (Hanna et al., 2008).

Park, Thomas and Tucker (2005) remarked that construction productivity is a cause of great concern in both the construction industry and academia. The emphasis on construction productivity is associated with the important contribution of the industry to a national economy and the reported problem of low productivity in the industry. Many researchers have reported a decline in construction productivity (Hewage and Ruwanpura, 2006; Veiseth, Rostad and Andersen, 2003). Lawal (2008) reported that construction workers in Nigerian public service have almost zero productivity. In a nutshell, poor productivity of

[1]Department of Building, University of Uyo, Uyo, Akwa Ibom State,
[2]Department of Building, University of Lagos, Lagos, Lagos State, NIGERIA
*Corresponding author: isaacodesola@yahoo.co.uk

craftsmen has been identified as one of the most daunting problems that construction industries face, especially those in developing countries (Kaming et al., 1997a).

Consequently, there is a growing and continuous interest in productivity studies all over the world because of the importance of labour productivity in the management and control of project costs. Identifying and evaluating the factors that influence productivity are critical issues facing construction managers (Attar, Gupta and Desai, 2012). Hendrickson and Au (2003) maintained that good project management in construction must vigorously pursue the efficient utilisation of labour, material and equipment and that improvement of labour productivity should be a major and continuous concern for those who are responsible for the cost control of facilities being constructed.

The low productivity currently observed in the construction industry is associated with its attendant problems, which include time overruns, cost overruns, disputes and eventual abandonment of construction projects. In separate studies, Kaming et al. (1997b) and Alinaitwe, Mwakali and Hansson (2007) discovered that another problem associated with construction labour productivity is the possibility of its variation across geographical locations. The south-south zone of Nigeria, composed of six geographical states (viz., Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers), was the area selected for this study. The choice of this area was influenced by the reported increase in its volume of construction activities occasioned by popular demands for sustainable development and the subsequent establishment of government ministry and parastatals to carry out the development of the area. In addition, crude oil, which is the nation's major source of foreign earnings, is produced in this area. Consequently, improved construction labour productivity resulting from productivity studies would be pertinent to the delivery of construction projects in this zone, especially given that no such studies have been conducted in this region.

Low productivity in the construction industry, with its attendant problems of time overruns, cost overruns, disputes and eventual abandonment of construction projects, along with poor productivity of craftsmen and the possibility of variation in labour productivity across geographical locations, all contribute to the main problem addressed in this study. Namely, this study sought to determine whether variations in labour-related factors influence construction labour productivity across the geographical states in the south-south geo-political zone of Nigeria. Pursuant to this goal, the study aimed to assess and compare the relative effects of labour-related factors on the productivity of building craftsmen with a view to ascertaining whether said factors could influence construction labour productivity across the geographical locations. The objectives of the study were to evaluate the relative effects of labour-related factors on construction labour productivity from the perspective of project supervisors/engineers and building craftsmen, to compare their perceptions of these relative effects and to assess the variations in the relative effects of labour-related factors across the six geographical states of the zone as perceived by the two groups of study respondents. An improved understanding of the influence of labour-related factors on construction labour productivity across these geographical states would enable construction managers to better account for these factors in the cost control of building projects executed across geographical locations. In the same vein, such a study should also reveal whether labour characteristics and labour

management practices differ across geo-graphical locations. Moreover, comparing the perceptions of building craftsmen and project supervisors/engineers would assist in emphasising factors that significantly affect construction labour productivity and, on the other hand, help to present a holistic approach to tackling labour productivity problems.

REVIEW OF THE RELATED LITERATURE

According to Attar, Gupta and Desai (2012), the identification and evaluation of factors affecting construction labour productivity have long been critical issues facing project managers with respect to increasing productivity in construction. Understanding the critical factors that both positively and negatively affect productivity has been posited to be necessary for the enhancement of construction labour productivity and project performance (Enshassi et al., 2007; Attar, Gupta and Desai, 2012). Reflecting this perspective, Jergeas (2009) reported that there are undue cost overruns, delays and losses of productivity associated with the delivery of major capital construction projects everywhere in the world. Jergeas's study found that researchers and practitioners have identified poor management practices that lead to poor performance, such as scope changes, design errors and omissions, lack of proper planning and scheduling and improper management of tools, equipment, materials and labour, among many other factors. Several insights and recommendations have been proposed which are yet to be implemented in a manner that will result into tangible productivity and expected project performance (Jergeas, 2009). Attar, Gupta and Desai (2012) noted ineffective management to be a primary cause of low productivity and identified a lack of alignment among goals, contractual conflicts, difficulties in measuring productivity, weak commitments to continuous improvement and a lack of labour force focus as barriers to improving productivity.

