An Investigation into Factors Affecting the Performance of Public Construction Projects in Ondo State, Southwestern, Nigeria

Helen Ifedolapo Babalola[*]   Oyewale Julius Ojo

Department of Project Management Technology, Federal University of Technology Akure, Ondo State, Nigeria

Abstract

This paper investigates the key performance indicators affecting Public Construction Projects in Akure, Ondo State Southwestern Nigeria. The study adopted a source technique with the administration of a well structured questionnaire to professionals in the construction industry. Descriptive statistical techniques such as frequency distribution, percentages and Relative Importance Index (RII) were used to analyze the data. The study revealed the top ten (10) most important factors influencing the performance of construction projects in Akure. These factors included: delay in progress payment to Contractors, Client's interference during construction, Client's inability to brief the project objectives and escalation of materials prices. Other factors were Client's experience whether he is sophisticated or specialized; complexity of project; motivating skill of the project team leader; project team leader experience; Contactors commitment to ensure construction work is done according to specification as well as Client's inability to make project decision. The paper concluded that the Contractors and Clients performance of the industry is below expectation.

Keywords: Construction projects, Escalation, Performance, Public, Ranking

1. Introduction

The Construction industry deals with large number of players who have massive effects on a nation's economy. These players include Consultants, Clients (owner) and Contractors. The roles the stakeholders play in the industry have effects on the performance of projects. Construction projects such as residential construction, construction of commercial building, and heavy engineering construction such as infrastructure, roads, industrial and development of new facilities, industry and management differ widely in terms of size, nature, location and in performance. Enshassi *et al*. (2009) and Mamman and Omozokpia (2014) stated that construction industry is complex in nature because it involves large number of project stakeholders as Consultants, Clients, Contractors, stakeholders, shareholders and regulators to achieve a successful completion of a project. Regardless of this complexity, the construction industry plays a major role in the development and achievement of project performance in the society. For instance, Chitkara (2004) stated that the construction industry accounts for 3% - 9% of the Gross Domestic Product (GDP) of many countries. He further established that performance of projects can be improved through knowledge in the construction industry, where men, materials, machinery, money and management work together to build a facility. Mamman and Omozokpia (2014) also argued that the overall success of a project is determined to a large extent by the proper management of the resources which are considered as an essential aspect of project implementation. They went further to say that if the resources are adequately used and controlled, issue that relates to cost overrun would not arise. This could however result to variations and claims.

According to Durdyev *et al*. (2012), there are various critical problems facing construction contractors in the construction industry, but one of the most significant according to the authors' points of view is low productivity. Also, Callistus *et al*. (2014) stated that there is need to evaluate the critical factors affecting the quality performance of contractors as they constitute a greater percentage in developing countries. However, Sweis *et al*. (2014) said that contractor is employed by client to fulfill a contract and finish a project within a stipulated time. They added that construction projects require resources that contractors are unable to provide, in such cases, subcontractors are used. As competition in the construction industry is increasing daily, every organization in the industry must measure its performance. (Kulatunga *et al*., 2005) as quoted in Sweis *et al*. (2014). Also in Baldwin *et al*. (2001) as cited in Sweis *et al*. (2014) reiterated that no improvement in any business can be gained unless its performance is measured. The measurement of performance is a standard for measuring the progress of an organization. (Rose 1995) as quoted by Sweis *et al*. (2014). Amusan (2014) stated that Construction industry had been a major source of employment for 70% of labour force in the country, thus it controls the capital flow, as well as labour resources, which has cost implications. He went further to say that adequate management of these resources is considered an important aspect of project works. While several researches had been conducted on labour productivity, only a few have addressed the issue of productivity in developing countries like Nigeria. This paper builds on the vast amount of publications in order to identify a comprehensive list of factors affecting the performance of construction projects. Depending on the situation, factors affecting labour productivity may vary. This study therefore identified factors affecting performance of public construction projects in the state and as well provided adequate information on the factors affecting the performance of construction projects in the study area.

