Faculty of Environmental Design

AHMADU BELLO UNIVERSITY, ZARIA

Proceedings of

EDCON 2021

Theme :

The Environment:

SUSTAINABLE DEVELOPMENT

& EMERGING POSSIBILITIES

1st Environmental Design Conference, AGM & Homecoming Reunion

Date: Monday 28th June - Friday 2nd July, 2021

RISK MANAGEMENT OF ROAD CONSTRUCTION PROJECTS IN NIGERIA: THE PROCESS PROTOCOL APPROACH

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ABSTRACT

This paper identifies risk associated with the various stages of the road construction project according to the process protocol approach in Nigeria. The rationale for this study stems from the fact that risk is present at every stage of the road construction project and the unproductiveness of road construction process using the traditional method of risk management resulting in under delivery of projects goals and objectives. Process Protocol provides a structure for managing risk in construction projects and has redefined that the traditionally fragmented construction industry can be improved by adopting a "process view". The study employed a qualitative methodology approach and data were collected through the questionnaire survey administered to professionals working in civil engineering organisations in Abuja in order to identify risk at the pre- project and pre-construction stages of projects. A sample size of 60 was used and 46 were returned which gives a response rate of 76%. Data collected were subjected to descriptive analysis; critical risks associated with road projects were identified and ranked. Payment delays and cash flow problems, bureaucracy of government, bribery and corruption, corruption and unethical practices and improper project management ranked high in the pre- project and pre-construction stages. The study concludes that focusing on the critical risk will improve productivity and efficiency in the construction process and that risk identification be carried out independently for each stage of the project since construction is a process.

Keywords: Risk Management; Process protocol; Risk Identification; Road projects

INTRODUCTION

Road construction projects depending on location and geography are exposed to risk from inception and at various stages due to the complex nature of the construction process which also accounts for the poor performance in road projects (Vishwakarma, Thakur, Singh, & Salunke, 2016). In a study by Parera, Rameezdeen, Chileshe, & Hosseini (2014) it was established that some major risk in road projects could occur in more than one phase of the project life cycle, the study also emphasized the necessity of handling these risk factors as a prerequisite for project success. Despite the dearth of studies and research, several road projects get stalled during their execution phases due to the risk associated with such projects and suffer from significant under management of risk throughout its lifecycle as the management of risk is also not properly accounted for, which has negative effect on project delivery (Beckers, et al. 2013; Beckers & Stegemann, 2013, Serpella, Ferrada, Rubio, & Arauzo, 2015, El-Sayegh & Mansour, 2015). Notably, Risk management in road construction project is an essential consideration for the completion of project and its assessment is also important (Kumar, 2017).

For many years, risk management has not been handled adequately which has limited the quality of project performance, especially in developing countries the major challenge of managing risks on large construction projects are the need to foster integration within terms, to understand and manage the project scope and be realistic about cost schedules at projects inception. The risk management practice in developing countries has been insufficient, thereby producing poor result that has limited the success of projects (Serpella, Ferrada, Rubio, & Arauzo, 2015; Gajewska & Ropel, 2011).

Furthermore, road and other construction projects are unique and often not incorporated with new techniques and procedures (Abd Karim, Ismail Abd, & Jamil, 2012; El - Karim, El - Nawawy, & Abdel - Alim, 2015; Sarkar and Kovid, 2015). And the core element of project success is to meet the time, cost and quality targeted (Tilipi & Yakubu, 2016).

Regrettably, the construction projects despite being unique and the involvement of many skills that are non- repetitive in nature is associated with high risk and has been slow in applying management principles that have proven effective in other industries (Gupta, Sharma, & Trivedi, 2015). Traditionally, it deals with the product and risk issues at the pre-contract stage of projects but most of these risks are not adequately dealt with owing to the fragmented nature of the construction process which involves players that are disconnected from each other, task and work in isolation, the complexity of projects, location significantly contribute to risk in construction projects which has yielded and low inefficiency productivity; however, it can embark on the same journey as the manufacturing industry in improving coordination between the different parties and adopting the "process view" (Kagiouglou, Aouad, & Sexton, 2000; Tilipi & Yakubu, 2016; Serpella, Ferrada, Rubio & Arauzo, 2015). The process view asserts that though, construction projects are complex and unique, despite their uniqueness they have more in common that distinguishes between them and are also different in character therefore the process should be addressed not the product as traditionally done (Cooper, Aouad, Lee, Wu, & Kagiouglou, 2005; Burger, 2015; Aziz and Abdel-Hakam, 2016).