Enshassi et al. (2007) observed that, despite there having been intensive investigations made into factors affecting labour productivity, researchers have not agreed on a universal set of factors with significant influence on productivity nor has any agreement been reached on the classification of these factors. Those authors, however, grouped factors affecting construction labour productivity into 10 categories: manpower, leadership, motivation, time, materials/tools, supervision, project, safety, quality and external factors. Kazaz, Manisali and Serdar (2008) considered productivity factors under four groups – organisational factors, economic factors, physical factors and socio-psychological factors – deriving these four from the theory of motivation. Jergeas (2009) prioritised 10 areas for construction labour productivity improvement: labour management, conditions and relations; project front-end planning (loading) and work face planning; management of construction and support; engineering management; effective supervision and leadership; communication; contractual strategy and contractor selection; constructability in engineering design; government influence; and modularisation, prefabrication and pre-building in shops. The study emphasised labour management and relations, including working with unions, among other areas for construction labour productivity improvement.

Adamu et al. (2011) identified 10 productivity-influencing factors among operatives in indigenous construction organisations in the north-eastern states of

Nigeria: the absenteeism of gang members, instruction delays, supervisory incompetence, lack of materials, low wage levels, an unfriendly working atmosphere, repetitious work, a lack of proper tools, interference between operatives, changing crew members and inspection delays. The study found that low wages, a lack of materials and an unfriendly working atmosphere most affected productivity. Durdyev and Mbachu (2011) researched key constraints and improvement measures for on-site labour productivity using 56 sub-factors. The factors were identified under eight broad categories of internal and external constraints: project management/project team characteristics, project finance, workforce, labour-related factors, unforeseen events, technology/process, statutory compliance and other external factors.

Attar, Gupta and Desai (2012) identified factors affecting construction labour productivity under 15 categories: design factors, execution plan factors, material factors, equipment factors, labour factors, health and safety factors, supervision factors, working time factors, project factors, quality factors, financial factors, leadership and coordination factors, organisation factors, owner/consultant factors and external factors. The study further recognised some of these factors as being among the top ten to affect the labour productivity of small and medium-sized companies, large companies and all companies in general and it was observed that labour-related factors cut across all groups.

Although labour-related factors featured prominently among those factors identified as affecting construction labour productivity, none of these studies considered their influence on construction labour productivity across geographical demarcations by comparing the views of building craftsmen and site supervisors – important project team members who are directly involved with construction labour productivity matters. A project team is often composed of a design team and a building team (Bender and Darlene, 2002). Depending on the size of the project, the project team usually consists of architects, engineers and other consultants, who produce the construction documents, the owner, who can be a public or private entity that specifies the project requirements and makes funds available for design and construction and the main contractor and subcontractors, who are responsible for the physical construction of the project.

Construction labour productivity is most strongly affected by the management of the labour directly involved in on-site activities. In recognition of this fact, Maloney (1983) remarked that craft workers, the major players to execute construction processes and activities, have a significant influence on construction labour productivity. In the same vein, Dai et al. (2009) considered craft workers to be in the ideal position to know where and how much of site's productivity is lost or could be gained. Because labour productivity involves the management of labour, project supervisors/engineers, who are often regarded as middle-level managers, are responsible for coordinating the instructions passed down from upper-level managers for implementation by the craftsmen. These instructions equally affect construction labour productivity. Therefore, project supervisors/engineers are considered to be important members of the project team insofar as they communicate and implement management's issues and decisions that then affect construction labour productivity. Hence, the United States Agency for International Development (USAID) (2005) posited that project supervisors/engineers are supposed to be jacks of all trades because the success or failure of a project depends largely on their knowledge and experiences.

Therefore, comparing building craftsmen and site supervisors'/engineers' perceptions of the relative effects of factors affecting construction labour productivity will reveal whether there is agreement in the way the two groups view the degree to which productivity factors affect construction labour productivity. Their agreement will help to emphasise factors that should be focussed upon to improve productivity.

On the other hand, because building craftsmen comprise the group directly involved with the issue of productivity, their disagreement may help to identify factors that are most likely being neglected by the project supervisors/engineers who supervise their work. By acknowledging and addressing such factors, project supervisors/engineers can help to provide a holistic approach to tackling construction labour productivity problems on construction sites, which will lead to improved labour productivity. In response to this gap in the literature, this study assesses and compares the relative effects of environmental factors on construction labour productivity as perceived by building craftsmen and project supervisors/engineers across the six states that forms the south-south geo-political zone of Nigeria. In this study, "labour-related factors" refer to all factors associated with the labour force that affect construction productivity. Previous studies have referred to factors relating to labour as "labour-related factors", "labour characteristics", "manpower group" or simply "labour factors" (Enshassi et al., 2007; Durdyev and Mbachu, 2011; Attar, Gupta and Desai, 2012). Insofar as this study focussed on labour productivity, it was considered appropriate to group together all factors relating to labour. 15 labour-related factors affecting construction labour productivity were identified from previous studies and focus group discussions and were assessed for their influence on construction labour productivity across the six geographical states comprising the south-south geo-political zone of Nigeria.

