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ASSESSMENT OF RISK FACTORS AFFECTING COST PERFORMANCE OF PUBLIC CONSTRUCTION PROJECTS IN KOGI STATE CONTRACTORS AND CONSULTANTS PERSPECTIVES.

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Introduction

Risk is inherent in all human endeavours and construction projects are no exception as they involve activities that are prone to different type of risks (Ogunsanmi et al .2011). when comparing construction industry to other industries, it is subject to more risk and uncertainty due to the unique features of construction activities (Smith, 2003). Project activities are also carried out by different parties and each of the activities has its own risk, which result in accumulated associated risk for the project (Al – sobiei 2005). Jackson (2002) argued that the challenge facing the industry is how to manage the risks of cost overruns and deliver the project within budget and schedule. Haseeb et al.(2011) opined that risks affect construction sector

Abstract

Construction project in Nigeria like other developing countries, are dramatically experiencing a highly risk prone, due to their complex and dynamic environments. Thus such nature of creating an atmosphere of high uncertainty and risks. This consequently leads to cost overrun and time overrun. This study aim at assessing the risk factors affecting cost performance of public construction projects from contractors and consultants perspectives with the view to identify the risks factors affecting cost performance of public construction projects and to assess those major risk factors affecting cost performance of public construction projects in kogi state from contractors and consultants' perspective. extensive literature review was carried out to

assess the risk factors affecting cost performance of public construction projects. based on the comprehensive assessment of the risk factors, fifty (50) factors were identified. A purposive survey of 120 valid responses comprising 68 contractors and 52 consultants was carried out with structured questionnaire. Data obtained were analyzed using mean item score and simple percentile. The result revealed that thirteen factors have very high significant effect on the cost performance of public construction projects in the study area. The study also revealed that there is high perceptions of the effect of the cost performance of public construction. The study therefore recommends that contractors and consultants should focus on risk related to finance, contractor's site management environment, project design, human and non human resources as good planning and management of these risks could reduces the effect and enhance the possibility of achieving the overall project cost performance.

Keywords: *consultants, contractors, cost performance, construction projects, risk management*

negatively and focusing on risk reduction measures is important. The construction industry at present in many countries of the world is facing a lot of criticisms as cases of poor cost performance of construction projects mostly is always being reported (Odeh and Bataineh 2002; Takin and Akintoye; 2002; Chan et al . 2003; Dahiru Mohammed,2012). A comprehensive research made on cost overruns in global construction revealed that 9 out 10 projects had overruns (Flyubjerg et al .2002). the trend of overruns is more severe in developing countries where these overruns exceed 100 % of the anticipated cost of the project (Azhar et al .2008). in Nigeria projects are hardly finished without exceeding initial cost especially in public projects. Omoregie and Radford (2006) earlier reported 14 % as the minimum average percentage of construction projects cost overrun in Nigeria. Ghosh and Jinfanapakanont (2004) blamed the failure of construction projects sometimes to achieve their time, quality and budget goals, partially due to the failure of the contractors to analyze and assess unanticipated dangers are risks inherent in construction production components (Kaming et al . 1997 and Al – Momani, 2000) which affect cost performance and overall project cost.aim, the objective of the study are to

identify the risk factors affecting cost performance of public construction projects and to assess those major factors affecting cost performance of public construction projects in kogi state contractors and consultants perspective.

LITERATURE REVIEW.

Cost performance.

Costing is among the major consideration throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the driving force of project success (Memon et al. 2010). Choge and Muturi (2014) attributed the key importance of cost in construction to scarcity of financial resources. Committed into construction project especially in the developing countries. The performance of cost in a given project is a degree of achievement of cost objectives by comparing final cost against budget. A project is considered successful if the project is completed within a stated budget or cost. However, cost is affected by a large number of factors because of the fact that construction is multidisciplinary industry, complex in the problem of inaccurate cost performance has remained a major challenge to the quantity surveyors in the developing countries like Nigeria due to unanticipated risks in construction especially now that construction is becoming complex and the clients are getting more sophisticated in their demands. The limited information of project parameters available at the pre-contract stage often time resulted into quantity surveyors making assumptions about the project design details which may not evaluate as project design, planning and construction evolve (Liu and Zhu, 2007). The contractors and consultants have not given adequate attention to evaluate the risk factors associated with cost performance and this is one of the major reasons why the overall project costs are hardly achieved in the construction industry. The problem of cost performance are reflected in the increasingly large number of projects being completed behind schedules, over budgets and misallocation of scarce resources. The focus of the study is therefore to assess the risk factors affecting cost performance of public construction project in kogi state contractors and consultants perspective with the view to overcome the problem of poor cost performance in the construction industry. In order to achieve this nature and its work involve money parties such as the owner and various professionals

