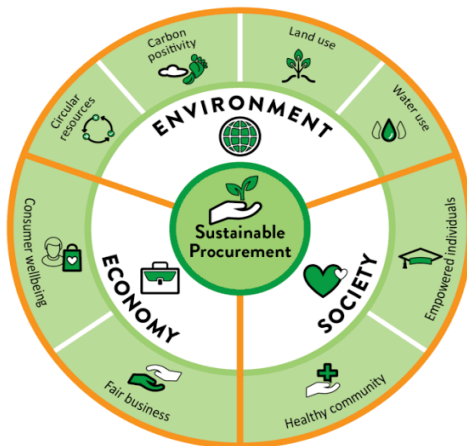




**THE FEDERAL UNIVERSITY OF TECHNOLOGY,
AKURE, NIGERIA**

**INTEGRATING PROCUREMENT MODELS, RISK
MANAGEMENT AND STAKEHOLDERS'
EXPECTATIONS FOR SUSTAINABLE CONSTRUCTION**

INAUGURAL LECTURE SERIES 201



Delivered By

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Professor of Quantity Surveying and Procurement Studies

Tuesday 23rd June, 2026



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PROTOCOL

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Members of Administrative and Technical Staff of the
University
Distinguished Professional Colleagues,
My Lords Spiritual and Temporal,
Distinguished Guests and Friends of the University,
Gentlemen of the Press,
Distinguished Ladies and Gentlemen,
Great FUTARIANS.

PREAMBLE

“Bless the Lord, O my soul: and all that is within me, bless His holy name. Bless the Lord, O my soul, and forget not all His benefits” (Psalm 103:1-2). Madam Vice Chancellor, it is with a heart filled with gratitude and appreciation to the Almighty God, who has granted me the grace to stand before this highly esteemed assembly of scholars and distinguished elites to deliver the 201st Inaugural Lecture of the Federal University of Technology, Akure

entitled - *Integrating Procurement Models, Risk Management and Stakeholders' Expectation for Sustainable Construction*. This Inaugural Lecture is the 25th from the School of Environmental Technology and the 3rd in the Department of Quantity Surveying. The first one in the Department was delivered by Professor D. R. Ogunsemi on Tuesday 18th August 2015 and the second by Professor I. O. Aje on Tuesday, 27th July 2021. I start by giving glory, honour, and adoration to the Almighty God. The One who made today a reality and spared my life to see this day. I am immensely thankful to You Lord, the King of kings and the Lord of lords for taking me from obscurity to this high pedestal such that I am celebrated today by this esteemed audience. I owe everything I have become today and what I will ever be, entirely to You, Lord. To You alone be all the glory.

Madam Vice Chancellor, my journey into the world of Quantity Surveying began when I was admitted into the Department of Quantity Surveying of the Polytechnic Ibadan in September 1989. This was after several failed attempts to secure admission to study Medicine in the University; at that time, I did not know a thing about Quantity Surveying. A friend who had been admitted to The Polytechnic Ibadan the previous year advised me that, with my O'level results, I would be admitted if I chose Quantity Surveying. Therefore, I obtained the form that year, picked Quantity Surveying, got admitted and completed my OND programme in 1991. I applied for Direct Entry admission into the Federal University of Technology, Akure in 1992, seeking a Bachelor's degree in Quantity Surveying, and was subsequently admitted. With the help of God and my dedication, I emerged as the Best Graduating Student in the entire School of Environmental Technology during the 1997 graduating year. After the one-year National Youth Service in 1999, I joined the services of the University in the Department of Quantity Surveying as a Graduate Assistant in 2000. The same year I enrolled for a

Master's degree in Quantity Surveying in the same department. However, the journey was not without its difficulties; at that time, I was serving in the department as a Graduate Assistant, combining academic work with departmental responsibilities. By 2003, after spending about three years on the Master's programme, a major turning point occurred: some of us serving as graduate assistants were relieved of our positions on the grounds that we had exceeded the permitted duration for completion of the Master's programme.

Although this development was discouraging, it did not diminish my determination to complete the programme. Later in 2003, I successfully completed the Master's degree in Quantity Surveying and passed the professional qualification examination the same year. I reapplied to the department and was subsequently reappointed as an Assistant Lecturer. With this renewed opportunity, I enrolled for a PhD programme the same year. However, progress on the programme proved extremely difficult because at the time, the department faced significant constraints, including a shortage of senior academics capable of supervising doctoral research and limited research resources. These challenges made it almost impossible to make meaningful progress on the doctoral programme. A major breakthrough eventually came in 2008, when my PhD co-supervisor Professor Stephen Olubodunwa Ogunlana who was then at Asian Institute of Technology (AIT) Thailand moved to Heriot-Watt University in Edinburgh, Scotland, and then I had the opportunity to travel to the United Kingdom to pursue doctoral studies at Heriot-Watt University in Edinburgh, Scotland. At Heriot-Watt University, I commenced my doctoral studies in Construction Project Management. After years of intensive study, research, and scholarly engagement, I successfully completed my PhD in 2012. This experience profoundly expanded my academic horizons and strengthened my capacity for research, teaching, and professional

contribution to the construction industry. Upon returning to Nigeria in 2012, I resumed my academic duties. Through dedication and grace, I progressed through the ranks and was promoted to Professor in the Department of Quantity Surveying in 2019.