RESEARCH METHODS

An exploratory survey research design involving the use of a structured questionnaire and focus group discussions was employed in this study. Separate focus group discussions, one set composed of project supervisors/engineers and the other of building artisans, were held in May and June of 2011. The groups involved a cross-section of project supervisors/engineers and building artisans for three major construction companies, each operating in all of the six geographical states in the study area, adding up to a total of 36 focus group discussions. A minimum of four project supervisors/engineers and 10 building artisans were asked to participate in the focus group discussions by the company's project managers/representatives. Membership in the groups was based on nominations from a company's project managers/representatives. Participants in the focus group discussions were asked to identify labour-related factors affecting the productivity of construction labour during their site operations. Through the focus group discussions, the researchers established and supplemented information from the literature on labour-related factors affecting construction labour productivity in the study area; these factors were then used in the questionnaire design. The identified labour-related factors were "craft workers' pride in their work", "lack of skills of the worker", "rework", "incompetent supervisors", "labour personal

problems/poor economic condition of workers", "lack of labour experience", "poor health of workers", "attendance at social functions", "labour absenteeism", "labour disputes (e.g., industrial action)", "misunderstanding among labour", "labour disloyalty/labour dissatisfaction", "increased labourer age", "alcoholism and drug abuse" and "lack of competition". The questionnaire used in the study was divided into two major parts (viz., part one and part two). Part one was labelled "general information" and contained 27 questions used to collect data on the respondents' characteristics and the projects' characteristics. Part two was titled "information on factors affecting construction labour productivity" and contained 15 factors, each of which reflected a five-point Likert scale with anchors corresponding to ratings of nil, low, moderate, high and very high. Weights of 1, 2, 3, 4 and 5, respectively, were later attached to these ratings to measure the relative effects of the labour-related factors that were identified as affecting the productivity of construction labour. The populations included in the study were categorised into three groups: public building projects completed between 2007 and 2011 that were executed by small and medium-sized contractors, construction project supervisors/engineers and building craftsmen in the study area. The population was distributed over the three senatorial districts of each of the six states that made up the study area. Reliable data from which the theoretical population size could be obtained was not available; therefore, a pilot study was conducted. A team of six research assistants, consisting of three males and three females, conducted the pilot study in each geographical state in the study area during the months of May, June and July 2011. Members of the team included current graduate students from the Department of Building, University of Uyo, Akwa Ibom State, Nigeria, who were residing in these states. The academic affiliations of these team members, added to the fact that they were residing in these states, aided the study. Participants were provided with inventory sheets to record their findings. The first pilot study was carried out by visiting the relevant government ministries, parastatals and institutions to obtain information on contractors who worked on public building projects between 2007 and 2011. In the second pilot study, identified contractors were visited to obtain records of the number of project supervisors/engineers and building artisans under their employment. From the pilot studies that were conducted, 508 building projects executed by 145 contractors, 1,138 building craftsmen and 561 project supervisors/engineers were identified. These were adopted as the study population frame.

Considering that project supervisors/engineers represent management's views on factors affecting construction labour productivity, their perceptions may be the same or different from those of the building craftsmen. To achieve the objective of the study, two hypotheses were postulated:

1. Building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity do not vary significantly across the six geographical states in south-south zone of Nigeria; and
2. Building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity do not differ significantly.

Out of 1,202 questionnaires administered in the study population through stratified random sampling, 1,043 (628 building craftsmen and 415 project supervisors/engineers) appropriately completed and returned the questionnaires,

which were then used for the statistical analysis. This accounted for 83.29% and 86.77% response rates for building craftsmen and project supervisors/engineers, respectively. The sample size for each stratum of the study population in each of the geographic state was determined using the Taro Yamane formula for finite populations (Udofia, 2011), which states that

$$n = \frac{N}{1+N\,(e)^2}$$

where n is the sample size, *N* is the finite population, *e* is the level of significance (0.05) and 1 is unity.

Carrying out this formula resulted in a total of 1,202, which became the sample size for the study. This sampling technique was adopted to ensure an unbiased representation of the two distinct categories of the study population and the six states that made up the study area.

The questionnaire used for the study was personally administered using four trained field assistants in each state of the study area. This method, though expensive, was favoured because it afforded the field assistants the opportunity to clarify issues that might arise from the respondents with respect to the contents of the questionnaire. The administration of the questionnaire was performed for seven weeks.