contractors and suppliers Chan and Park, 2005; Ghoddousi and Housseini (2012). Takim and Akintoye (2002) in their study revealed that the construction industry is generally considered to have underperformed compared to other industries. The performance of the construction is therefore a major source of concern to both public and private sector clients (Okuwoga, 1998). Lack of effective management of cost could be a major constraint in a project and could lead to undesirable result. Cost overrun is a common phenomenon especially when this situation occurs. Cost overrun is almost associated with nearly all projects in the construction industry (Azhar et al. 2008). the cost overruns are major problem especially in the developing countries where overrun sometimes exceed 100 % of the anticipated project cost. Construction projects in Nigeria are mostly completed outside budget due to improper management of risks associated with the various project cost centre's. to prevent poor cost performance, early assessment and evaluation of potential risks is paramount and must be given adequate attention during project implementation. The study submit that if cost related factors of construction costs can be effectively managed, the overall project cost performance can be achieved.

Risk Management in construction.

Risks are an inseparable part of construction project (Makui et al . 2009) and there is no construction project that is risk free. Construction projects are subject to certain degree of risk in project life cycle and project management body of knowledge (2008) also confirmed that most medium to high complexity projects carry some degree of risks. Resulting in the failure of many projects to meet time schedules, targets of budget and sometimes even the scope of work (Ehsan et al . 2010). While risk cannot be eliminated successful projects are those where risks are effectively managed of which early and effective identification and assessment of risks is essential (Smith, 1999). Risks is characterized by the risk event, its probability occurrences and the amount of potential loss or gain. Management is designated as one of the nine key areas of the project management body of knowledge (PMBOK, 2008) by the project management (PMI).risk management is a system which aims to identified and quantify all risks to which the business of project is exposed to s that a conscious decision can be taken on how to manage the risk (Flanagan and Norman, 1993). Risk management in the construction project

management context is a systematic way of identifying and classifying, analyzing and evaluating the risks associated with a project so that responses can be given in order to achieve the project objectives and identifies the characteristics of those risks and it is the responsibility of all members of the project team. As an integrated part of risk identification, risks affecting a construction project. Risks analysis is an intermediate process between risk identification and risk response. Proper evaluation and analysis of risks help to decide justification of costly measures to reduce the level of risk (Ehsan et al .2010). Zou et al .(2007).viewed that once the risks of a project have been identified and analyzed, appropriate risk response strategies must be adopted to cope with the risks in a project implementation. It is worth to mention that the treatment measures on each risk are based on the nature and impact of the risk .Gopal (2005) identified four response measures to risk which include: ignore the risk, avoid the risk, transfer the risk, and accept the risk, the later response measure accept the risk means to recognize acknowledge, and understand that the risk item is the responsibility of the project team and must be managed. A comprehensive risk management processes tend to be most useful where dealing with projects involving substantial resources, significant novelty, long planning horizons, large size, task complexity, multiple organizations, and significant political issues (Chapman and word, 2002). The risk of variation and overrun are far from being under control; hence the need to identify and assess the risk factors affecting cost performance of public construction projects and its impact.

Risk factors affecting cost performance of construction projects.

Risk factors affecting construction cost are large in number and the research investigation of these factors is on going across the world. The success of construction project is highly dependent on an in depth investigation of the various sources of risk factors and assessment of their effect in order to improve project performance. Risk has been investigated as the risk factors affecting cost performance of construction project (Lyer and Jha, 2005 and Lehoai et al .2008); some studied the reasons for the inaccurate estimate or derivation from estimated cost; and others as factors influencing construction cost overruns (Kaming et al. 1997; Enshassi et al . 2009; Olawale and Sun, 2010). Ghosh and Jintanapakanont (2004), identified 59 risk factors in construction projects. Chen et al.(2004) identified 15 risks affecting