Madam Vice-Chancellor, the foregoing represents a concise summary of my academic journey to date. My journey reinforced a personal conviction that academic progress is often shaped not only by intellectual ability but also by resilience, perseverance, and faith in the possibilities that lie beyond temporary setbacks. It is therefore, with a deep sense of humility and honour that I present today, the inaugural lecture titled: **Integrating Procurement Models, Risk Management and Stakeholders' Expectation for Sustainable Construction.**

1.0 Introduction

1.1 The Construction Industry at Crossroads

Construction, according to the United Nations' definition comprises *'economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams and so forth'* (United Nations, 2001). Construction activity represents a significant share of the economies of most countries in terms of its contribution to GDP and total employment and it is also an important market for materials and products produced by other sectors of the economy (Ruddock, 2007). It was further argued that viewing construction as merely the act of building is too narrow a perspective, and that what construction must address is far more wide-ranging, representing a considerable economic and social challenge. It also suggested that construction activity involves the production and management of the living and

working environment of the whole population, in fact, the entire built environment, as distinct from the natural environment (see Figure 1 for broad and narrow definition of construction industry).

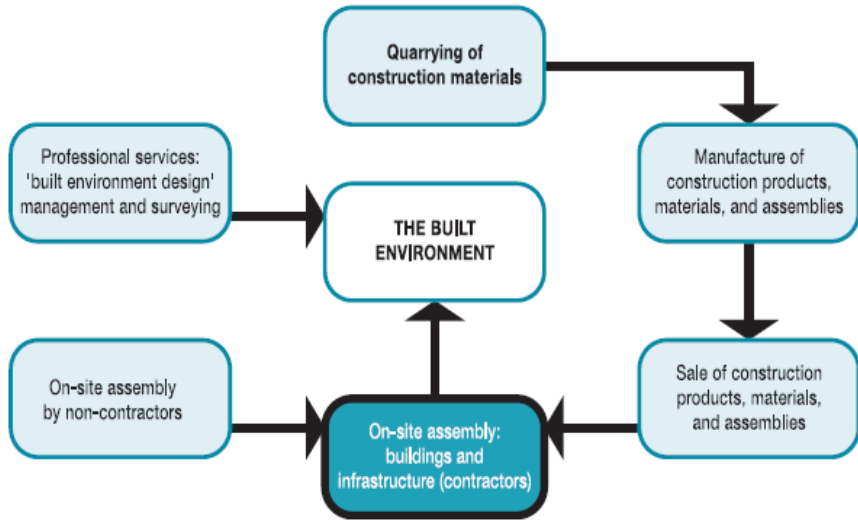


Figure 1 Broad and narrow industry definitions
(Source: *The Pearce Report, 2003 adapted from Ruddock, 2007*).

Therefore, on that basis, the construction industry can be defined as that section of the economy responsible for the production and management of both the living and working environment of the whole population and the entire built environment.

The construction industry occupies a paradoxical position in national development; it is widely acknowledged for its vital economic role and contribution to countries' GDP. It is a catalyst for economic growth, infrastructure provision, employment generation, and technological advancement. According to the Construction Industry Report (CIR, 2025), the Nigerian

construction industry remains a vital pillar for national economic growth and development, contributing approximately ₦6.5 trillion (4% of GDP) in 2024, with a projected annual growth of around 7% for 2025. The sector spans residential, commercial, industrial, and infrastructure segments, with public infrastructure projects driving over 60% of output, reflecting the government's determined agenda to address Nigeria's vast infrastructure deficit estimated at \$3 trillion over the next 30 years. Urbanisation and population growth are significant demand drivers, intensifying the housing shortage, with over 31 million units needed to bridge the gap (Construction Industry Report, 2025).

The construction industry in Nigeria is projected in the report to expand by 2.8 percent in real terms in 2024, supported by the government's focus on infrastructure development to support economic development, public and private investment in the housing sector, and a strengthening of external demand. In the 2024 budget, the Government of Nigeria (GON) allocated \$16.8 billion for capital expenditure of which \$3.7 billion was allocated to the education sector and \$2.2 billion to the health sector. The GON also allocated \$922.2 million for road construction and \$166.4 million towards the development of 20,000 affordable housing units in 2024. Over the remainder of the forecast period, the construction industry is expected to record an annual average growth of 3.1 percent between 2025 and 2028. This growth is supported by investments in electricity, transport, industrial, infrastructure, and oil and gas projects, coupled with the GON's plan to produce 5.5 billion cubic feet of gas per day by 2030 (NBS, 2024).

Despite these, the construction industry is persistently associated with cost overruns, time delays, quality failures, disputes, and sustainability deficits. This contradiction is particularly evident in developing economies such as Nigeria, where infrastructure

deficits coexist with significant public and private investment in construction projects. My early and subsequent researches provide empirical insight into this paradox. For instance, our investigation into stakeholder management in privately financed market projects in Nigeria (**Awodele et al., 2011**) revealed that many project failures were not primarily technical but institutional and relational. Projects suffered because procurement decisions were made without adequate consideration of stakeholder interests, risk ownership, and governance capacity. These findings align with broader international scholarship which identifies fragmentation and poor integration as core weaknesses of the construction industry.

