Appraisal of Risk Management Approaches in Construction Businesses: Implications for Multidisciplinary Construction Teams in Enugu State

by

Japel OnyekachiAsogwa[1], Jerry Ikechukwu Ogbonna[2], Victor ArinzechukwuOkanya[3]& Sussan Ngozi Oluka[4]

[1, 2, 3,] **DEPARTMENT OF INDUSTRIAL TECHNICAL EDUCATION UNIVERSITY OF NIGERIA, NSUKKA**

[4] **ENUGU STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY, ENUGU**

Correspondence: jerry.ogbonna@unn.edu.ng

Abstract

Risk management is a systematic means of recognizing, evaluating and handling danger in order to provide required information to decide on appropriate risk factor reduction strategies for effective job performance. This study appraised the risk management approaches in construction businesses, with a focus on multidisciplinary construction teams. A survey of90 construction business managers was conducted, with 78 construction professionals (28 engineers, 28 builders, 12 architects, and 10 quantity surveyors) responded, providing relevant data. The data collected were presented in tables and analyzed using descriptive frequency index (FI), severity index (SI), important index (Imp.I) and relative importance index (RII) models. The study identified material resources, design and drawing/planning, and labor as the major risk factors in construction businesses. The results also showed that the principal risk factor centers on risks that are likely to cause delay in construction projects. The study recommends risk management approaches, including green construction practices, regular site meetings, timely submission and facilitation of prompt approval from authorities, and proper project planning, specification, and scheduling. The findings of this study have implications for multidisciplinary construction teams, policymakers, and construction industry stakeholders.

Key words: construction business, risk, management, multidisciplinary construction team.

Introduction

Construction business refers to a multidisciplinary occupation which uses money, material, manpower and machine in rendering services for the development of any nation.It is a global activity with unique attributes that sets it apart from other economic activities (Butković, Kauric, &Mikulic, 2016). Activities in the construction business as compared to the production industry are usually carried out in the open environment and are therefore exposed to weather for a specific period of time. According to Orji, Solomon and Enebe(2016), construction industry has been described as a unique one with operations executed in open and confined spaces, involving many untrained labourers. Therefore, construction business is believed to be the most accident and fatality occurrenceprone occupation due to the relative environment, personnel, materials, machines and equipment. Globally, construction workers are three times more likely to be killed and twice more likely to be injured than workers in other occupations (Mba and Hilda 2014).Construction industry stands out among all other industries as the main contributor to severe and fatal accidents(Ahmed *et al*.,2000).Unfortunately, the lack of reliable data makes it impossible to know the actual rate of occurrence of accidents in Nigeria(Udo, Usip and Asuquo, 2016). However, in addition to all other factors, Aniekwu (2007) noted that both the construction and installation works is usually characterized with psychologically and physically vulnerable working environment.Therefore,multidisciplinary teams with management dexterities in the

diverse specializations in theconstruction business should rise to the challenges.

Management is a systematic and intentional process of planning, organizing, leading, and controlling resources to achieve specific goals and objectives (Koontz &Weihrich, 2024). It involves the effective use of human, material, and technological resources to optimize performance and achieve desired outcomes (Robbins & Judge, 2024). Management is a vital function in all organizations, as it enables them to operate efficiently, adapt to change, and achieve their strategic objectives (Hitt et al., 2024). Management is an administrative task usually carried out to achieve the set objective of the organization. Researchers has identified many areas or types of management as an administrative task to include; operational, strategic, financial, human resource, marketing, information, supply chain, project, and risk managements among others, (Jacobs and Chase, 2020; Hitt et al., 2024; Brigham andEhrhardt, 2020; Dessler, 2020; Kotler and Keller, 2020; Laudon and Laudon, 2020; Kerzner and Kerzner, 2020; Chopra and Meindl, 2020; Hillson and Murray-Webster, 2017).Therefore, these broad areas of the construction business require a collaborative effort of the multidisciplinary team in the management of the related risks.