construction cost and classified the factors. Into 3 groups, namely; resource factors, management factors, and parent factors. Rahman and Kumaraswamy (2002) identified 41 risks in construction projects while Zou et al. (2007) identified twenty major risks in factors affecting project objectives. Odusanmi and Onokwube (2008) can identified seven major factors affecting the accuracy of pre – tender to include expertise of consultants, quality of information and flow requirements, project team's experience of construction type tender period and market conditions, extent of completion of pre – contract design, complexity of design and construction, availability of supplies of labour and materials. Mathews (2003) in a surveyed research identified sources of construction project risks which are inaccurate project, financial records and reports, excessive requirements and scope management issues, overcharges and costly practices, excessive charge orders, project funding to aligned with project plans, government compliance issues, insufficient staffing and processes to deliver projects, project communication breakdown, claims and disputes. Windapo and Iyabo (2007) identified factors affecting housing construction costs in Nigeria to include material costs, cost of capital or finance, cost of acquiring land, foreign exchange rates, cost of infrastructure, labour cost, money supply and national disposable income. Reason for finishing building construction projects over budget according to Jackson (2002) include design change, design development, information availability design brief, estimating methods, design team performance, project management, time limits, site conditions, organization claims, commercial pressures people, procurement route and external factors. Elchaig et al. (2005) identified the significant qualitative factors affecting project costs to include client priority on construction time, contractor's planning capacity, procurement methods, market conditions and the level of construction activity. This study examine mainly the negative risks inherent in construction project which impact cost performance of public construction projects.

RESEARCH METHODOLOGY.

The methodology of the study was conducted through literature review as well as expert opinions were taken from selected cross – section of construction practitioners and client of considerable experience in the construction industry. As a result of the interviews, the component and

constituent elements of the survey were finalized. A structured questionnaire consisting of two part was designed into A and B. part. A consisting of requesting respondents personal information (e. g academic qualification of respondent, professional affiliation of respondent, membership of professional bodies, cadre of professional membership, years of experience in construction business .for the demographic information of the respondents. Part B addressed the objectives of the study using mean item score. A total number of 180 questionnaire were distributed, 30 out of the total survey show no response, total number of potential responses, was 150 and total valid responses received was 120. The response rate (67%) an indication that the survey was found to be considerably good for assessment of risk factors affecting cost performance of public construction projects within the study area.

ANALYSIS AND DISCUSSION.

Frequency distribution.

Besides indicating the distribution feature of responses provided by questionnaire respondents, tools of frequency distribution was used to classify observation (Salvatore and Regeale, 2002). This tools include frequency distribution tables for qualitative and quantitative parameters in the study questionnaire as well as percentile to obtain percentiles, the relative frequency of observations were computed and thereafter converted to percentages for the background information of the respondents in Table 1.

MEAN ITEM SCORE.

The study adopted a variant of arithmetic mean known as the mean item score to obtain a quantitative equivalent of the average response provided by respondents in accordance with a 5 – point likert – type scale. This measure was adopted in gathering the majority opinion of respondent with respect to:

1. To identify the risk factors affecting cost performance of public construction projects in kogi state contractors and consultants perspective.
2. To assess those major risk factors affecting cost performance of public construction projects in kogi state contractors and consultants perspective.

Using a 5 point likert – scale where 5 is the highest score, and 1 being the lowest score should be computed using equation below.

$$\text{Mean} = \frac{\sum fw}{\sum f}$$

Where \sum_{FW} connote the sum of the product of all weights, while \sum_F is the total number of respondents.

$$\text{Mean} = \frac{(5 \times f_5) + (4 \times f_4) + (3 \times f_3) + (2 \times f_2) + (1 \times f_1)}{f_5 + f_4 + f_3 + f_2 + f_1}$$

Criteria for drawing inference from the mean score were established as follows:

4.90 < MIS ≤ 5.00	Very significant (or very high (impact), very easy, etc)
3.70 < MIS ≤ 4.89	Significant (or high (impact), easy, etc.)
2.50 < MIS ≤ 3.69	Neutral (or medium (impact), neutral, difficult, etc.)
1.30 < MIS ≤ 2.49	Insignificant (or low (impact), difficult, etc.)
0.00 < MIS ≤ 1.29	Very insignificant (or very low (impact), very difficult, etc)

The mean item score was used to achieve the first and second objectives of this study respectively.

Table 1: Background information about respondents

Category	Classification	Frequency	Percentage.
Academic Qualification of respondents	MSc / M Tech / M Eng	10	8.33
	PGD	30	25.
	BSc / B Tech / B Eng	45	37.5
	HND	35	29 .17.
	Total	120	100.00
Professional affiliation of respondents	Architect	25	20.83.
	Builder	30	25.
	Engineer	25	20.83.
	Quantity Surveyor	40	33.33.
	Total	120	100. 00.