The Statistical Package for Social Sciences (SPSS), version 18, was used to analyse the data collected. The relative effects of the labour-related factors on construction labour productivity, tests of variations in the perceptions of building craftsmen and project supervisors/engineers across the six geographical states and tests of differences between their perceptions of the relative effects of labour-related factors on construction labour productivity were analysed using mean item scores (MISs), Kruskal-Wallis H-tests and Mann-Whitney U-tests, respectively. The Kruskal-Wallis and Mann-Whitney tests, being the non-parametric alternatives to analysis of variance and t tests, respectively, were selected as the statistical tool for data analysis because the data were collected on an ordinal scale. Therefore, non-parametric statistics were considered most suitable for the statistical analysis of such data (Pallant, 2007; Udofia, 2011). MIS was obtained by dividing the total score by the number of respondents for each factor. A baseline of MIS = 2.5 was used to determine the significance of the effect of the factors. Factors having an MIS ≥ 2.5 were considered as having significant effect while factors with an MIS < 2.5 as having insignificant effect. This is consistent with the approach adopted in related studies conducted previously (Adamu et al., 2011; Durdyev and Mbachu, 2011).

RESULTS

Results arising from the analysis of the data collected for the study are presented below.

Respondents' Characteristics

Building artisans and project supervisors/engineers sampled in the study possessed work experience that ranged between the intervals of 1–5 years, 6–10 years, 11–15 years, 16–20 years and over 20 years; however, over 60% had work experience greater than 10 years. All of the building artisans sampled in the study had one form or another of formal education, ranging from the Higher National Diploma (HND) to the West Africa Senior Secondary Certificate of Education (WASSCE). The highest academic qualifications of the project supervisors/engineers ranged from Master of Science (MSc) degrees to Ordinary National Diploma (OND) certificates. Therefore, the academic qualifications and work experiences of the respondents of the study could be considered adequate for their opinions to be relied upon. Ankrah (2007) noted that, despite the various perspectives and definitions of culture, a number of themes are common to all of the different interpretations that are fundamental to understanding culture and one of these is that underlying basic problems are common and include relationships to authority, concepts of masculinity and femininity and ways of dealing with conflicts. A culture of deep reference (subservience) and coercion in subordinate-to-superior relationships (and vice versa) is general inherent to the African setting and, more so, in the area used in this study. This could be observed in the relationship between the building artisans and project supervisors and vice versa.

Test for Variations in the Relative Effects of Labour-Related Factors on Construction Labour Productivity

The degree of agreement between the perceptions of building craftsmen and project supervisors/engineers on the relative effects of labour-related factors on construction labour productivity across the six states that constituted the study area was investigated. The purpose of this investigation was to provide a platform upon which inferences could be made as to whether the influence of labour-related factors on construction labour productivity varied across the six geographical states in the south-south zone of Nigeria or whether it could be generalised across the zone. To achieve this purpose, a Kruskal-Wallis test was performed to test the variation of building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity across the six states in south-south geo-political zone of Nigeria. The results of the test are presented in Tables 1 and 2 for building craftsmen' and project supervisors'/engineers' perceptions, respectively, of the relative effects of labour-related factors on construction labour productivity across the states in south-south geo-political zone of Nigeria.

Table 1. Kruskal-Wallis H-Test For Variation in Building Craftsmen' Perceptions of the Relative Effects of Labour-Related Factors on Construction Labour Productivity across the Geographical States in South-South Geo-Political Zone of Nigeria

States in the Zone	***N***	**Mean Rank**	**(χ^2)**	***p*-Value**	**Decision**
Akwa Ibom	15	34.17			
Bayelsa	15	45.90			
Cross River	15	38.13	9.236	0.100	Accept
Delta	15	50.63			
Edo	15	44.20			
Rivers	15	59.97			
Total	90				

**N* = Number of factors

Table 2. Kruskal-Wallis H-Test for Variation in Project Supervisors'/Engineers' Perceptions of the Relative Effects of Labour-Related Factors on Construction Labour Productivity across the Geographical States in South-South Geo-Political Zone of Nigeria

States in the Zone	***N***	**Mean Rank**	**(χ^2)**	***p*-Value**	**Decision**
Akwa Ibom	15	44.90			
Bayelsa	15	52.77			
Cross River	15	42.80	4.997	0.416	Accept
Delta	15	36.83			
Edo	15	54.20			
Rivers	15	41.50			
Total	90				

**N* = Number of factors

The results in Table 1 indicate that the calculated chi-square (χ^2) value of 9.236 was less than the table value of 11.070 and that the asymptotic significance (*p*-value) of 0.100 was greater than 0.05. Pursuant to this, it was concluded that there were no significant variations in the perceptions of building craftsmen on the relative effects of labour-related factors on construction labour productivity across the six geographical states in south-south zone of Nigeria. Similarly, the results of the project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity in south-south zone of Nigeria, presented in Table 2, showed that the calculated chi-square (χ^2) value of 4.997 was less than the table value of 11.070 and that the Asymptotic Significance (*p*-value) of 0.416 was greater than 0.05. Hence, it was also concluded that there was no significant variation in the perceptions of the project supervisors/engineers on

the relative effects of labour-related factors on construction labour productivity across the six geographical states in south-south zone of Nigeria. Consequently, the research hypothesis that project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity do not vary significantly across the six geographical states in south-south zone of Nigeria was retained.