Procurement models determine how responsibilities, incentives and risks are shared among project actors; they define the organisational structure through which construction projects are conceived, financed, designed, and delivered (**Awodele et al., 2012**). Traditional procurement approaches such as Design-Bid-Build emphasise competitive tendering and cost minimisation but tend to constrain innovation and early collaboration. They often encourage fragmentation and adversarial relationships (Pınar & Başar, 2023). Newer models such as Public-Private Partnerships (PPPs) and Integrated Project Delivery (IPD) promote collaborative risk-sharing, early contractor involvement and lifecycle performance assessment, making them more suitable for projects with sustainability expectations (Springer, 2025). However, adoption of such models in developing economies remains low due to institutional, financial, and capacity constraints (Unegbu et al., 2025). This aligns with our work highlighting capability gaps among indigenous contractors in competing for specialised infrastructure projects (Akinsiku & Oyediran, 2020; Aghimien, Adegbembo, Aghimien & **Awodele, 2018a**).

Risk management has increasingly become central to procurement delivery. Poor risk identification, risk allocation and mitigation strategies contribute to time overruns, cost escalations and performance inefficiencies globally (Ogunde *et al.*, 2025). In Nigeria, weak contractual structures and limited risk management competence further expose infrastructure projects to disputes, claims and renegotiations (Sanni *et al.*, 2024; Esan *et al.*, 2025). Aghimien **Awodele**, Oke, & Aghimien. (2018b) emphasised that risk mitigation in developing countries requires stronger institutional frameworks, improved contractor capacity and better designed procurement incentives to encourage sustainable practices. Stakeholder expectations have also evolved beyond traditional time–cost–quality metrics toward sustainability, environmental performance, lifecycle value and community acceptance. Early stakeholder engagement improves alignment of value expectations, reduces disputes, and enhances project legitimacy (Bello *et al.*, 2024). Nigerian studies revealed, however, that stakeholder conflicts, poor communication and unclear governance structures continue to undermine project performance, especially in public infrastructure procurement where client, regulator, end-user and community expectations differ (Ogunde *et al.*, 2025; Sanni *et al.*, 2024). Our contributions in sustainable construction delivery further argued that misalignment of stakeholder expectations and procurement choices remains a major barrier to integrating sustainability into construction practice in Nigeria (Aghimien **Awodele**, Oke, & Aghimien. 2018b).

Globally, sustainability demands have intensified the need for procurement strategies that promote low-carbon materials, circular resource flows and lifecycle costing. Yet, in Nigeria, sustainability adoption remains low due to high upfront costs, inadequate incentives, and weak regulatory enforcement (Ade-Ojo & **Awodele**, 2019). **Awodele** (2017) demonstrated that

sustainable construction awareness and implementation are hindered by institutional gaps that affect procurement efficiency, contractor competitiveness and the pursuit of value for money. These findings underscored the argument for a more integrated policy and professional agenda that connect procurement reform, risk governance and stakeholder management to sustainable construction outcomes. Collectively, the literature revealed that while global industries confront similar structural challenges, the Nigerian construction sector experiences additional constraints rooted in institutional capacity, procurement design, and stakeholder governance. Integrating procurement models, risk frameworks and stakeholder expectations is therefore vital for improving performance predictability, reducing disputes, and delivering sustainable infrastructure.

Further evidence of the industry's crossroads emerges from our work on the adoption of information technology in quantity surveying practice (Ibironke, Ekundayo & **Awodele, 2011**). While digital tools were shown to enhance efficiency, transparency, and cost control, their adoption remained uneven and largely driven by individual firm capacity rather than systemic reform. This underscores a recurring theme: innovation exists, but integration is weak. The crossroads at which the construction industry stands today is therefore not a lack of knowledge, tools, or models, but the failure to deliberately integrate procurement systems, risk management practices, and stakeholders' expectations into a coherent value-driven framework. This lecture positions Quantity Surveying as a critical discipline for resolving this integration deficit and repositioning construction for sustainable development.

2.0 Conceptual Foundations

2.1 Construction Procurement System

The term Construction Procurement System (CPS) has become increasingly prominent in recent times with industry practitioners and researchers. In principle, CPS is defined as the organisational structure through which construction projects are conceived, financed, designed, and delivered. A procurement system determines the overall framework of responsibilities and authorities for participants within the construction process and is a key factor contributing to project success and hence stakeholders' satisfaction (Rwelamila, 2010). Rwelamila and Ngowi (1996) propose the definition of CPS as *“the project organisational structure, which is the collective action required to acquire the design, management, and installation inputs”*. Incorporating the various definitions of a CPS by Ireland (1982), Rwelamila and Ngowi (1996), Newcombe (1999), Rwelamila (2000) and Rwelamila (2010), CPS can be defined as **an organisational structure that defines the roles of stakeholders, the relationships between them, both formal and informal, their individual responsibilities, the sequence of activities and timing of events required to provide a facility, as well as the practices and techniques of management that are used.**

Once a client is satisfied about the real need and feasibility of the construction project within overall budgetary constraints, the natural course of action is to retain a consultant to help assess risk and devise an appropriate CPS. The client should decide how much risk to accept as no construction project is risk free. Risk can be managed, minimised, shared, transferred, or accepted but

it cannot be ignored. The basic decision on the appropriate CPS should precede the preparation of the outline project brief, since it affects who assists with the design brief. That choice of an appropriate CPS must be determined by the nature of the construction project and client's wishes over acceptance of risk. Such decisions are very difficult. Several publications, including Masterman (1992) and Hughes (1990, 1992), provide detailed accounts of different procurement systems, examining their risk distribution potential and their respective merits and demerits. Traditional procurement systems, while familiar, often encourage fragmentation and adversarial relationships. Contemporary procurement models, such as Design and Build, PPPs, and Integrated Project Delivery, seek collaboration but are frequently adopted without adequate understanding of risk and stakeholder dynamics. The different procurement models/systems are briefly discussed in the following sections.