A multidisciplinary construction team refers to a collaborative group of professionals from diverse backgrounds, contributing potential dexterities and working together to deliver a construction project.Working together enables team members share knowledge, expertise, and resources, leading to better decision-making, problem-solving, and better risk management (Cicmil et al., 2018; Chen et al., 2018). Multidisciplinary team typically consists of architects, engineers, contractors, project managers, and other specialists who bring their unique skills and perspectives to the project (Kumaraswamy et al., 2019). In the context of this study, multidisciplinary construction team in Enugu state comprises a collaborative assembly of professionals from varied disciplines, including; engineers, builders, architects, and quantity surveyors who pool distinctive roles to deliver construction projects in the state.

The key role of an Architect in the team is to design the building or structure, ensuring that it meets the client's requirements and complies with relevant regulations,(RIBA, 2020).The Engineer designs and develops the project's technical systems, such as mechanical, electrical, and plumbing (NSPE, 2020). The builder is responsible for the construction process, including site management, labor, and materials (AGC, 2020), while quantity surveyor prepares initial cost estimates and budgets for the project (Ashworth, 2017). Albeit, these roles are geared towards attainment of the construction project/ business objectives, and in line with Enugu state laws, practices involved in carrying out these roles are never left without risks.

Risk is the chance or probability that a person will be harmed or experience an adverse health effect if exposed to danger, while danger on the other hand refers to the situation or source (which could be biological, chemical, physical or ergonomic) of potential damage to somebody, property or equipment. It is believed that some industries are more hazardous than some others. The construction industry worldwide is considered as one of the most hazardous industry and all the multidisciplinary sects are inclusive. Construction industry in Enugu state has indeed faced myriad of risks, including contractual disputes, project delays, abandonment, and fatalities. A significant body of evidence suggests that these issues can be attributed to inadequate management of risk factors inherent in construction businesses. Therefore, effective risk management is crucial to mitigate these challenges and ensure successful

constructionproject delivery in Enugu state. This is necessary for the health and safety of the workers, clients and intended users of the construction end products in the state.

Risk management is a systematic means of recognizing dangers and evaluating them in order to provide required information to decide on appropriate reduction strategies. The primary goal of risk management is to ensure accurate risk identification, planning, evaluation, and reporting, enabling project managers to review key risks and control measures (Perrenoud et al., 2016). According to Hillson & Murray-Webster, (2017) risk management concerned with identifying, assessing, and mitigating risks that could impact an organization's operations or objectives (Hillson & Murray-Webster, 2017). It involves a planned approach to identifying, evaluating, and mitigating risks, as well as selecting and implementing options for risk handling It is an essential aspect of construction project management which can significantly impact project timelines, budgets, and quality (Zhang et al., 2019). Suffice it to stating that unmanaged or unmitigated risks can lead to project failure.Therefore, simplicity correspondence to project failure is effective risk managementstrategies. To this effect, effective risk managementiscrucial for construction teams in the multidisciplinary areas of the construction which include drawing and designing, electrical, mechanical, and building constructionpersonnel, to ensure project success. Hillson and Murray-Webster, (2017) asserted that effective risk management involves a planned approach to identifying, evaluating, and mitigating risks, as well as selecting and implementing options for risk handling.Effective risk management is crucial to successful project delivery necessary for the health and safety of the workers, clients and intended users of the construction end products in Enugu state.

LITERATURE REVIEW

Risk planning is a nonstop process of creating an organized detailed risk management approach. It includes procedures, practices, strategy development, setting of goals and objectives, planning assessment, control activities, resource identification, task and responsibilities etc. Planning describes how we intend to manage the risks and also describes the components of management, the approach and resources to be used in managing the risk. The plan can be applied to products, processes and projects or to entire organization (Perrenoud, *et al, 2016*).