2. Review of Related Literature

Various researchers all over the globe had conducted series of studies to examine factors influencing the performance of construction projects. For instance, Callistus *et al*. (2014) concluded that the factors affecting quality performance of construction firms in Ghana based on Consultants and Contractors view are: fraudulent practices and kickbacks, lack of coordination between designers and contractors, poor monitoring and feedback. Lack of training on quality for staff, lack of management leadership as well as lack of previous experience of contractor was also identified.

As claimed by Amusan (2014) in Nigeria, factors affecting Construction Cost Performance of Projects include: Contractor's inexperience, inadequate planning, Inflation, incessant variation order, and change in project design. Other factors include, Project complexity, shortening of project period and fraudulent practices. Also, Ahadzie (2011) in Ghana stated that most commonly occurring and also leading factors to poor performance are poor project documentation, excessive bureaucratic conditions and over reliance on casual labour. Similarly, Mamman and Omozokpia (2014) claimed that the most important factors agreed by owners, consultants and contractors as the main factors affecting the performance of construction projects were availability of personnel with high experience and qualifications, quality of equipment and raw materials in project. Other factors include conformance to specification, planned through project duration, average delay in payment from owner to contractor, information coordination between client and project parties. Iyer and Jha (2005) identified seven critical success factors affecting performance in India which includes project manager's competence, top management support, project managers coordinating and leadership skill. Others include top management and owner involvement in the project, interaction between project participants, monitoring and feedback by project participants, owner's competence and favourable climatic condition.

Other critical failure factors identified by the authors are: conflict among project participants, ignorance and lack of knowledge, indecisiveness, hostile social economic and climatic condition. Reluctance in timely decision, aggressive competition at tender stage and short bid preparation time were also identified. However, they concluded that the most important factor among all success and failure factors is coordination among project participants. Enshassi *et al*. (2009) concluded that delays, unavailability of resources, low level of project leadership skills, escalation of material prices, unavailability of highly experienced and qualified personnel and poor quality of available equipment and raw materials are affecting the performance of construction projects in the Gaza strip. Based on this fact, the research identified and ranked the factors recognized from related literature according to their relative importance on the factors affecting the performance of construction projects in the study area.

3. Methodology

3.1 Research Design

The study adopted a survey technique through the administration of a well structured questionnaire on the professionals in the industry.

3.2 The Study Area

Ondo State, generally referred to as the "Sunshine State" was created from defunct Western Region on the 3rd of February, 1976. The State is located on latitude 7°10N and covers a land scale area of 14,793 square kilometers and contained 18 local government area with its administrative capital located at Akure town. Ondo State is located within southwest geopolitical zone of Nigeria and bounded in the North by Ekiti and Kogi States, in the East by 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 (National Population Commission of Nigeria, 2006). The ethnic composition of Ondo State is largely from the Yoruba sub-groups of the Akoko, Akure, Ikale, Ilaje and Ondo (Dada *et al*., 2015).