2.1.1 Traditional Procurement Systems/Design-Bid-Build

Globally, the most commonly adopted procurement route — particularly for inexperienced or occasional construction clients — is known as the 'traditional' approach. It is seen as the 'least risk' approach, as there is a level of certainty about design, cost, and duration inherent in the strategy if it is properly implemented. These traditional procurement systems, particularly the design–bid–build approach, have historically dominated the Nigerian construction landscape. While the system offers clarity of roles and perceived cost certainty at tender stage, extensive research has shown that it promotes fragmentation between design and construction, limits innovation, and frequently results in adversarial relationships (Rowlinson & McDermott, 2005;

Hughes *et al.*, 2015). These weaknesses are amplified in complex projects where sustainability, stakeholder engagement, risk and uncertainty are critical success factors. The sequential nature of the strategy, which is necessary to ensure low risk, means that it can be relatively slow prior to the commencement of construction. Under the traditional procurement route, design should normally be completed before competitive tenders are invited and before the main construction contract is let. Consequently, the client will usually select and appoint the design team prior to the selection of the contractor. Selection may be based on experience or fees-usually both. The contractor is generally selected on best value, this, however, does not always mean the lowest price.

In this procurement method, assuming no changes are introduced, construction costs can be determined with reasonable certainty before construction starts. This may be particularly attractive to clients with strictly limited budget or a limit to their borrowing powers. In such cases, it is usual for each contractor to submit a price based upon the same work scope. The client is responsible for the accuracy of these quantities, prepared in the form of a bill of quantities (although the client can, via the contract, transfer this responsibility to the contractor). The contractor assumes responsibility and financial risk for the construction of the building works to the design produced by the client's design team, for the contract sum agreed, and within the contract period. The client takes the responsibility and risk for the design and for the performance of the design team. (see Figure 2 for the traditional procurement system)

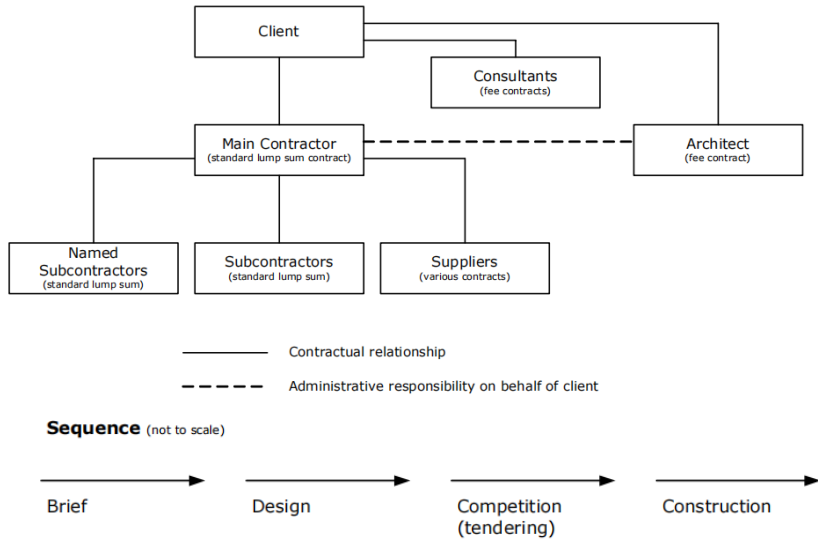


Figure 2: Typical Project Structure under the Traditional procurement route

2.1.2 Design and Build Procurement Systems

Under a ‘design and build’ route, a single contractor assumes the risk and responsibility for designing and building the project, usually in return for a fixed-price lump sum. Because this approach includes the integration of design and construction. Construction can start before all the detailed design is completed, and the overall project duration is thus reduced. It has now been clearly established that a design and build contractor may have a legal duty to provide the employer with a building that is fit for its purpose. This is a significantly higher duty than that assumed by an architect or other designer under a traditional route, where the requirement is simply one of reasonable skill and care. Design and build contracts may exclude this fitness-for-purpose obligation. In these cases, the contractor may undertake merely to design to the same standard ‘as would an architect or other designer if the employer had engaged one direct’. Some clients

are now, however, insisting on fitness for purpose in their design and build contracts, stating that where there is a discrepancy between the employer's requirements and the contractor's proposals, the statement of employer's requirements will prevail. To be effective, however, the statement of employer's requirements needs to be clear, complete, and unambiguous. Design and build provides a range of options: from a "package deal" where the client has little involvement in the design development or procurement process to a 'develop and construct' route where the client appoints designers to draw up a brief to a level of sophistication, leaving the design and build contractor to develop detailed or specialist design elements (see Figure 3). Standard forms of design and build contract are available.