Risk Identification (RI)

Risk identification is a crucial process that involves uncovering potential risks that could impact a project (Kerzner & Kerzner, 2020). This step is essential, as subsequent processes, such as risk analysis and response, rely on the accurate identification of potential risks (Olsson, 2018). Risk identification is a challenging task, as there is no one-size-fits-all approach to identifying risks in a project (Hillson & Murray-Webster, 2017). Managers often rely on their experience, expertise, and input from key personnel to identify potential risks (PMI, 2020). The risk identification process aims to identify the source and type of risks, as well as recognize potential risk event conditions in the construction project (ISO 31000, 2018). Effective risk identification involves clarifying risk responsibilities and ensuring that all stakeholders are aware of their roles and responsibilities in managing risk (ANSI/PMI 99-001-2017, 2017).

Risk Assessment (RA)

This stage in risk management involves analyzing risks throughout the system's life cycle, making informed decisions, and ensuring effective plan implementation (Kerzner & Kerzner, 2020). It is a critical stage where the potential consequences of identified risks are evaluated (Aven, 2020). To accurately assess risks, it is essential to understand their nature, sources,

and causes, as well as estimate their likelihood and potential consequences (Olsson, 2018). Risk assessment involves several key steps, including developing a probability-consequences scale, conducting supporting analyses, determining probability and significance levels, documenting results, and prioritizing risks (PMI, 2020). The risk analysis results are then compared to established risk criteria to determine whether a particular risk level is tolerable or not (ANSI/PMI 99-001-2017, 2017). The primary objective of risk assessment is to estimate risk by identifying potential undesired events, assessing their likelihood of occurrence, and evaluating their potential consequences (Hillson & Murray-Webster, 2017). Zhang et al., (2019) noted that to determine the likelihood of occurrence of risks is a significant challenge in risk assessment, especially when there is limited statistical data available on past incidents. Aprovides a comprehensive understanding of the risks facing an organization, and decision-making about risk mitigation and management.

Risk Mitigation (RM) in Construction Projects

Risk mitigation is a crucial aspect of construction project management, as it involves identifying, assessing, and reducing or eliminating risks that could impact the project. According to a study by Zhang et al. (2020), effective risk mitigation can reduce the likelihood of project delays, cost overruns, and other adverse outcomes. By employing risk mitigation strategies, construction companies can minimize the impact of risks and ensure successful project outcomes.

There are several risk mitigation strategies and techniques that can be employed in construction projects. These include risk avoidance, risk transfer, risk reduction, and risk acceptance. Liu et al. (2019) found that using Building Information Modelling (BIM) can help reduce risks associated with construction projects by improving communication and collaboration among stakeholders. Zhang et al. (2020), effective risk mitigation can also lead to improved project outcomes, including increased productivity and reduced waste (Zhang et al., 2020). By prioritizing risk mitigation, construction companies can ensure successful project outcomes and maintain a competitive edge in the industry.

Statement of the Problem

Studies and mere observations have revealed that the risk management capability of the multidisciplinary construction teams in Enugu state of Nigeria is at a relatively low level. Consequently, the prevalence of contractual dispute, delay and abandonment of many projects in the state are blamed on poor management of risk factors associated with the construction businesses. This poor management of the construction business risks is attributed to lack of knowledge and understanding of the risk identification and assessment procedures, and especially lack of implementation of formal risk management processes among the multidisciplinary construction groups. Thefocus of this study was to analyze the significant construction risk factors, ascertain their effects, in terms of frequency, severity, importance/relative importance indices among the multidisciplinary construction projects and establish approaches for curbing their occurrences.

Purpose of the Study

The purpose of the study is appraising risk management approaches in construction businesses with implications for multidisciplinary construction teams in Enugu state. Specifically, the study sought to:

1. identify the material resources associated risks in construction businesses
2. identify design / drawing and planning associated risks in construction businesses
3. labour associated risks in construction businesses

4. Compare the relative importance index of risk management approaches in curbing the associated risks in construction businesses.

Research Questions

The following research questions guided the study;

1. what are the material resources associated risks in construction businesses?
2. what is the design / drawing and planning associated risks in construction business?
3. what is the labour associated risks in construction businesses?
4. what isthe relative importance index of risk management approaches in curbing the associated risks in construction businesses?