Ondo State is an urban area in which Akure is one of its local governments. The city involves in construction projects such as residential construction, construction of commercial building such as the newly constructed dome at Alagbaka and heavy engineering construction such as roads, industrial and development of new facilities, industry and management.
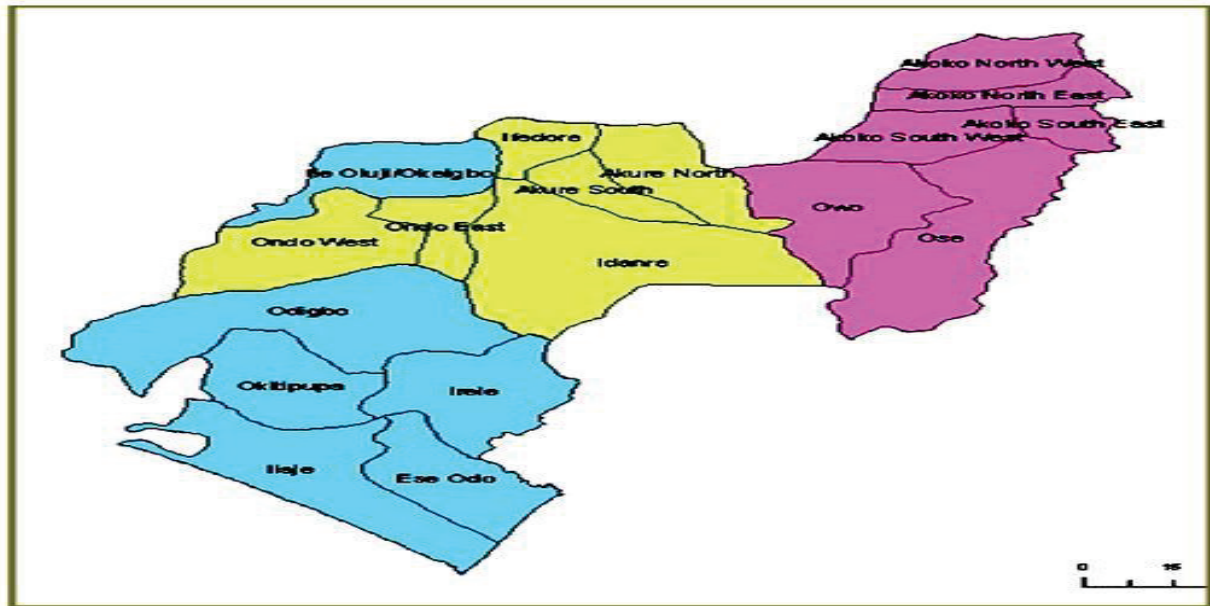
Figure 1. Map of Ondo State
Source: Google Map, 2015

3.3 Study Population, Sample Size and Sampling Technique

The population of this study consists of all the professionals in the study area who are Consultants, Clients and Contractors. According to Kothari (1990), non probability sampling which is also known by different names such as deliberate sampling, purposive sampling and judgment sampling in which items for the sample are selected deliberately by the researcher's choice which remains supreme was adopted. Based on this, 50 copies of a questionnaire were administered to professionals.

3.4 Data Collection Approach

Data for the study were derived from both primary and secondary sources. The primary data were obtained from structured questionnaire designed in Likert Scale in rating Scale of 1to5. The secondary data for this study were obtained from various publications such as relevant journals, textbooks and conference proceedings. The questionnaire was designed to elicit information on the attitude of professionals towards the factors influencing the performance of construction projects in the study area. The factors considered were grouped into: Project related, labour and materials related, contractual relationship, Consultants related, Clients related as well as Contractors related. The designed questionnaire was divided into two. Part A covers the social economic characteristics of the respondents. Part B examined the respondents' view on factors influencing the performance of construction project in Akure Southwestern, Nigeria. A total of 40 copies of questionnaire were distributed and completed by professionals working on different public projects in the study area.

3.5 Data Analysis Techniques

Descriptive statistics was used in this study. The descriptive data analysis involved frequency, tables, percentage and relative importance index. The relative importance index method (RII) was used to determine the Consultants, Clients and Contractors perceptions of the relative importance of the identified key performance factors. The index was adopted from Cheung *et al*. (2004); Iyer and Jha, (2005); Haupt, (2007); Enhassi, (2009) and Mamman and Omozokpia. (2014).

$$RII = \frac{\Sigma W}{A \times N} \tag{1}$$

Where W is the weight given to each factor by the respondents and ranges from 1 to 5, A is the
highest weight, which is 5 and N, is the total number of respondents.