Tests for Differences between Building Craftsmen's and Project Supervisors'/Engineers' Perceptions

To achieve the third objective of the study, the perceptions of the building craftsmen and the project supervisors/engineers on the relative effects of labour-related factors on construction labour productivity in each of the states in the study area and the entire south-south zone were compared for agreement or disagreement. For this purpose, the second hypothesis states the following:

> H_2: There is no significant difference between the perceptions of building craftsmen and project supervisors/engineers perceptions of the relative effects of labour-related factors on construction labour productivity in the south-south zone of Nigeria.

The hypothesis was tested using a Mann-Whitney (U) test for $p \leq 0.05$. The rule for rejecting the hypothesis was that, when $p \geq 0.05$, the test would reject the hypothesis. The results of the test of the hypothesis are presented in Table 3. The results show that building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity are the same across all of the geographical states of the south-south zone of Nigeria. This is indicated by *p*-values ranging from 0.106 to 0.604, all of which were greater than 0.05 – reflecting a 5% confidence level. Along the same vein, comparing their views collapsed across the states revealed that there is no significant difference between building craftsmen' and project supervisors/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity, as indicated by a *p*-value of 0.613. This therefore implies that their views could be considered together when considering measures to be taken to mitigate the effects of significant labour-related factors on construction labour productivity.

Table 3. Mann-Whitney U-Test for Difference in Building Craftsmen' and Project Supervisors'/Engineers' Perceptions of the Relative Effects of Labour-Related Factors on Construction Labour Productivity in South-South Geo-Political Zone of Nigeria

Parameters Tested	Study Area	N	U-Value	p-Value	Decision
Masonry artisans' perception and site supervisors/ engineers' perception	AKS	15	79.000	0.164	Accept
	BYS	15	100.000	0.604	Accept
	CRS	15	91.000	0.372	Accept
	DEL	15	82.500	0.213	Accept
	EDO	15	79.000	0.324	Accept
	RVS	15	73.500	0.106	Accept
	South-South Zone	90	3873.000	0.613	Accept

*AKS = Akwa Ibom; BYS = Bayelsa; CRS = Cross River; DEL = Delta; RVS = Rivers

Selected Project Team Members' Perceptions on the Relative Effects of Labour-Related Factors on Construction Labour Productivity

Having concluded that building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity are the same, the data collected from the two selected groups of project team members were combined. The combined data were analysed to determine the perceptions of selected project team members on the relative effects of labour-related factors on construction labour productivity in the study area. Table 4 shows the results. The results indicate that, out of thirteen significant factors having MISs greater than or equal to 2.5, "craft workers' pride in their work", "lack of skills of the worker", "rework", "incompetent supervisors" and "labourers' personal problems/poor economic conditions of workers" were the first five significant labour-related factors affecting construction labour productivity. Conversely, "lack of competition" and "alcoholism and drug abuse" were the only insignificant labour-related factors, with MISs of 2.41 and 2.49, respectively and were ranked lowest of all the factors.

Table 4. Selected Project Team Members' Perceptions of the Relative Effects of Labour-Related Factors on Construction Labour Productivity in South-South Geo-Political Zone of Nigeria

Labour-Related Factors Affecting Construction Labour Productivity	*N*	1	2	3	4	5	Sum	MIS	Rank
Craft workers' pride in their work	1043	12	60	414	459	98	3700	3.55	1
Lack of skills of the worker	1043	48	143	409	374	69	3402	3.26	2
Rework	1043	128	53	301	546	15	3396	3.26	2
Incompetent supervisors	1043	70	199	270	437	67	3361	3.22	4
Labour personal problems/poor economic condition of workers	1043	13	257	417	333	23	3225	3.09	5
Lack of labour experience	1043	64	178	593	128	80	3111	2.98	6
Poor health of workers	1043	108	200	416	275	44	3076	2.95	7
Attendance to social functions	1043	14	179	753	94	3	3022	2.90	8
Labour absenteeism	1043	7	386	508	106	36	2907	2.79	9
Labour disputes (e.g. industrial action)	1043	50	387	494	91	21	2775	2.66	10
Misunderstanding among labour	1043	79	419	387	141	17	2727	2.61	11
Labour disloyalty/labour dissatisfaction	1043	62	556	195	210	20	2699	2.59	12
Increase of labourer age	1043	51	484	409	70	29	2671	2.56	13
Alcoholism and drug abuse	1043	142	415	349	112	25	2592	2.49	14
Lack of competition	1043	143	483	279	124	14	2512	2.41	15

N = Number of respondents

Discussion of Results

As indicated in the review of the related literature, although few previous studies had compared the perceptions of construction managers to those of construction craftsmen on the relative effects of factors affecting construction labour productivity, none had considered the influence of labour-related factors on construction labour productivity across geographical demarcations. This study has shown that building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity across the six geographical states in the south-south zone of Nigeria are the same. The implication of this is that project supervisors/engineers and building craftsmen do not consider labour-related factors to have influences on construction labour productivity differentially across geographical demarcations. In other words, geographical demarcations do not appear to influence the relative effects of labour-related factors on construction labour productivity.