METHODOLOGY

To achieve the objective of this study, survey method was adopted. Using extensive literature search, 5-point Likert scale questionnaires with 22 risk factors, grouped in 3 sections were evolved and issued to 102construction business managersdomiciled in Enugu state and registered with the Cooperative Affairs Commission (CAC). The sample was determined through a combination of purposive sampling and expert judgment. To ensure representation from the major specialization areas in the construction industry, the following sample frame was established based on relative proportion of each discipline in the state as well as the availability of potential respondents registered with the CAC.; 28 Engineers (civil, mechanical, and electrical,)28 Builders, 12 Architects, and 10 Quantity surveyors. The data collected were presented in tables and analyzed using descriptive frequency index (FI), severity index (SI), important index (Imp.I) and relative importance index (RII) models. Frequency index (F.I.) is the weighted product of number of respondents and their assigned Likert weights (1-5) for each risk factor expressed as percentage of the aggregate weighted product for all risk factors in that team. It has similar model for severity index (S.I.) using severity response Likert scale. We next evolved the importance index (Imp. I.) of each risk factor which is the product of its frequency index (F. I.) and severity index (S. I.). Finally, the relative importance index (RII) is evolved using the formula:

RII = 

AxN

Where: Σ =Summation

W = The Weighting 1-5 given by respondents to the risk factor

A = The highest weight

N= Total number of the respondents for each risk factor.

The major risks in the construction business having highest ranking indices in the 3 groups were selected and the most suitable approaches for curbing them were proffered for the businesses.

Table1

LIKERT'S SCALE FOR PERCEIVED CONSTRUCTION BUSINESSES RISKS

Rating Scale for Frequency of Occurrence		Rating Scale for Severity Effect	
Greatly often	5 and above	Very great effects	5 and above
Often	4	Great effects	4
Sometimes	3	Moderate effects	3
Seldom	2	Slightly effects	2
Never	1 and below	No effects	1 and below

Table 2

Frequency Index FI, Severity Index SI, and Ranks for Material resources Associated risks in Construction Businesses

S/N		Material resources risks	F. I.	Rnk	S.I.	Rnk
Engineers	1	Effect of weather	53.67	9	58.06	4
	2	Material procurement problem	60.76	1	56.19	7
	3	Contingencies	55.19	7	58.06	3
	4	Scarcity of some materials	55.19	5	56.19	5
	5	Materials cost inflation	48.61	3	49.16	10
	6	Delay in supply of ordered materials	50.63	10	59.00	2
	7	Materials conveyance problems	61.77	2	59.46	1
	8	Imposition of irregular taxes on producers and marketers	57.72	4	54.78	8
	9	Delivery problem	55.70	6	52.91	9
	10	Material Security	60.76	8	56.19	6
Builders		Effect of weather	47.31	9	54.36	6
		Material procurement problem	68.21	1	62.54	1
		Contingencies	62.16	3	57.73	5
		Scarcity of some materials	46.21	10	52.44	7
		Materials cost inflation	54.46	6	52.44	8
		Delay in supply of ordered materials	59.41	4	61.10	3
		Materials conveyance problems	62.71	2	62.54	2
		Imposition of irregular taxes on producers and marketers	51.16	7	49.07	9
		Delivery problem	58.86	5	59.66	4
		Material security	49.51	8	48.11	10
Architectur e		Effect of weather	27.58	3	29.21	3
		Material procurement problem	19.36	7	20.95	5
		Contingencies	15.26	10	16.51	9
		Scarcity of some materials	24.65	5	26.67	4
		Materials cost inflation	26.99	4	34.92	2
		Delay in supply of ordered materials	33.45	1	20.32	8
		Materials conveyance problems	32.27	2	36.19	1
		Imposition of irregular taxes on producers and marketers	18.78	8	20.32	6
		Delivery problem	170.02	9	14.60	10
		Material security	24.65	6	20.32	7
Quantity Surveyor		Effect of weather	22.09	4	21.05	3
		Material procurement problem	15.12	10	16.10	8
		Contingencies	15.12	9	16.10	9
		Scarcity of some materials	19.77	5	21.05	4
		Materials cost inflation	24.42	3	25.39	2
		Delay in supply of ordered materials	27.33	1	16.10	7
		Materials conveyance problems	25.00	2	26.01	1
		Imposition of irregular taxes on producers and marketers	15.70	7	21.05	5
		Delivery problem	15.12	8	16.10	10
		Material security	20.35	5	21.05	6