4. Results and Discussion

4.1 Proportionality distribution of Respondents by Profession

Out of a total of fifty (50) copies of questionnaire that were administered, 40 (80%) response rates were completed, retrieved and found useful for the analysis. Majority (50%) of the respondents were Contractors as many of them were always on site. The response rates from Consultant and Client were 30% and 20%
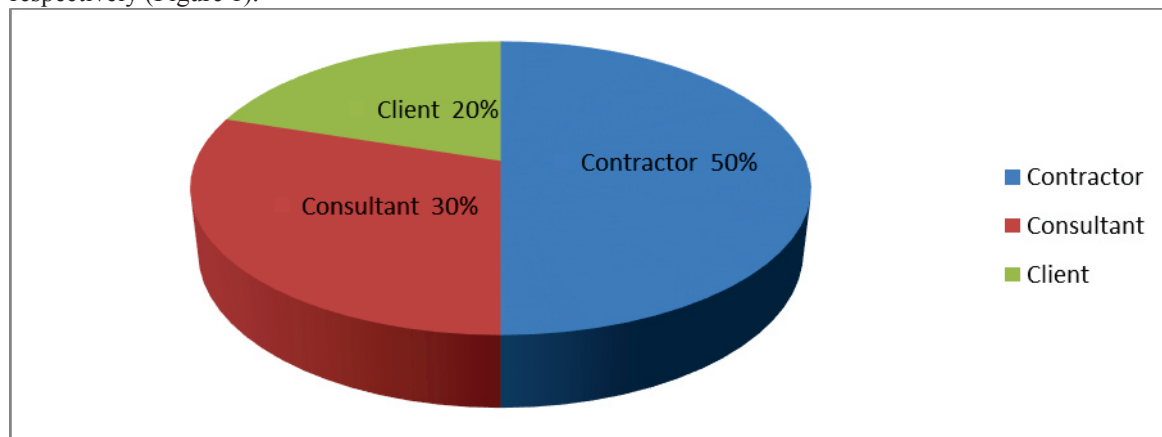
respectively (Figure 1).

Figure 2. Distribution of Respondents by Profession (%)
Source: Field Survey, 2015.

4.2 Socio-economic characteristics of the Respondents
The Socio-economic characteristics of the respondents that were determined in the study includes gender, work experience (years), Academic qualifications, Type of professions. Out of the forty (40) respondents who participated in this study, 80% were male while 20% were female. This may be due to the fact that men are more into construction works and processes than women. Also in this study, it was found that 75% were working in public sector while 25% were working in the private sector. This finding supports the research by Omran *et al*. (2012).

In terms of qualification, Figure 2 illustrated that 2 (5%) had HND, 30 (75%) had Bachelor or equivalent degree while 8 (20%) had master or above.
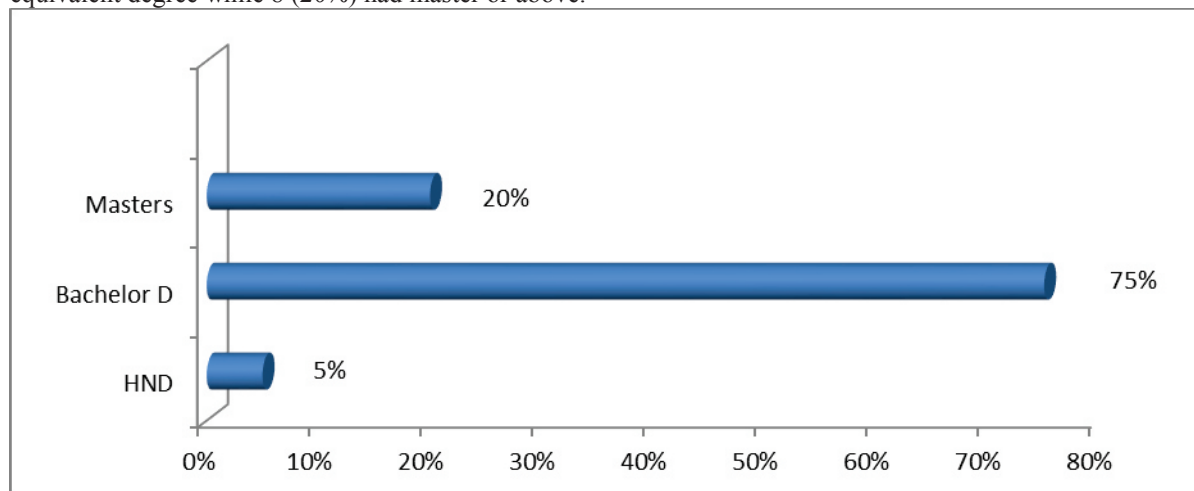