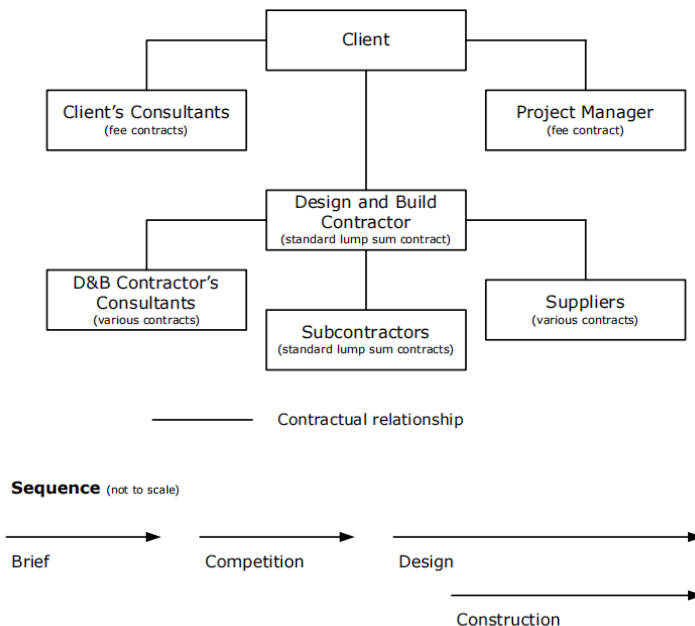
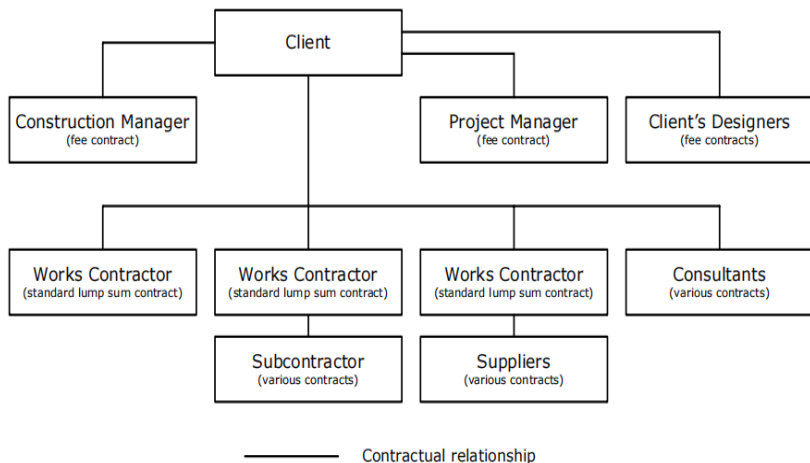


Figure 3: Typical Project Structure under the Design and Build procurement route.

2.1.3 Construction Management Route

Under a construction management route (see Figure 4), the client does not allocate risk and responsibility to a single main contractor. Instead, the client employs the design team, with a construction manager engaged on a fee basis to manage, programme and co-ordinate the design and construction activities and to facilitate collaboration among project participants. Construction work is carried out by individual ‘trade’ contractors, often specialists, through direct contracts with the client for distinct trade or work packages. Each trade/work contractor will be appointed when their contribution is required. The arrangement enables the design process to overlap with the construction process to some extent; this route is therefore usually adopted where the primary objective for the client is achieving an early completion date. However, this is a strategy with little cost certainty for the client at the outset because the costs are based on a budget provided by the construction manager or the quantity surveyor and the actual costs of the trade contracts will often be unknown until that work is completed.



Sequence (not to scale)

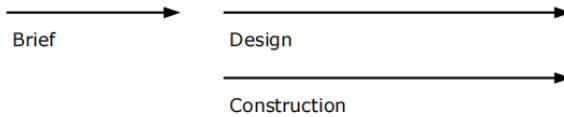


Figure 4: Typical Project Structure under the Construction Management route

2.1.4 Management Contracting Route

The Management Contracting procurement route is characterised by the client's appointment of a management contractor early in the process to advise on the design programming and buildability. The Management Contractor programmes, packages, and obtains tenders for the works which are each let on a competitive basis on lump-sum, firm-price contracts with the management contractor. In return, the contractor is paid a fee on top of the construction costs for doing so. The fee is based on the estimated costs of the works as established by the quantity surveyor usually adopting a cost plan as the basis for budgeting. Construction works are carried out by firms employed by the management contractor, referred to as works contractors. Unlike construction management, the management contractor has direct contractual links with all the works contractors and is responsible for all the construction works. There is no contractual link between the employer and the works contractors (see Figure 5).

The management contractor may provide some of the common services on site, such as office accommodation, tower cranes, hoists and security which are shared by the works contractors. However, in 'pure' management contracting, such works are let as a self-contained work package. The client employs the design team and, therefore, bears the risk of that team delaying

construction for reasons other than negligence, such as the late receipt of design information.