Field Survey: 2024

For the Engineers in table 2, it indicates that out of the 10 risks associated with the material resources management, delay in supply of ordered materials ranked the topmost in frequency and in severity, materials cost inflation ranked the topmost. For Builders, scarcity of some materials and material security were obtained in frequency

and severity indexes respectively. Meanwhile, Architects had contingencies ranked 10 in frequency of occurrence, and delivery problem ranked10 in severity. However, material procurement problem and delivery problem ranked the highest in frequency and severity for Quantity surveyors' team.

Table 3

Frequency Index, F.I., Severity Index S. I. and Ranks for Design / Drawing and Planning Associated Risks in Construction Businesses

S/N	Design and Drawing /planning Risks	F. I.	Rnk	S.I.	Rnk
Engineers	Indecisiveness of some clients	76.83	2	73.78	4
	Poor communication between teams	83.17	1	82.61	1
	Uncertainty in plan approval by local authorities	59.05	7	58.65	8
	Lack of adherence to professional briefing				
	Imperfections in Design and drawings	57.14	8	58.65	7
	Incomplete documents/drawing	70.18	5	70.00	5
	Slow correction of design problem	63.49	6	63.06	6
	Poor planning	73.02	4	76.94	2
		76.83	2	76.31	3
Builders:	Indecisiveness of some clients	84.29	1	78.45	2
	Poor communication between teams	79.72	2	82.37	1
	Uncertainty in plan approval by local authorities	66.00	6	58.38	7
	Lack of adherence to professional briefings				
	Imperfections in Design and drawings	54.24	8	59.38	6
	Incomplete documents/drawing	58.16	7	70.88	5
	Slow correction of design problem	63.38	5	56.83	8
	Poor planning	76.45	4	75.99	4
		77.76	3	77.26	3
Architects:	Indecisiveness of some clients	27.99	7	28.11	6
	Poor communication between teams	25.19	8	29.55	5
	Uncertainty in plan approval by local authorities	29.29	6	30.99	3
	Lack of adherence to professional briefings				
	Imperfections in Design and drawings	31.49	3	28.11	7
	Incomplete documents/drawing	34.29	2	30.99	3
	Slow correction of design problem	25.89	5	31.71	2
	Poor planning	30.79	4	33.15	1
		34.99	1	27.39	8
Quantity Surveyors	Indecisiveness of some clients	22.84	6	24.82	4
	Poor communication between teams	19.38	8	20.44	8
	Uncertainty in plan approval by local authorities	9.38	3		7
	Lack of adherence to professional briefings	26.99	4	24.09	6
	Imperfections in Design and drawings	26.30	1	24.09	2
	Incomplete documents/drawing	28.37	7	27.01	3
	Slow correction of design problem	20.76	5	25.22	4
	Poor planning	25.61	2	24.82	1

Table 3 shows the Frequency Index, F.I., Severity Index S. I. and Ranks for Design / Drawing and Planning associated Risks in table2 shows the principal factors for Engineers, are uncertainties of plan approval by local authorities and lack of adherence to professional briefing. For Builders, lack of adherence to professional briefings and

incomplete documents/drawing are the topmost FI and SI. For Architects, Poor communication between teams and poor planning from the Architects were rated the topmost. The Quantity surveyors team also had poor communication between teams ranked as the topmost risk in both frequency and severity.