Figure 3. Qualification of Respondents (%)
Source: Field Survey, 2015

The information of the respondents' years of working experience was also stated in Figure 3 below. The data shows that most workers had experience from 10-14years. The Figure also indicated that 10(25%) had been working for less than 5years, 8(20%) illustrated that they had been working between 5-9 years, 5(12.5%) showed that they had been working between 15 19 years and 20 years respectively.
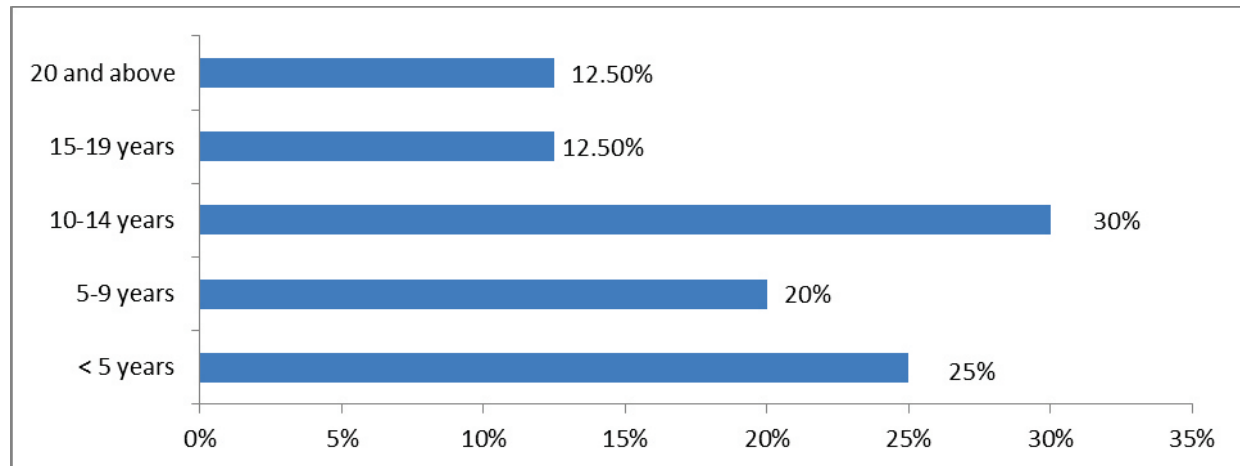
Figure 4: Working Experience of Respondents
Source: Field Survey, 2015

4.3 Relative Importance Index on factors affecting the Performance of Public Construction Projects in the study area.

Table 1: Relative Importance Index on factors affecting the performance of public construction projects

Table 1 below presents list of thirty five factors according to each category. In each of the categories, calculated RII were ranked based on their RII value.

FACTORS	MEAN RANK	RII	RELATIVE RANK
Project Related Factors			
Complexity of project	4.475	1.0415	1st
Nature of project	4.425	1.0183	2nd
Completion period given for the contract not okay	4.375	0.9954	3rd
Type of project	4.325	0.9728	4th
Size of project	4.325	0.0520	5th
Labour and Materials Related Factors			
Escalation of materials prices	4.725	1.0667	1st
Insufficient supply of materials	4.600	1.0110	2nd
Quality control of materials	4.550	0.9891	3rd
Skillful workers	4.425	0.9355	4th
Contractual Relationship			
Overall management actions	4.500	1.0080	1st
Communication system among project participants	4.475	0.9972	2nd
Feedback capabilities between project participants	4.475	0.9972	2nd
Control mechanism of the project activities	4.475	0.9972	2nd
Consultant Related Factors			
Consultant not commitment to ensure construction work is done according to specification	4.550	1.0280	1st
Lack of cooperation to solve problems	4.475	0.9944	2nd
Inadequacy of design and specification	4.475	0.9944	2nd
Consultant not involved in monitoring the project progress	4.450	0.9834	4th
Clients Related Factors			
Delay in progress payment to Contractors	4.550	1.1719	1st
Client interference during construction	4.400	1.0960	2nd
Clients inability to brief the project objectives	4.350	1.0712	3rd
Client experience whether he is sophisticated or specialized	4.325	1.0589	4th