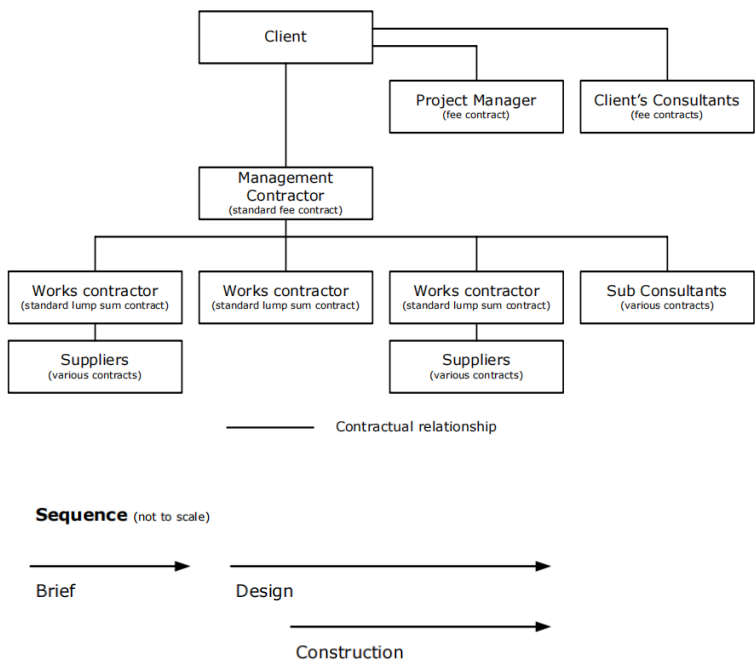


Figure 5: Typical Project Structure under the Management Contracting route.

2.1.5 Partnering

Partnering is a concept that can be applied to many procurement routes; it is a cooperative relationship between business partners formed to improve performance in the delivery of projects. It is not, in itself, a procurement route. Partnering is best considered as a set of collaborative processes which emphasises the importance of common goals and raises questions as how these goals are agreed on, at what level they are specified and how they are articulated. Partnering is applied either in a project situation

known as project partnering or in a long-term relationship known as strategic partnering.

In the partnering approach, negotiation rather than competitive tendering is the key. The risks that both parties face are made transparent at the outset, and these are allocated based on which party is best positioned to bear or insure against them. The essence of any partnering agreement now involves a duty of good faith, cooperation and trust between all parties involved in the construction process.

2.1.6 Public Private Partnerships (PPP)

Public-Private Partnerships are arrangements where a project or service is provided by the private sector in partnership with the public sector. There are many such arrangements; the best known in the construction sector is Private Finance Initiative (PFI), and other more recent variants. A PPP project involves a long-term contractual arrangement (usually of 25–30 years) between public- and private-sector parties through a concession agreement. The private sector agrees to finance, build and operate an infrastructure project such as a hospital, school, road or prison. This includes long-term life-cycle investment and routine maintenance services, sometimes together with ‘soft services’ such as catering and cleaning whereby the public sector benefits from the use of the facility without bearing direct responsibility for its operation. A PPP project is usually achieved through the creation of a company known as a Special Purpose Vehicle (SPV). In return, the SPV either collects toll revenue or receives a payment stream — perhaps annual or unitary — from the public sector over the life of the concession. This will be subject to the delivery of the services to the specification set out in the concession agreement – there is no payment for poor delivery or performance (see Figures 6 and 7 for the examples of non-toll based and toll-based PPP schemes respectively).

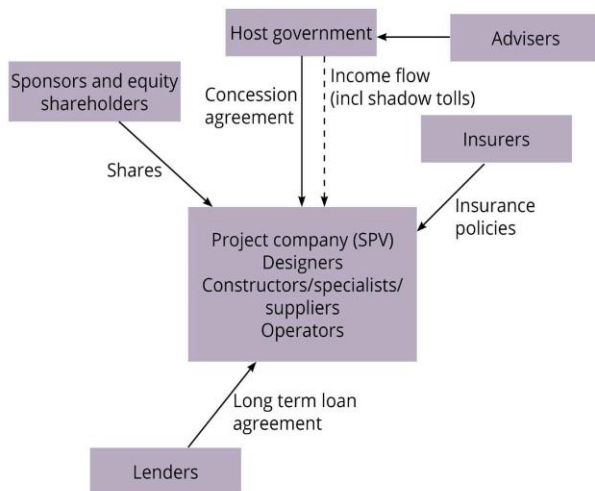


Figure 6: Example of PPP scheme – non-toll based.

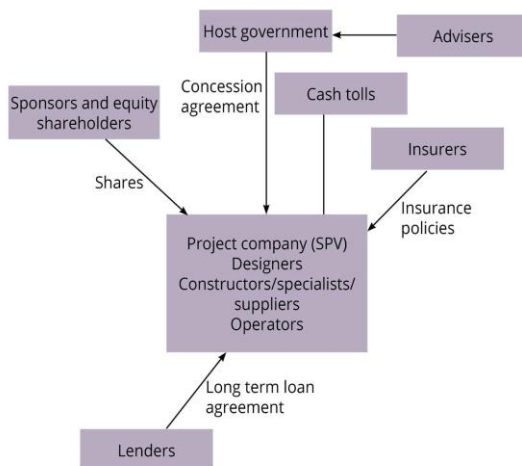


Figure 7: Example of PPP scheme – toll based.

2.2 Risk and its Management

The main objective of project management is to maintain a healthy balance between the three conventional objectives of any construction project—cost, time and quality—which are collectively called the 'iron triangle'. Anything that can threaten the achievement of these objectives, and prevent the project manager from meeting cost, time, quality, and any other objectives predefined for the project is considered as a risk to the project. Risk can affect productivity, performance, quality, and budget of a construction project (Kangari, 1995). Risk is therefore inherent in every human endeavour and in every decision-making process, including design and planning, and can be difficult to manage effectively. As such, it is important to develop a proper risk management framework, both in theoretical and in practical terms (Wang et al., 2004).