Table 4

Frequency Index F. I., Severity Index S.I. and Ranks for Labour Associated Risks in Construction Businesses

S/N	Construction/ Labour Risks	F. I.	Rank	S.I.	Rank
Engineers	Insufficient skilled workforce	195.12	4	189.07	2
	Manpower deficiency	186.12	2	194.24	4
	Low self-motivation among workers	194.35	1	182.49	3
	Construction injuries and hazards	179.53	3	191.44	3
Builders	Insufficient skilled workforce	200.24	2	194.04	1
	Manpower deficiency	200.26	4	177.02	3
	Low self-motivation among workers	186.67	1	188.94	2
	Construction injuries and hazards	173.09	3	196.08	4
Architects	Insufficient skilled workforce	86.81	1	80.00	2
	Manpower deficiency	81.70	2	87.44	1
	Low self-motivation among workers	86.06	4	72.56	3
	Construction injuries and hazards	71.49	3	82.05	4
Quantity Surveyors	Insufficient skilled workforce	70.18	1	67.89	2
	Manpower deficiency	66.67	2	77.06	1
	Low self-motivation among workers	86.06	4	55.05	3
	Construction injuries and hazards	63.16	3	82.05	4

Labour Associated Risks (table 4), shows fairly staggered significant factors for the four teams. Insufficient skilled workforce and shortage of manpower for Engineers were significant factors.manpower deficiency and insufficient skilled workforce in both frequency and severity were ranked by the builders. Low self-motivation among workersand construction injuries and hazards were topmost in both frequency and severity ranking by both Architects and Quantity surveyors.

Table 5
Comparison of Relative Importance Index RII of Risk Management Approaches in Curbing Associated Risks in Construction Businesses

Risk Management Approaches	Engineers		Builders		Architects		Surveyors	
	RII (N 28)		RII (N 28)		RII (N 12)		RII (N 10)	
Application of green construction practices	108	0.771	110	0.785	50	0.833	85	1.700
Regular site meeting with all functional multidisciplinary team	98	0.700	92	0.657	46	0.767	46	0.920
Administration of proportionate incentive packages to workers	111	0.793	80	0.571	40	0.667	40	0.800
Promote team working among multidisciplinary teams	97	0.693	100	0.714	50	0.833	50	1.000
Proper project planning, specification and scheduling	98	0.700	104	0.743	56	0.933	56	1.120
Timely submission and facilitation of prompt approval from local authorities	101	0.721	93	0.664	46	0.767	46	0.920
Proper checking of working drawing by relevant teams	101	0.721	120	0.857	60	1.000	60	1.200
Adherence to professional briefing	100	0.714	94	0.671	47	0.783	47	0.940
Application of green construction practices	103	0.736	96	0.686	48	0.800	48	0.960
Hire experience personnel for project implementation	106	0.757	90	0.643	45	0.750	45	0.900
Build a systematic project control and monitoring mechanism	104	0.743	92	0.657	30	0.500	30	0.600
Proper planning	111	0.793	93	0.664	46	0.767	46	0.920
Ensure the availability of resources	110	0.786	108	0.771	54	0.900	54	1.080
Select a competent project manager		0.750	97	0.693	85	1.417	50	1.000
Use the appropriate construction methods	106	0.757	115	0.821	57	0.950	57	1.400

Tables 5 compared relative importance of the risk management approaches suggested for curbing the occurrence of theserisks.Among the multidisciplinary teams, Engineers proffered application of green construction practices, ensuring the availability of resources, on the side of the builders, timely submission and facilitation of prompt approval from authorities was submitted by Architects, while proper project planning, specification and scheduling was quantity surveyors submission.

Discussion of Findings

The findings of this study provide a comprehensive understanding of the risk factors associated with construction projects in Nigeria. The results indicate that material resources, design and drawing/planning, and labor are the most significant risk factors perceived by the multidisciplinary construction teams. The associated risks as identified in tables 1, 3, and 4 are all activities likely to cause delay in the construction project. This indicates that the teams are aware of the risks' occurrence as well as their responsibilities in managing them. This conviction is in line with ANSI/PMI 99-001-2017, (2017) stating that effective risk identification involves clarifying risk responsibilities and ensuring that all

stakeholders are aware of their roles and responsibilities in managing risk.