However, that the opinions of building craftsmen and project supervisors/engineers on construction labour productivity are not affected by geographical demarcations does not agree with the findings of Kaming et al. (1997b), where it was reported that there were significant regional differences detected in production output, skill, motivation of artisans and operatives'

productivity across seven regions in Indonesia. The difference in the results of the two studies could be attributed to similarities in building craftsmen's productivities across the geographical states in the south-south geo-political zone of Nigeria. This supposition is in line with the observation made by Odesola (2012) that, although the country is reputed for its vast cultural and ethnic diversity, geo-political divisions tend to present some communalism in terms of contiguity, linguistics, ethnicity and cultural practices. Along the same vein, the report of Oyelere (2007) – that there is no evidence of significant disparities in labour market outcome across geo-political regions in Nigeria – also lends credence to the findings of this study. The significance of this result is that it will encourage construction managers and policy makers not to concern themselves with the influence of labour-related factors on construction labour productivity across geographical states, especially when those states seem to be similar in terms of contiguity, linguistics, ethnicity and cultural practices.

Furthermore, the results of the study revealed that there is agreement between building craftsmen's and project supervisors'/engineers' perceptions of the relative effects of labour-related factors on construction labour productivity in the study area. The implication of this is that building craftsmen and project supervisors/engineers agree on factors that significantly or insignificantly affect construction labour productivity. Consequently, their opinions can be combined to investigate selected project team members' perceptions of the relative effects of labour-related factors on construction labour productivity. From collapsing the opinions in such a way, the selected project team members were seen to consider "craft workers pride in their work", "lack of skills of the worker", "rework", "incompetent supervisors" and "labour personal problems/poor economic condition of workers" as the five most significant labour-related factors affecting construction labour productivity.

Having pride in one's work is all about expressing an internal satisfaction that comes with the love for a job and the desire to apply one's best effort. Wang (2008) sampled the opinions of craft-workers to identify how off-the-job training affects workers' pride in their jobs and concluded that workers completing off-the-job training have significantly more pride in their work than workers without training. Hence, it could be said that there is a relationship between workers' pride and training, which can affect productivity. In line with Wang (2008), Dai et al. (2009) discovered that "craft workers' pride in their work", "qualified craft workers" and "coordination between the trades" loaded together after Varimax rotation, with "qualified craft workers" having the highest loading. Their findings also indicated that "construction equipment", "project management" and "craft worker qualifications" have the greatest potential to improve project productivity. In agreement with this, craft workers' pride in their work was ranked first among other labour-related factors affecting construction labour productivity in this study.

Olatunji, Aje and Odugboye (2007) reported that there is evidence of acute skill shortage in the Nigerian construction industry: over 7% of the populace mainly depends on their construction industry employment (both as skilled and unskilled manpower). Alinaitwe, Mwakali and Hansson (2007) emphasised that lack of skills is a major problem that seriously affects the time needed to accomplish tasks, the cost of labour and the quality of the resultant products. In their study, a lack of skills among the workers was ranked second out of 36 factors affecting construction labour productivity. Consequently, seeing the "lack of skill of

the worker" ranked second in this study is in agreement with the findings from previous studies.

Rework in construction management research is considered a reflection of waste or non-value adding activity (Ying, 2004). From this perspective, Alarcon (1994) argued that construction activities that are characterised by a high degree of non-value-adding activities lead to low productivity. Thus, process improvement, through identifying and eliminating rework, has a significant impact on productivity (Alwi, Hampson and Mohamed, 2001). Alinaitwe, Mwakali and Hansson (2007) ranked rework third out of 36 factors affecting construction labour productivity in terms of importance, which is in agreement with the result of this study.

According to Makulsawatudom, Emsley and Sinthawanarong (2004), incompetent supervisors work slowly and may be responsible for defective work and inappropriate application of tools and equipment. It was also opined that one cause of this factor is poor human resource management, wherein inappropriate people are promoted to supervisory roles. The results of their study showed that incompetent supervisors ranked third with respect to the influence they have on construction productivity. Hence, the findings in previous studies support the result of this study, which ranked "incompetent supervisors" fourth of all the factors affecting construction labour productivity.