However, the Process Protocol provides a structure for managing risk in construction projects and has redefined that the traditionally fragmented construction industry can be seen to embark on the same journey as the manufacturing industry in improving co-ordination between the

different parties and phases by adopting a "process view" which has proven to have a number of advantages. Process can balance the key of project challenges and provide a tool for making decisions throughout the project. The Process Protocol essentially breaks down the design and construction process into 10 distinct phases. These 10 phases are grouped into 4 broad stages namely Pre-Project, Pre-Construction, Construction and Post-Construction. In construction, processes importantly should be continuously changed and improved, these processes are accompanied by risk which in turn affects projects adversely and may increase the initial cost, time and quality of projects. Quality management of risk should make changes possible in the construction industry to improve efficiency (Kagiouglou, Aouad, & Sexton, 2000; Ceric, 2003; Cooper, Aouad, Lee, Wu, & Kagiouglou, 2005; Scheig, 2006). Worth noting is the inadequate identification of risks at different stages of the construction process that has resulted in the cost and time overruns which affects project delivery negatively (Ojo & Odediran, 2015).

The study identified the critical risks associated with Nigerian road project at the pre-project and pre- construction stages according to the process protocol thinking, with a view to improving the construction process. The research is part of an ongoing research and is limited to the identification of critical risks according to the process protocol thinking at the two stages (pre- project and pre- construction stages)

LITERATURE REVIEW

Risk Identification

Abd Karim, Ismail Abd, & Jamil (2012) posit that in managing risk for construction projects, identification of risks factors is very important. Perera et al., (2014) emphasised that the requirement for any risk management studies must consist of risk identification, risk analysis and risk response, which will culminate effective results.

Risks and other threats can be hard to eliminate, but when they have been identified, it is easier to take actions and have control over them (Nnadi & Ugwu, 2013) . Tilipi & Yakubu (2016) opined that risk identification is a process of uncovering any risk that could potentially affect a process and there are no absolute procedures that may be used to identify risk in a project. Renault & Agumba (2016) observed that if risk attached to a project is not firstly identified it will be almost impossible to respond to it thereby affecting the entire project; risk identification involves the identification of all possible risks and circumstances that may affect the project, as well as the conditions giving rise to these risks. Risk identification is the discovering, recognising and outlying the risk that has effect on achievement of organisational objectives and when the source of risk is identified it is easier to investigate the consequences of that source (Aminu, 2013). On the other hand, Parera et al., (2014) ascertained that the risk identification stage relies on the context from which the experts come and the commonplace risks based on their experiences in that very context which invarably it is regarded as the most important step of the risk management procedure.

Process Protocol Approach

Process Protocol is seen as "a common set of definitions, documentation and procedures that will provide the basics to allow a wide range of organisations involved in a construction project to work together seamlessly", and aims "to map the entire project process from the client's recognition of a need to operations and maintenance" (Kagioglou et al, 1998). The process protocol considers the whole life cycle of the construction project whilst integrating its

participants under a common framework. The process protocol identifies the various phases of a construction project with particular emphasis on what is described in the manufacturing industry as the "fuzzy front end" (Kagiaglou, Cooper, Aouad, & Sexton, 2000).

The protocol takes the form of a framework detailing the generic design and construction processes within a construction project. The idea was for construction firms to take the map and to use it as a framework to help them to improve their business through industry interest and acceptance (Wu, Flemming, Aouad, & Cooper, 2002).