Client inability to make project decision	4.250	1.0225	5th
Client emphasis on quick construction instead of quality	4.225	1.0105	6th
Client emphasis on low construction cost	4.025	0.9171	7th
Size of Clients organization	3.500	0.6935	8th
Contractors Related Factors			
Motivating skill of the project team leader	4.575	1.0405	1st
Project team leader experience	4.550	1.0292	2nd
Technical skill of the project team leader	4.525	1.0179	3rd
Project team leader not commited to meet cost, time and quality	4.475	0.9955	4th
Project team leaders not in good working relationship with others	4.475	0.9955	4th
Inability to control sub-contractors work	4.475	0.9955	4th
Project team leader early and continuous involvement in the project	4.475	0.9955	4th
Implementing an effective safety quality assurance program	4.475	0.9955	4th
Organizing skill of the project team leader	4.450	0.9845	9th
Planning efforts	4.375	0.9515	10th

Source: Researchers Fieldwork, 2015

From the first group, complexity of project, nature of project and completion period given for the contract with RII value 1.0415, 1.0183 and 0.9954 in that order were rank in the 1st, 2nd and 3rd position. For labour and materials related factors, escalation of materials prices, insufficient supply of materials and quality control of materials were ranked 1st, 2nd and 3rd with RII 1.0667, 1.0110 and 0.9891 respectively. In contractual relationship, overall management was ranked first with RII equals 1.0080 while communication system, feedback capabilities and control mechanism were ranked 2nd with RII value of 0.9972 respectively. Consultant commitment and cooperation to solve problems were ranked 1st and 2nd with RII 1.0280 and 0.9944 in that order. Delay in progress payment, Clients interference during construction and Clients inability to brief the project objectives were also ranked with RII 1.1719. 1.0960 and 1.0712 respectively under the Clients related factors. However, motivating skill of the project team leader, project team leader experience and technical skill of the project team leader were ranked 1st, 2nd and 3rd with RII 1.0405, 1.0292 and 1.0179.

From this analysis, the study showed that three factors under Client related factors have the highest relative importance index. This study therefore revealed that most of the factors influencing the performance of construction projects in the study area are caused by Clients.

4.4: Top ten significant factors affecting the Performance of Construction Projects in Akure

Table 2: First ten Significant Factors affecting the Performance of Construction Projects in Akure

Table 2 below revealed the top ten significant factors influencing the performance of construction projects in the study area which was extracted from Table 1.

S/N	Factors	Categories	RII	Ranking
1	Delay in progress payment to contractor	Client related factor	1.1719	1st
2	Client interference during construction	Client related factor	1.0960	2nd
3	Client inability to brief the project objectives	Client related factor	1.0712	3rd
4	Escalation of materials prices	Labour and materials factor	1.0667	4th
5	Client experience whether he is sophisticated or specialized	Client related factor	1.0589	5th
6	Complexity of project	Project related factor	1.0415	6th
7	Motivating skills of the project team leader	Contractor related factor	1.0405	7th
8	Project team leader experience	Contractor related factor	1.0292	8th
9	Consultant not committed to ensure construction work is done according to specification	Consultant related factor	1.0280	9th
10	Client inability to make project decision	Client related factor	1.0225	10th

Source: Researchers Fieldwork, 2015

The outcome of the study showed that the values for the relative importance index ranges from 1.0225-1.1719 where delay in progress payment to contractors has the highest RII. Each of the top ten factors is discussed below.

4.3.1 Delay in Progress Payment to Contractor

As shown in Table 2, delay in progress payment to contractors has been ranked by the entire project participant in the first position with RII equivalent to 1.1719. As the most important key factor influencing the performance of construction project, it affects the stipulated time in which project should be delivered. Mamman and Omozokpia (2014) are in agreement with this result.