Many researchers have defined risk based on their perceptions and the needs or outcomes of their studies. For example, Wideman (1986) and Akintoye and Macleod (1997) defined risk as the likelihood of unforeseen factors occurring, which would adversely affect the successful completion of the project in terms of cost, time, and quality. Cooper and Chapman (1987) defined risk as 'the exposure to the possibility of economic or financial loss or gain, physical damage or injury, or delay as a consequence of uncertainty associated with pursuing a particular course of action.' In this respect, Skorupka (2008) noted that the term 'risk' was derived from an Italian verb 'riscare', which means 'to dare to do something'. The concept of risk, however, carries different meanings across different professions. Economists focus

primarily on its financial dimensions; engineers associate risk with process disruption and cost implications; the military frame it in terms of the probability of mission failure; police officers treat it as a threat to public safety; and employees tend to perceive it as the possibility of job loss. It is therefore imperative to clearly specify the meaning of risk in this context. The Project Management Body of Knowledge Guide (PMBOK, 2004) defines project risk as an uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective, such as time, cost, scope, or quality. This definition contains two significant implications: first is the possibility that there will be loss or gain in any risk situation, second is the effect the occurrence of either loss or gain will have on the project. Risk is about deviation from a desired target, and loss and gain are always possibilities. It is possible to have cost over-run or cost under-run, and it is also possible to have time over-run or under-run. However, when there is positive gain, most people are not concerned, but when adverse effects are experienced (i.e. when the project manager fails to meet the set objectives), people express dissatisfaction or concern with the outcome.

Kezsbom and Edward (2001) asserted that risk management is an integral element of project management. All managers engage with risk, whether consciously or unconsciously, but rarely do so in a systematic manner. Managing risk is fundamentally a forward-thinking endeavour, through which individuals or groups examine future possibilities within a given process or undertaking to identify, in a responsible and structured manner, the potential downsides and upsides of particular actions or inactions. This disciplined approach promotes balanced thinking and provides a

framework for more effective and informed decision-making. Risk Management is therefore all about maximising opportunities, that is, increasing the probability and impact of positive events, and decreasing the probability and impact of events adverse to the project. While corporate governance can be said to be the 'glue' that holds the organisation together in pursuit of its objectives, risk management provides the resilience. Risk management can therefore be said to be a formal and orderly process of systematically identifying, analysing and responding to risks throughout the life cycle of a project, to obtain the optimum degree of risk elimination, mitigation and/or control. Construction risk is unavoidable. It ranges from cost escalation and design errors through regulatory changes, to environmental hazards, and social conflicts. Risk management, therefore, should not be reactive but proactive and embedded at the procurement stage. In the context of a construction project, risks are those factors that can jeopardise the successful implementation of construction procurement efforts or the realisation of the expected benefits (i.e. efficiency, reduction in cost or increase in revenues). This therefore underscores the need for their management.

2.3 The Risk Management Process

Risk management occupies a central position in construction project performance due to the inherent uncertainty, complexity, and interdependence of construction activities. Risks in construction projects arise from diverse sources, including design incompleteness, cost volatility, contractual ambiguities, regulatory changes, environmental factors, funding instability, and stakeholder behaviour. The PMBOK Guide (2004) defines

risk management as the processes concerned with identifying, analysing, and responding to uncertainty throughout the project life cycle. It includes maximising the result of positive events and minimising the consequences of adverse events. The body of knowledge asserts 'to be successful, the organisation must be committed to addressing the management of risk proactively and consistently throughout the project.

PMBOK (2004) outlines six stages of the risk management process:

1. *Risk Management Planning*: deciding how to approach, plan and execute the risk management activities for a project.
2. *Risk Identification*: determining which risks might affect the project and documenting their characteristics.
3. *Qualitative Risk Analysis*: prioritising risks for further analysis or action by assessing and combining their probability of occurrence and impact.
4. *Quantitative Risk Analysis*: numerically analysing the effect on overall project objectives of identified risks.
5. *Risk Response Planning*: developing options and actions to enhance opportunities, and to reduce threats to project objectives, and
6. *Risk Monitoring and Control*: tracking identified risks, monitoring residual risks, identifying new risks, executing risk response plans, and evaluating their effectiveness throughout the project life cycle.