Risks in Road Construction Projects

"Risk is the major cause of poor performance in highway projects" (Vishwakarma, Thakur, Singh, & Salunkhe, 2016). Parera et al., (2014) also noted that road projects have substantial risk in each of its stage. Parera et al., (2009) identified technical and contractual risk, economic, finanacial and political risks, managerial risk, external and site condition risk to be risks associated with road projects in Sri Lanka. Waghmare & Pimplikar (2012) opined that for the feasibilty phase of road projects, marketing aspect, technical and technology aspect, political aspect, regulation and policy aspect, social and cultural aspect, environmental and spatial plan aspect, financial aspect are the risk factors in roads projects. Vishambar et al., (2016) divided the risk in roads into two main risk types major and minor and further categorised the major risk to comprise of traffic risk, toll risk, construction risk, operational and maintenance risk, land acquisition and the minor risk comprise of utilities, noise, material and manual handling. Sharaf & Abdelwahab (2015) opined that the most significant risk in highway construction projects in Egypt are those that occur frequently during project life cycle and have high impact on project accomplishment. Amongst all of these, risks in road and high way construction projects impacts majorly on issues to time, cost and quality of project delivery (Chileshe & Babajide, 2010).

RESEARCH METHOD

Data was collected through the survey questionnaire administered to professionals involved in road construction projects in Abuja. Abuja was chosen because of the frequent road construction projects carried out regularly. The population of the study comprised of contractors who have been involved and are still perceived to be involved in road construction projects.

The study employed the qualitative methodology which according to Buzz, (2019) covers a spectrum of highly useful methods which can add valuable insight to projects and businesses. The sample design used for this study is the purposive sampling technique and the case study strategy. It is a type of non- probability sampling design that is most effective when one needs to study a certain domain with knowledgeable experts within and allows the researcher to be more creative in dealing with sampling issues (Guetterman, 2015). The purposive sampling is beneficial as it helps a researcher identify particular types of cases for in- depth investigation so as not to generalize findings (Ishak & AbuBakar, 2014). The case study is one of the most frequently used qualitative research methodologies in educational research (Yazan, 2015). Creswell, (2015) also recommended a sample size of 30 and pointed out that 30 seems to be a good number for most comprehensive assessment, emphasising on the quality of data gathering not quantity in a qualitative study., hence a population size of 60, 30 sample size for each of the cases studied was used for the study. Two cases were studied in this reasearch.

Data Analysis Technique

The research used the descriptive data analysis technique comprising of tables, frequencies, weighted scores and ranking in analysing the quantitative data obtained from the questionnaire. Statistical package for social sciences (SPSS statistical 23) was used to input data. The analysis was done organisation by organisation. The risk categorisation of the identified risk was done in the main study through extensive literature review, a total of 5 risks categories and 25 identified risks were selected as detailed in table1. Only the results of the questionnaire analysis were used for this study, the interview results were not included.

RESULTS

Questionnaire Analysis of Case I and Case II

Demographic information

A total of 60 questionnaires (30 for each case) were distributed to professionals in cases I and II respectively across the two organisations out of which 22 were retrieved from case I and 24 from case II. Project risk management relies heavily on expert judgment and knowledge; for the risk management process to be appropriate there should be a procedure for extraction and aggregation of opinions from multiple experts (Jaskowski & Biruk, 2011). The analysis is therefore based on 22 and 24(total 46) returned questionnaires denoted as **N** in tables 3 – 6.

Results from the questionnaire analysis were done in two stages: section A contains demographic information(bio data) about the respondents and section B contains analysis of questionnaires on the identification of major risk common to road projects as they appear at the pre- project and pre- construction stages of road construction projects according to process protocol.

Analysis of Section B: - Identification of risks

Table 1:- Coding of the identified risk

Risk Factor	Identified Risk	Code
Financial / Market Risk	Price inflation in construction materials	R1
	Unavailability of critical resources in the local market	R2
	Payment delays / cash flow problems	R3
Management /Design Risk	Poor communication	R4
	Defective/ incomplete design	R5
	Improper project management	R6
	Short tendering time	R7
	Corruption and unethical/ practices	R8
	Unanticipated damage during construction	R9
	Accidents on site	R10
Legal Risk	Breach of contract by project partners	R11
	Improper verification of contract agreement	R12
	Lack of enforcement of legal judgment	R13
	Dispute	R14
	Change of government policies	R15
	Bureaucracy of government	R16