Labourers' personal problems were not considered to be as instrumental as other factors affecting construction labour productivity on building projects in the Gaza strip, where this factor was ranked 42nd out of 45 productivity factors (Enshassi et al., 2007). Accordingly, it was observed that personal problems cause mental distraction from labour and mental distraction affects labour safety more than labour productivity. Nevertheless, labourers' personal problems comprise a factor capable of negatively affecting productivity. Poor economic conditions to which workers are subjected and which might be associated with personal problems were identified as one of the factors affecting construction productivity and were ranked 16th out of 36 productivity factors (Alinaitwe, Mwakali and Hansson, 2007). The lack of importance attributed to this factor in previous studies does not agree with this study, where it ranked fifth out of 15 labour-related factors affecting construction labour productivity. The difference between this study and previous studies may be connected to the high reported level poverty in the study area. According to Jumbo-Ibeakuzie (2008), the south-south zone is reportedly bedevilled by widespread poverty – approximately 50% of the rural population is classified as poor and approximately 29% are completely food insecure; women and youths are highly disadvantaged; there is unfulfilled potential for sustainable development; the future is threatened by environmental degradation and deteriorating economic conditions; the region is marked by a growing problem of youths restiveness, socially disruptive behaviour and crime. In addition, Ibeanu (2006) remarked that the socio-economic conditions in the zone are worrisome because 73% of the people lack access to safe drinking water, approximately 70% of households lack electricity, 94% of the population lacks access to telephones and the primary school enrolment rate is below 40%.

CONCLUSION AND RECOMMENDATIONS

This study concludes that, when project locations are similar in terms of linguistics, ethnicity, cultural practices, climatic conditions and socio-economic conditions, as was the case with the study area, variations in labour management practices tend to have insignificant effects on the productivity of construction labour. In other words, labour management practices in such cases are relatively equivalent and, therefore, construction labour productivities do not vary. Hence, in such cases, construction managers and policy makers may not have to worry about discrepancies in construction labour productivity due to anticipated variations in labour management practices that could have affected project costs across different locations.

It was also concluded that building craftsmen and project supervisors/engineers, who serve as important project team members, emphasised 13 opportunities related to the management of labour for construction labour productivity improvement on building sites. The labour productivity improvement areas are "instilling pride in building artisans through increased workers' participation in decision making", "improving artisan's skills through on-the-job training", "minimising rework through improved supervision and adequate project planning", "recruiting and engaging competent supervisors", "showing concern in addressing labourers' personal problems/poor economic conditions of workers", "using experienced workers", "improved health and safety policies", "obtaining workers' assurances before scheduling them for work, especially on weekends when they are prone to attend social functions", "investigating the causes of worker's absenteeism and taking appropriate measures to minimise it", "maintaining good relationship with labour unions", "promoting good working relationship among workers", "ensuring workers' satisfaction by adequately motivating construction workers and operating satisfactory conditions of service" and "avoiding the use of over-aged artisans". Therefore, the study recommends that improved labour management practices are potent productivity improvement strategies for enhancing construction labour productivity.

REFERENCES

Adamu, K.J., Dzasu, W.E., Haruna, A. and Balla, S.K. (2011). Labour productivity constraints in the Nigerian construction industry. *Continental Journal of Environmental Design and Management*, 1(2): 9–13.

Alarcon, L.F. (1994). Tools for the identification and reduction of waste in construction projects. In L.F. Alarcon (ed.). *Lean Construction*. Rotterdam: AA Balkema, 374–387.

Alinaitwe, H.M., Mwakali, J.A. and Hansson, B. (2007). Factors affecting the productivity of building craftsmen: Studies of Uganda. *Journal of Civil Engineering and Management*, 13(3): 169–176.

Alwi, S., Hampson, K. and Mohamed, S. (2001). Effect of quality supervision on rework in the Indonesian context. *Asia Pacific Building and Construction Management Journal*, 6: 1–9.

Ankrah, N.A. (2007). An investigation into the impact of culture on construction project performance. PhD diss. University of Wolverhampton.

Attar, A.A., Gupta, A.K. and Desai, D.B. (2012). A study of various factors affecting labour productivity and methods to improve it. *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, 1(3): 11–14.

Bender, W.J. and Darlene M.S. (2002). Team building in the construction industry. AACE International Transactions. Available at: http://www.cwu.edu /~benderw/Teambuildingbenderseptelka0119.doc [Accessed on 12 September 2011].

Dai, J., Goodrum, P.M., Maloney, W.F. and Srinivasan, C. (2009). Latent structures of the factors affecting construction labour productivity. *Journal of Construction Engineering and Management*, 135(5): 397–406.

Durdyev, S. and Mbachu, J. (2011). On-site labour productivity of New Zealand construction industry: Key constraints and improvement measures. *Australasian Journal of Construction Economics and Building*, 11(3): 18–33.