Consequently, delay in construction business actually risks untimely completion of the project and subsequent abandonment of the uncompleted project resulting to cost swarming. This is evident in Owolabi, et al., (2014) supporting, that delays can incite negative effects such as increased costs, loss of productivity and revenue; contractual disputes and lawsuits between owners and contractors; and contract termination. Department of environment (2008), cited in Odeyinka (2018), revealed delay risks and their great push effect on cost of Sydney Opera House in Australia. The project started in 1958 and was planned to complete in 3 years (1961) but delayed by forces of uncertainty to complete over 10 years later in 1973 with cost overrunning from $7million to $102 million i.e. 1357% higher. Observation shows that many construction projects delay in Nigeria presents worse-case scenarios than the Opera House portrayed above, highlighting the need for risk management approach in material resources.

The prominence of material resources as a risk factor is consistent with existing literature, which highlights the vulnerability of construction projects to material-related risks such as cost inflation, availability, and quality (Aibinu et al., 2020; Kaliba, Muya, & Mumba, 2009). However, the study also presents significant severity effects viz, materials cost inflation, material security, and delivery problems indicating that material resources are a major concern for multidisciplinary construction teams in Enugu state, and emphasizing the need for effective material management strategies. This is particularly important in the context of Nigeria's construction industry, where material costs can account for up to 60% of total project costs (Ogunbiyi et al., 2020).

The study's findings also underscore the importance of design and drawing/planning as a risk factor. Delays in approval, lack of effective communication between teams, and inadequate project documentation were identified as key risks associated with design and drawing/planning. These findings are consistent with research that highlights the critical role of design and planning in construction project success (Owolabi et al., 2014; Zhang et al., 2019). The results of this study suggest that construction teams in Nigeria need to prioritize effective design and planning strategies to mitigate the risks associated with this phase of the project.

Furthermore, the study's results indicate that labor-related risks are a significant concern for construction teams in Nigeria. The findings suggest that Engineers and Builders have related experiences in labor-associated risks, while Architects and Quantity Surveyors have distinct perspectives on these risks. This highlights the need for effective labor management strategies that take into account the diverse perspectives of construction team members. This is particularly important in the context of Nigeria's construction industry, where labor costs can account for up to 30% of total project costs (Ogunbiyi et al., 2020).

The study's findings also provide insights into the relative importance of risk management approaches for mitigating construction project risks. The results indicate that green construction practices, regular site meetings, timely submission and approval, and proper project planning are essential risk management strategies for construction teams in Nigeria. These findings are consistent with research that highlights the importance of proactive risk management strategies in construction projects (Zhang et al., 2019; Liu et al., 2020).

Conclusion

The findings of this study have implications for construction project management practices and research. The study's results highlight the need for

construction teams to adopt effective risk management strategies that address the unique risk factors associated with construction projects in Nigeria. Furthermore, the study's findings provide a foundation for future research on construction project risk management in Nigeria, particularly in the areas of material management, design and planning, and labor management.

Dwelling on the findings of the study, it is obvious that the construction industry is plagued by persistent risks that may lead to project delays, contractual dispute, abandonment, health and safety issues, andcost overruns. These risks can result in significant losses, including loss of life on construction sites. Therefore, as effective risk management is crucialto effective project delivery in construction industry, knowledge of the existence of these risks can be a powerful tool, but its misapplication can have disastrous consequences. For the understanding of the level of risk management awareness and compliance among construction teams, the study provided insights into improving risk management practices and reducing the likelihood of ceaseless occurrences and the adverse outcome.

Recommendations

Based on the findings of this study, the following recommendations are made;

1. Construction companies should develop and implement comprehensive risk management plans that identify, assess, and mitigate potential risks. This plan should be regularly reviewed and updated to ensure its effectiveness.
2. Construction professionals should receive regular training and education on risk management principles, practices, and tools to enhance their awareness and compliance.
3. Construction companies should establish a culture of risk management that encourages a proactive approach to identifying and mitigating risks. This culture should be promoted through leadership, communication, and incentives.

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