	Corruption/ Bribery	R17
	Religious and cultural conflicts	R18
Environmental Risk	Environmental conditions	R19
	Force majeure	R20
	Safety and security	R21
	Stiff environmental regulations	R22
Utilities / Logistics Risk	Damage to materials and equipments during transportation	R23
	Availability of suitable labour and materials	R24
	Access to spare parts for equipment	R25

Table 1 shows the coding of the various identified risks. To enable convenience of analysis. The codes given are R1 –R25 and shall be used consequently in this research. . The respondents were asked to identify risk factors on the road construction projects as they appear at the pre-project stage, bearing in mind that these risks can occur in more than one phase as detailed by literature. A total of 5 risk factors were categorised with 25 identified major risks from extensive literature review in the main study.

Section A: - Bio Data (Cases I & II)

Table 2 Demographic information of respondents

S/N	Item	Case I	Case II	Number
1.	Name of Organisation	nil	nil	
2.	Status: Project Manager	12	16	28
	Contract Manager	9	8	17
	Others	1	nil	1
	TOTAL:	**22**	**24**	**46**
3.	Discipline:- Mechanical Engineer	nil		2
	Electrical Engineer	nil		3
	Structural Engineer	5		4
	Civil Engineer	12		15
	Others	5		nil
4.	Work Experience:-> 5 years	nil		nil
	6- 10 years	nil		2
	11- 15 years	5		12
	< 15years	17		10
5.	Highest Qualification:-M.Sc / M. Tech.	nil		1
	B. Sc/ B. Tech	17		22
	HND.	5		1
	OND.	nil		nil

Table 2 illustrates the bio data of case I & case II showing the name of company which was optional and will not be discussed for confidentiality. A total of 46 questionnaires were

retrieved out of 60 issued collectively. The response rate was 76%. All the cases have the respondents at managerial levels indicating they were involved with running projects at both strategic and operational levels therefore had the knowledge of issues related to evaluating of risk events and project management in general.

The importance of ascertaining the experience and professional background of respondents is due to the varying perceptions of risks established. The information provided basis for the reliability of data given by the respondents. This explains that the attitudes and beliefs, experience of a person makes the basis of risk perception and individual judgements and risk management (Haseeb et al., 2014).

Section B : Identification of critical risks at the pre- project and pre_ construction stages of the road construction projects.

The strength or dominance of the risk factor is determined by the size of the mean in all the stages. The higher the score, the more dominant the risk is. It is difficult to manage all potential risks in a construction project, there is need to focus on the key risks, hence trying to identify all the risks is counterproductive and time consuming, the trick is to identify the most critical risk and control them (El- Sayegh 2008) Following the identification of risk is the ranking of the identified risk at each stage. Accordingly the risk ranking intent can provide sharper focus on the critical risk within the system (Kumar, Sheikh, & Asadi, 2017). The coventional risk ranking serves the purpose of risk analysis because it draws the attention of management towards critical aspects of the project, which if mitigated and managed intelligently will result in a higher probabaility of projects success (De Marco & Thaheem, 2014).

The paper focused on the most critically identified risks with very high weighted scores and ranking. Therefore the risk between 1st and 10th ranks were discussed. This is in accordance with a previous study that stated that this kind of result is appropriate because all risk were relevant in the determination of a realistic estimate of any project

Pre- project Stage: Case I

Table 3: Identification of critical risks common to road project at Pre- project stage

Risk Factor	Identified Risk	N	1	2	3	4	5	Weighed Score	Ranking
Financial / Market Risk	R1	22	5	5	6	3	3	60	12th
	R2	22	4	6	7	3	2	59	13th
	R3	22	1	2	2	10	6	81	1st
Management /Design Risk	R4	22	2	4	9	5	2	67	8th
	R5	22	3	9	4	3	3	60	12th
	R6	22	3	4	7	4	4	68	7th
	R7	22	4	4	5	3	6	69	6th
	R8	22	2	2	5	7	6	79	2nd
	R9	22	6	6	3	5	2	57	15th
	R10	22	3	3	8	5	3	68	7th