Membership of professional bodies.	NIA	30	25.
	NIOB	25	20.83.
	NIQS	35	29.17.
	NSE	30	25
	Total	120	100.00.
Cadre of professional membership	member	45	37.50.
	Associate	25	20.83.
	Graduate/probationer	50	41.67.
	Total	120	100.00.
Type of organization firm.	Contracting	50	41.67.
	Consulting	40	33.33.
	Client	30	25.00.
	Total	120	100.00.
Years of experience in construction	1 -10	45	37.5.
	11 - 20	30	25.00
	21 - 30	25	20.83.
	31 - 40	20	16.67
	Total	120	100.00
Mean 17.17..			

Source: Field Survey (2020).

Table 1: Above show the summary of the background information of respondents. Its observed from the table that 25.00% of the respondents possess post graduate qualifications while about 37.5% have bachelor of science and 29.17% possess higher national diploma in their various fields of study. Furthermore about 37.50% of the respondents are members of their respective professional bodies, 20.83% and 41.67% of them are also associate and graduate/probationer members of their professional bodies respectively. Moreover the respondents have an average mean of about 17. 17 years of experience in the construction industry. based on the above analysis, therefore, it can be concluded that the data provided by the respondents can be relied upon for the purpose of analysis.

Table 2: Contractors and Consultants Perceptions on effect of risk factors on cost performance of construction projects in kogi state.

Factors.	Overall Mean. Score.	Rank.	Mean Score of Contractors.	Rank.	Mean Score of Consultants	Rank.
Change of scope Or design.	4.77	1 st	4.70	2 nd	4.85	1 st
Poor financial control On site.	4.73	2 nd	4.77	1 st	4.68	5 th
Delay in progress payment.	4.68	3 rd	4.66	3 rd	4.70	3 rd
Fluctuation in prices of Materials.	4.60	5 th	4.44	5 th	4.71	2 nd
Lack of provision for Advance payment	4.43	6 th	4.39	7 th	4.47	6 th
Mistakes during construction.	4.27	9 th	4.21	8 th	4.33	9 th
Shortage of site workers.	4.43	6 th	4.40	6 th	4.46	7 th
Adverse or inclement weather Condition.	4.30	8 th	4.20	9 th	4.40	8 th
Inadequate planning & scheduling.	4.24	10 th	4.17	11 th	4.30	10 th
Rework for correcting unsatisfactory work.	4.10	13 th	4.20	9 th	3.99	18 th
Lack of safety consciousness.	4.06	14 th	4.00	14 th	4.12	14 th
Client type.	3.98	17 th	3.88	18 th	4.07	15 th
Error and omissions in contract Document.	3.99	15 th	3.98	16 th	4.0	17 th
Inefficient use of construction Equipment.	3.99	15 th	3.97	17 th	4.02	16 th
Late procurement	3.95	16 th	4.00	14 th	3.89	20 th
High cost of machinery.	3.86	18 th	3.78	20 th	3.94	19 th

Lack of incentive or motivation.	3.64	22 th	3.08	35 th	4.20.	13 th
Delay payment to suppliers And subcontractors.	3.73	19 th	3.78	20 th	3.67.	23 th
Longtime between tendering and Construction.	3.64	22 th	3.78	20 th	3.50	29 th
Defective quality materials.	3.67	20 th	3.77	22 th	3.57	27 th
Project location.	3.64	22 th	3.66	24 th	3.61	26 th
Limited capacity to produced Required construction materials.	3.58	25 th	3.50	25 th	3.66	24 th
Poor communication between the Supervisors and labour.	3.60	24 th	3.41	29 th	3.78	22 th
Mode of financing bonds and Payments.	3.54	26 th	3.43	27 th	3.65	25 th
Lack of productivity standard.	3.49	27 th	3.50	25 th	3.48	30 th
Contractual claims.	3.36	28 th	3.43	27 th	3.29	32 th
Interest rate charged by financial Institution.	3.16	31 th	3.34	30 th	2.98	37 th
Size of the project.	3.12	32 th	3.17	33 th	3.08	34 th
Complex design and technology.	3.24	29 th	3.18	32 th	3.30	31 th
Unavailability of construction Materials locally.	3.07	33 th	3.10	34 th	3.04	35 th
Poor road network. Delay preparation and approval Of drawings.	3.01	34 th	2.98	37 th	3.04	35 th
Incompetent subcontractors.	2.94	36 th	2.88	39 th	3.00	36 th
Lack of experience.	2.91	37 th	2.89	38 th	2.93	38 th
Project duration.	2.83	39 th	2.76	40 th	2.89	39 th
High transportation cost.	1.95	41 th	1.89	42 th	2.00	43 th
Accessibility to site.	1.68	44 th	1.68	45 th	1.68	45 th
High cost of fuel.	1.50	45 th	1.54	46 th	1.45	46 th
Delays in delivery of materials.	1.92	42 th	1.84	43 th	2.00	43 th
Unstable inflationary trend.	2.96	35 th	3.03	36 th	2.88	40 th
Equipment breakdown/failure.	4.17	11 th	4.13	12 th	4.21	12 th
Lack of competition among the Suppliers or manufacturers.	4.17	11 th	4.03	13 th	4.30	10 th