4.3.2 Client interference during construction

Client interference has been ranked by all the respondents in the 2nd position with RII equals 1.0960. Interference of Client during construction affects the performance of Contractor output.

4.3.3 Client inability to brief the project objectives

This factor has been ranked as the 3rd with RII equals 1.0712. This factor is very important to contractor as it affect his performance. Client should be able to brief the contractor the objectives of the project which the Contractor can work on to achieve his performance.

4.3.4 Escalation of materials prices

From Table 2 above, escalation of materials prices was ranked by the respondents in the fourth position with RII equals 1.0667. Increase in materials prices affect both the client and the contractor which in turns leads to projects been finished with poor output which eventually affect the performance of the project. The result is in line with Enshassi et al, escalation of material prices affects the liquidity of owners and the profit rate of contractors.

4.3.5 Client experience whether he is sophisticated or specialized

This factor has been ranked as the 5th with RII equals 1.0712.

4.3.6 Complexity of project

Table 2 showed that complexity of project has RII value equals 1.0415. Complexity of project affects the level of overall performance of project. Level of project complexity correlate with experiences required for supervision and skills needed to monitor and supervise project performance.

4.3.7 Motivating skills of the project team leader

Motivating skills has been ranked as the 6th factor with RII equals 1.0405. For good project performance, project team leader should be good enough to motive his employees with incentives to encourage and boast their morale.

4.3.8 Project team leader experience

Project team leader experience was ranked as the 8th factor out of the thirty-five factors with RII equivalent to 1.0292. For an effective project performance, the leadership experience is very important. This will assist both the Contractors and Consultants to supervise the project with strong and proper hands which in turns result in good performance. However, Oman *et al.* (2012) stated that experience of project team leader has been widely accepted as of paramount importance in determining the success of various construction projects.

4.3.9 Consultant not committed to ensure construction work is done according to specification

This has been ranked by all the project participants in the 9th position with RII equals 1.0280. This factor is vital to owners as it has to do with their satisfaction. For a good project performance, the satisfaction of the Client must not be overlooked. Mamman and Omozokpia (2014) are in agreement with this result.

4.4.0 Client inability to make project decision

Project decision has been ranked as the 10th factor influencing the performance of construction project with RII equals 1.0225. This factor is very important as it affects both the Clients and Contractor. Clients should be bold enough to make decision that will affect the performance of project which will enable the Contractor to achieve his project goals.

Table 3: Relative Importance Index and rank of major groups affecting the performance of construction projects in the study area

Groups	RII	Rank
Clients related factors	1.005	1st
Labour related factors	1.001	2nd
Contractual related factors	1.000	3rd
Consultants related factors	1.000	3rd
Contractors related factors	1.000	3rd
Project related factors	0.816	6th

Source: Researchers Fieldwork, 2015

As shown in Table 3 above, Clients related factors was ranked by all the project participants with

highest RII equals to 1.005. This is the top important group that is influencing the performance of public construction project because the 1st, 2nd, 3rd and the 5th factors out of the top ten factors influencing the performance of construction projects in the study area are from this group.

Clients in the study area are enjoyed to cooperate with other project participants to ensure quality performance of public construction projects.

5. Conclusion and Recommendations

The important issue focused on in this study was an investigation into factors influencing the performance of public construction projects in Akure, Ondo State, southwestern, Nigeria. Based on the result of the study, Client related factors; majorly in form of delay in progress payment to contractors was one of the major factors affecting poor performance of construction project in Akure. Based on the findings and conclusion, the paper makes the following recommendations. Client should pay contractors progress payment on time to overcome delay, dispute and unnecessary claims; the Clients should also reduce the level at which he interferes during construction processes in order to achieve better performance and minimize dispute; he should be able to state in details the project objectives which will assist the Contractor to achieve desired performance and finally Contractors in the study area should have at least 50% stock pile of their materials before the commencement of project. This is to check for escalation of market prices of construction materials.

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