Legal Risk	R11	22	2	6	5	5	4	69	6th
	R12	22	5	7	5	3	2	56	16th
	R13	22	4	2	8	5	3	61	11th
	R14	22	4	6	4	4	4	62	10th
	R15	22	3	6	7	3	2	58	14th
	R16	22	3	6	8	2	3	52	17th
	R17	22	3	3	2	9	5	76	3rd
	R18	22	4	8	6	2	2	56	16th
Environmental Risk	R19	22	4	4	6	6	2	62	10th
	R20	22	3	4	5	4	6	64	9th
	R21	22	5	3	7	5	2	62	10th
	R22	22	2	6	4	2	8	74	4th
Utilities / Logistics Risk	R23	22	0	2	14	4	2	72	5th
	R24	22	4	4	7	4	3	64	9th
	R25	22	5	5	9	2	1	55	17th

Table 3 illustrates the identification of risk at the pre- project stage of the process protocol. From the table, ranking 1st is R3= (Payment delays / cash flows) with a weighted score of 81. 2nd in ranking is R8= (Corruption and unethical / practices) with a weighted score of 79. 3rd is R17 = (Corruption/ Bribery) with a weighted score of 76. 4th in ranking is R22= (Stiff environmental regulation) with rated score 74. 5th in ranking is R23= (Damage to materials and equipment during transportation) with a weighted score of 72. 6th in rank R7= (Short tendering time) with a weighted score of 69. 7th in ranking is R6= (Improper project management) with a weighted score of 68. 8th in rank is R4= (poor communication) with a weighted score of 67. 9th in ranking is R19 = (Environmental conditions) with a weighted score of 64. Ranking 10th is R14 = (Dispute) with a weighted score of 62. The highest in ranking being payment delays / cash flows which is in agreement with studies by Alvafin & Motamedi (2014), Akinsiku & Ajayi (2016) which means that delay in payment has negative effect on different aspects of a project which may cause decrease in quality and affect project delivery. This can be improved by including arbitration clause in the contract. Closely followed is corruption and unethical /practices which also agrees with the studies of Adeyemo & Amade (2016), Ayodele, Ogunbade, Ariyo, & Alabi (2011) that opined that corruption practices are evident in all stages of a construction project which can be caused by greed, poverty god fatherism amongst others. In order to curb corruption and other related issues drastic measures and severe punishment for offenders. Transperancy in the procurement process should also be encouraged and close monitoring by respective professional.

Pre- project stage: Case II

Table 4: Identification of critical risks common to road project at Pre- project stage

Risk Factor	Identified Risk	N	1	2	3	4	5	Weighed Score	Ranking
Financial / Market Risk	R1	24	2	3	14	2	3	73	8th
	R2	24	2	4	15	2	1	68	11th
	R3	24	1	2	4	11	6	91	1st
Management /Design Risk	R4	24	4	3	11	4	2	69	9th
	R5	24	5	7	5	3	4	66	10th
	R6	24	1	2	5	11	5	89	2nd
	R7	24	2	5	6	7	4	78	4th
	R8	24	1	2	2	13	6	83	3rd
	R9	24	5	8	6	3	2	61	13th
	R10	24	6	9	5	2	2	57	15th
Legal Risk	R11	24	5	5	10	2	2	62	12th
	R12	24	3	9	9	2	1	47	21th
	R13	24	7	4	4	5	3	62	12th
	R14	24	4	4	11	3	2	62	12th
	R15	24	5	9	6	2	2	59	14th
	R16	24	6	7	4	5	2	62	12th
	R17	24	2	3	7	6	6	83	3rd
	R18	24	6	6	8	2	2	50	20th
Environmental Risk	R19	24	5	3	9	4	3	69	9th
	R20	24	4	5	7	6	2	75	6th
	R21	24	2	3	12	5	2	74	7th
	R22	24	3	4	7	5	5	77	5th
Utilities / Logistics Risk	R23	24	7	9	3	3	2	56	17th
	R24	24	7	7	7	2	1	55	18th
	R25	24	8	6	8	1	1	53	19th