Enshassi, A., Mohamed S., Mustafa, Z.A. and Mayer, P.E. (2007). Factors affecting labour productivity in building projects in the Gaza Strip. *Journal of Civil Engineering and Management*, 13(4): 245–254.

Hanna, A.S., Chang, C., Sullivan, K.T. and Lackney, J.A. (2008). Impact of shift work on labour productivity for labour intensive contractor. *Journal of Construction Engineering and Management,* 138(3): 197–204.

Hendrickson, C. and Au, T. (2003). *Project Management for Construction: Fundamentals Concepts for Owners, Engineers, Architects and Builders*. Available at: http.//www.ce.com.edu./pmbook/10 [Accessed on 2 October 2013].

Hewage, K.N. and Ruwanpura, J.Y. (2006). Carpentry workers issues and efficiencies related to construction productivity in commercial construction projects in Alberta. *Canadian Journal of Civil Engineering*, 33(8): 1075–1089.

Ibeanu, O. (2006). *Civil Society and Conflict Management in the Niger Delta: Scoping Gaps for Policy and Advocacy*. Lagos, Nigeria: CLEEN Foundation, 11.

Jergeas, G. (2009). *Improving Construction Productivity on Alberta Oil and Gas Capital Projects*. Available at: http://goo.gl/wqzOGg [Assessed 3 October 2013].

Jumbo-Ibeakuzie, I.I. (2008). Menace of flood and erosion in the Niger Delta of Nigeria. *Proceedings: The World Bank Workshop on Building Resilient Communities: Risk Management and Responses to Natural Disasters*. Bangkok, Thailand, 10–13 June. Available at: http://goo.gl/Sh57K [Accessed on 2 October 2013].

Kaming, P.F., Olomolaiye P.O., Holt G.D. and Harris, F.C. (1997a). Factors influencing craftsmen's productivity in Indonesia. *International Journal of Project Management*, 15(1): 21–30.

———. (1997b). Regional comparison of Indonesian construction productivity. *Journal of Management in Engineering,* 13 (2): 33–39.

Kazaz, A., Manisali E. and Serdar, U. (2008). Effect of motivational factors on construction workforce productivity in Turkey. *Journal of Civil Engineering and Management*, 14(2): 95–106.

Lawal, P.O. (2008). Capacity utilization of construction craftsmen in public sector in north central zone of Nigeria. PhD diss. University of Jos.

Makulsawatudom, A., Emsley, M. and Sinthawanarong, K. (2004). Critical factors influencing construction productivity in Thailand. *The Journal of King Mongkut's University of Technology North Bangkok*, 14(3): 1–6.

Maloney, W.R. (1983). Productivity improvement: The influence of labour. *Journal of Construction Engineering and Management*, 109(3): 321–334.

Odesola, I.A. (2012). Construction labour productivity of masonry operations in south-south of Nigeria. PhD diss. University of Uyo.

Olatunji, O.A., Aje, O.I. and Odugboye, F. (2007). *Evaluating Health and Safety Performance of Nigerian Construction Site*. Rotterdam, Netherlands: CIB World Building Congress, 1176–1190.

Oyelere, R.U. (2007). Disparities in labour market outcomes across geo-political regions in Nigeria: Fact or fantasy? *Georgia Institute of Technology and Institute for the Study of Labour (IZA) Discussion Paper No. 3082*. Available at: http://ftp.iza.org/dp3082.pdf [Assessed on 2 October 2013].

Pallant, J. (2007). *SPSS Survival Manual: A Step By Step Guide to Data Analysis Using SPSS for Windows*. 3rd Ed. Maidenhead: McGraw Hill, Open University Press, 103–104.

Park, H., Thomas, S.R. and Tucker, R.L. (2005). Benchmarking of construction productivity. *Journal of Construction Engineering and Management*, 131(7): 772–778.

Udofia, E.P. (2011). *Applied Statistics with Multivariate Methods*. Enugu, Nigeria: Immaculate Publications Limited, 218.

Ulubeyli, S. (2004). The effect of construction labour productivity on project duration and cost analysis. MSc diss. Akdeniz University.

United States Agency for International Development (USAID) (2005). Construction site supervision and monitoring in Afghanistan. In *Afghanistan Local Government Assistance Project*. Available at: http://goo.gl/DykFa [Accessed on 2 October 2013].

Veiseth, M., Rostad, C.C. and Andersen, B. (2003). Productivity and logistic in the construction industry: What can the construction industry learn from stationary industry? Paper presented at NORDNET 2003. Available at: http://goo.gl/w5h3q [Accessed on 2 October 2013].

Wang, Y. (2008). A quantitative analysis of training outcomes and strategies in the construction industry. PhD diss. University of Kentucky.

Ying, Z. (2004). Significant factors affecting construction productivity. MEng diss. National University of Singapore.