Foreign exchange rates.	3.84	19 th	3.79	19 th	3.88	21 th
Schedule delay.	3.67	20 th	3.77	22 th	3.56	28 th
High cost of labour.	4.68	3 rd	4.66	3 rd	4.70	3 rd
Accident on site.	3.17	30 th	3.23	31 th	3.11	33 th
Inadequate briefing.	2.49	38 th	2.42	41 th	2.56	42 th
Change in materials specification						
And type.	1.82	43 th	1.69	44 th	1.95	44 th
Unskilled equipment operators	2.80	40 th	2.80	39 th	2.79	41 th

Source: Field Survey (2020).

The result of the analysis shown in table 2 above revealed that based on the contractors perception ,cost performance on poor financial control on site was ranked highest with the mean item score of 4.77 followed by change of scope or design was ranked 4.70 respectively. Delay in progress payment by client for completed work followed by high cost of labour having the same mean item score of 4.68 respectively. More so, fluctuation in prices of materials, shortage of site workers, lack of provision for advance payment, ranked 5th ,6th and 7th with mean item score of 4.44, 4.40 and 4.39 respectively. Furthermore, mistakes during construction, adverse or inclement weather condition ranked 8th and 9th with mean item score of 4.21 and 4.20 respectively. High cost of fuel and accessibility to site were the factors ranked least by contractors with mean item score of 1.54 and 1.68 respectively. This indicates that these factors do not have significant effect on cost performance of construction projects. other factors ranked by the contractors based on their perceptions shows that cost performance have significant impact on assessment of risk factors as indicated in table 2 above . the result informed that when the financial need of the project is not aligned with the project, it can lead to stoppage which has both cost and time implication on the project and the level of details of project scope or design as major factors affecting cost performance which may eventually result to overall project cost overrun. .On the other hand, consultants perception of the effect of risk factors on cost performance of construction projects. the result of the analysis revealed that change of score or design was ranked the highest factors affecting cost performance with mean score of 4.85 followed by fluctuation in prices of materials, with mean score of 4.71 respectively. Delay in progress payment, high cost of labour, ranked the same with mean score of

4.70 respectively. Poor financial control on site, lack of provision for advance payment and shortage of site workers were ranked 5th, 6th and 7th with mean score of 4.68, 4.47 and 4.46 respectively. Advance or inclement weather condition, mistakes during construction and inadequate planning and scheduling were ranked the 8th, 9th and 10th with mean score of 4.40, 4.33 and 4.30 respectively. Additionally, the factors ranked least among the factors affecting cost performance of construction projects. in this study is high cost of fuel and accessibility to site with mean score of 1.45 and 1.68 respectively. The result indicated that the consultants perceived deficiency in management on the part of the building team to be able to manage the client's needs and the score resources committed in the projects in order to give value for money especially now that the clients are demanding for accountability of their projects.

CONCLUSION AND RECOMMENDATIONS.

The achievement of cost performance is mainly the responsibility of consultants and contractors in the building industry. This study investigated the important factors affecting achievement of cost performance of construction projects in the state from the view of contractors and consultants. The study established that the risk factors affecting the realization of cost performance of construction projects are inherent within and outside the components of project activities some of these risks can be categorized as construction activity resources based factors, financial and environmental factors. The study revealed that there is strong agreement between the contractors and consultants on their perceptions of the risk factors affecting cost performance of projects. The study concludes that the majors factor affecting cost performance of projects include, change of scope or design, poor financial control on site, high cost of labour, cash flow and financial difficulties faced by contractors, delay in progress payment by client for completed work, fluctuation in prices of materials, lack of provision for advance payment, mistakes during construction, shortage of site workers, unstable inflationary trend, and adverse or inclement weather. These factors are very critical to the achievement of cost budget and the overall project costs. The study therefore, recommends that contractors and consultants should focus on risks identified in this study that are related to finance, contractor's site management project design both human and non – human

resources as good management of these risks could reduce their negative effects and enhance the possibility of achieving cost budget and overall project cost performance.

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