Table 3 illustrates the identification of risk at the pre- project stage of the process protocol. From the table, ranking 1st is R3= (Payment delays/ cash flows) with a weighted score of 91. 2nd in ranking is R6= (Improper project management) with a weighted score of 89. 3rd in ranking are R8 & R17= (Corruption and unethical/ practices) & (Corruption/ Bribery) with weighted scores of 83 respectively. 4th in ranking is R7= (Short tendering time) with weighted score of 78. 5th in ranking is R22 = (Damage to materials and equipment during transportation) with a weighted score of 72. 6th in rank R20 = (Force majeure) with a weighted score of 75. 7th in ranking is R21= (Safety and security) with a weighted score of 74. 8th in rank is R1= (price

inflation in construction materials) with a weighted score of 73. 9th in ranking is R4 & R19 = (Poor communication) & (Environmental conditions) with weighted scores of 69 respectively. Ranking 10th is R5 = (Defective / incomplete design) with a weighted score of 66.

Pre-Construction Stage: Case I

Table 5 Identification of critical risks common to road project at Pre- construction stage

Risk Factor	Identified Risk	N	1	2	3	4	5	Weighed Score	Ranking
Financial / Market Risk	R1	22	4	5	5	5	3	64	6th
	R2	22	3	7	5	4	3	63	7th
	R3	22	4	2	8	4	4	68	2nd
Management /Design Risk	R4	22	7	5	5	3	2	54	13th
	R5	22	6	6	8	2	0	50	15th
	R6	22	5	6	7	2	2	56	11th
Legal Risk	R7	22	5	8	6	3	0	51	14th
	R8	22	3	3	5	5	6	74	1st
	R9	22	5	7	8	2	0	51	13th
	R10	22	4	6	10	1	1	55	12th
	R11	22	5	6	5	4	2	58	9th
	R12	22	4	4	8	3	3	63	7th
	R13	22	7	4	4	4	3	58	9th
	R14	22	6	6	5	3	2	55	12th
	R15	22	3	8	7	3	1	57	10th
	R16	22	4	5	6	4	3	63	7th
	R17	22	3	4	6	5	4	65	5th
	R18	22	6	6	6	2	2	54	13th
Environmental Risk	R19	22	5	3	5	5	4	66	4th
	R20	22	6	4	7	4	1	56	11th
	R21	22	4	4	8	4	2	62	8th
	R22	22	3	4	7	5	3	67	3rd
Utilities / Logistics Risk	R23	22	7	6	4	4	1	52	13th
	R24	22	4	8	7	3	0	53	14th
	R25	22	5	7	4	4	2	57	10th

Table 5 illustrates the identification of risk at the pre- project stage of the process protocol. From the table, ranking 1st is R8= (Corruption and unethical / practices) with a weighted score of 74. 2nd in rank is R3= (Payment delays / cash flows problems) with a weighted score of 68. 3rd in ranking is R22= (Stiff environmental regulation) with weighted score 67. 4th in ranking

is R19 = (Environmental conditions) with weighted score 66. 5th in ranking is R17 = (Corruption/ Bribery) with a weighted score of 65. 6th in ranking is R1= (Price inflation in construction materials) with a weighted score of 64. 7th in rank are R2, R12 & R16 = (Unavailability of critical resources in the local market, Improper verification of contract agreement & Bureaucracy of government) with a weighted score of 63 respectively. 8th in ranking is R21= (Safety and security) with a weighted score of 62. 9th in rank are R11 & R13= (Breach of contract by project partners, Lack of enforcement of legal judgment) with weighted scores of 58 respectively. 10th in ranking is R4= (poor communication) with a weighted score of 67. 9th in ranking is R19 = (Environmental conditions) with a weighted score of 64. Ranking 10th are R15 & R25= (Change of government policies, Access to spare parts for equipments) with weighted scores of 57 respectively.

Pre-Construction Stage : Case II

Table 6 : Identification of critical risks common to road project at Pre- construction stage

Risk Factor	Identified Risk	N	1	2	3	4	5	Weighed Score	Ranking
Financial / Market Risk	R1	24	6	4	4	5	3	61	10th
	R2	24	5	6	4	4	3	64	7th
	R3	24	2	6	6	5	5	77	2nd
Management /Design Risk	R4	24	5	7	7	3	2	62	9th
	R5	24	12	5	5	1	1	46	19th
	R6	24	7	6	7	2	2	58	12th
Legal Risk	R7	24	4	8	10	1	1	59	11th
	R8	24	1	5	6	7	5	82	1st
	R9	24	9	7	6	1	1	50	17th
	R10	24	7	5	10	1	1	56	14th
	R11	24	4	9	5	4	2	63	8th
	R12	24	4	6	8	3	3	67	6th
	R13	24	6	9	6	3	0	54	16th
	R14	24	4	9	9	1	1	58	12th
	R15	24	6	6	8	3	1	59	11th
	R16	24	3	5	7	4	5	75	3rd
	R17	24	5	5	5	5	4	70	4th
	R18	24	8	6	6	2	2	56	14th
Environmental Risk	R19	24	7	5	7	2	3	61	10th
	R20	24	7	7	5	4	1	57	13th
	R21	24	3	7	7	5	2	68	5th
	R22	24	5	6	5	4	4	68	5th
	R23	24	10	7	5	2	0	47	18th

Utilities / Logistics Risk	R24	24	7	7	10	0	0	51	16th
	R25	24	8	7	5	2	2	55	15th

Table 7: illustrates the identification of risk at the pre- project stage of the process protocol. From the table, ranking 1st is R8= (Corruption and unethical / practices) with a weighted score of 82. 2nd in rank is R3= (Payment delays / cash flows problems) with a weighted score of 77. 3rd in ranking is R16= (Bureaucracy of government) with weighted score 75. 4th in ranking is R17 = (Corruption and bribery) with weighted score 70. 5th in ranking are R21 &R22 = (Safety and security, Stiff environmental conditions) with a weighted scores of 68 respectively. 6th in ranking is R12= (Improper verification of contract agreement) with a weighted score of 67. 7th in rank is R2 = (Unavailability of critical resources in the local market) with a weighted score of 64. 8th in ranking is R11= (Breach of contract by project partners) with a weighted score of 63. 9th in rank is R4= (poor communication) with a weighted score of 67. Ranking 10th are R1 & R19 = (Price inflation in construction materials & Environmental conditions) with weighted scores of 61 respectively.

CONCLUSION

Risk is inherent in the Nigerian construction projects and identification of risk is critical for any projects success. The process protocol gives room for managing risk within project life circle. The research identified critical risk associated with the pre- project and pre- construction stages of the process protocol and has clearly shown that the most critical risks are: payment delays and cash flow problems, improper project management, bureaucracy of government, bribery and corruption and corruption and unethical practices the pre- project and pre-construction stages.

In agreement, studies by Alvafin & Motamedi (2014), Akinsiku & Ajayi (2016) posit that delay in payment has negative effect on early stage of a project which may cause decrease in quality, project forestallment and affect project delivery. This can be improved by including arbitration clause in the contract. Closely followed is corruption and unethical /practices which also agrees with the studies of Adeyemo & Amade (2016), Ayodele, Ogunbade, Ariyo, Alabi (2011) and they opined that corruption practices are evident in all stages of a construction project which can be caused by greed, poverty god fatherism amongst others. In order to curb corruption and other related issues drastic measures and severe punishment for offenders. Transperancy in the procurement process should also be encouraged and close monitoring by respective professional. Stiff environmental regulations in this study as identified is in line with Enhassi, Kochendoerfer, & Rizq (2014) & Ijigah et al., (2013) that suggest enacting laws to enforce institutions to make environmental impact assessment compulsory at the early stage of projects, since the construction sector is considered as one of the main sources of environmental pollution in the world and has direct or indirect effects on the environment, identifying the impact of construction projects on the environment is a task that needs to be accomplished early to realise effective environment.

Proper risk identification helps the professionals to decide and take adequate measures in order to achieve project goals therefore focusing on the critical risk will improve productivity and efficiency in the construction process. Risk identification should be carried out independently for each stage since construction is a process, and a cyclical risk management approach should

also be adhered to. The process protocol has broken the construction process into 4 distinct stages and 9 phases; the pre- project stage which is the first stage was the focus of this research because the level of influence is more at the early stages of construction which can help in the early decisions.

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