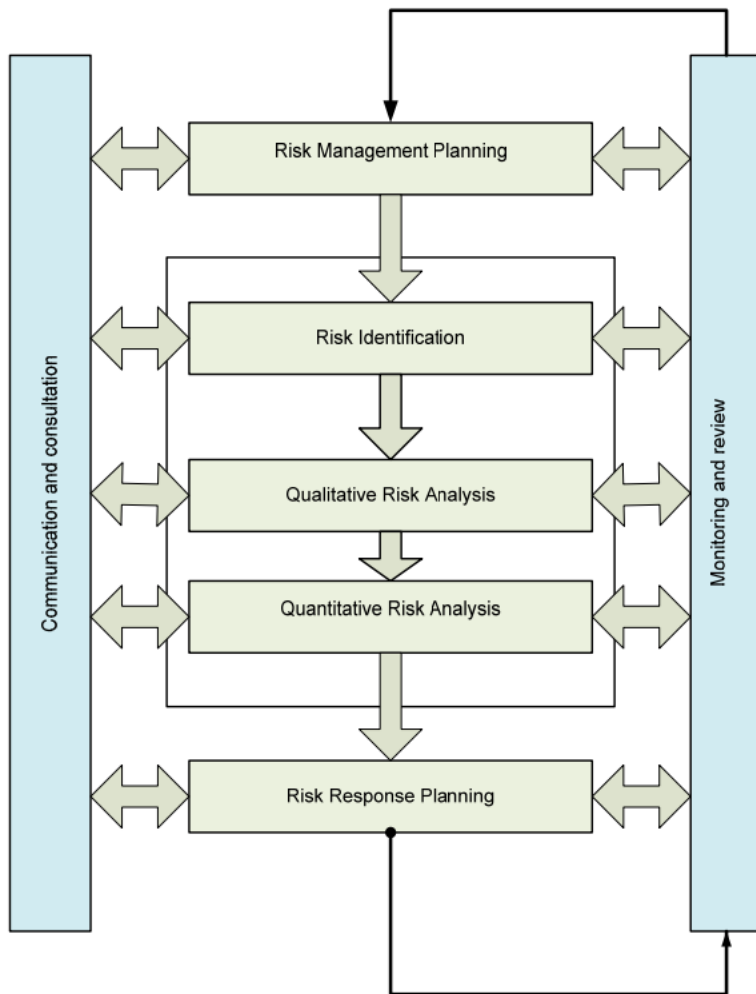


Figure 8. Risk Management Processes

Source: Adapted from AS/NZS 4360:2004, *Risk Management Guidelines*

It should be noted that risk management is not just a linear process but rather an iterative one, as these processes often interact with each other, and also with processes in other knowledge areas of project management. Each process can involve effort from one or more persons (or groups) based on the needs of the project. Each process occurs at least once in every project and may recur across multiple phases if the project is divided into phases. (see Figure 8). Despite this reality, risk management in many construction projects particularly within developing economies remains reactive, fragmented, and insufficiently institutionalised. Before moving on to how risk management can be integrated into construction process improvement for sustainable construction, it is important to understand the different stages involved in the risk management process.

2.3.1 Risk Management Planning

“Winning is the science of being totally prepared” and “to fail to plan is plan to fail” are two popular maxims that highlight the importance of planning in any enterprise yet most often such planning is taken for granted. Kerzner (2009), with characteristic wit, observes that the only 'benefit' of failing to plan is that failure arrives as a complete surprise, rather than being anticipated through prolonged periods of uncertainty. Risk Management Planning is therefore a crucial part of the risk management process, and indeed determines the success of all the other five processes. To be totally prepared means to be ready to deal with any situation. It therefore can be described as all efforts geared towards deciding how best to approach and conduct risk management activities for a particular project or process. Just as in general project planning where a project management plan is developed, the outcome of Risk Management Planning is the production of a risk management plan (RMP) that forms part of the overall project management plan (PMP). Risk planning

therefore helps managers assess the feasibility of risk management activities and determine whether the effort and resources required are proportionate to the level of risk exposure.

2.3.2 Risk Identification

Risk identification is essentially a process for uncovering any risks that could potentially affect a process. This step is of considerable importance because other processes such as risk analysis and response can only be performed on the identified potential risks. In this context, the process must involve an investigation into all the potential sources of process risks and their consequences. Risk identification must be done iteratively as new risks may be identified as the process of improvement progresses throughout its life cycle.

The outcome of the risk identification exercise is a document called the 'risk register'. This document includes, *interalia*, a list of identified risks, including their root causes and uncertain project assumptions. Often at the risk identification stage, the potential responses to a risk may be identified. These potential responses will also be recorded in the risk register, which becomes useful inputs to the risk response planning process. Thus, to choose the right technique for identifying risk, practitioners should consider several factors, such as the organisation's objectives, the nature of the project in terms of sizes, duration, and the company's strategies for risk management. The following are some of the tools and techniques suggested by the PMBOK guide (2004):

- documentation review
- information gathering techniques
- checklist analysis
- assumptions analysis
- diagramming techniques.

These can be supported by information gathering techniques for risk identification, which include:

- brainstorming.
- the Delphi technique
- interviews
- root cause identification
- strengths, weakness, opportunities, and threats (SWOT) analysis.

2.3.3 *Qualitative Risk Analysis*

In the risk analysis stage, managers try to estimate the overall magnitude of the risk and the expected losses. Typically, the risk event drivers and their impact drivers are determined at this stage. Any risk event that cannot be justified through probability of occurrence and impact is automatically dropped from the risk register. Broadly, risks can be analysed either qualitatively or quantitatively, depending on the purpose, required degrees of detail, and data and resources available for analysis. In qualitative analysis, risks are subjectively estimated and ranked in a descriptive manner. Jiang *et al.* (2002) described qualitative risk analysis as the process of prioritising risks for subsequent further analysis or action by assessing and combining their probability and impact. Qualitative estimation may be used: as an initial screening tool to identify risks requiring further analysis; where it provides sufficient information for decision-making; or where data or resources are insufficient for quantitative estimation. Because of such analysis, risks can be rated, for example, as high, moderate or low.

Usually, qualitative risk analysis is a rapid and cost-effective means of establishing priorities for risk response planning and lays the foundation for quantitative risk analysis. As in risk identification, review of process documentation of past experiences or lessons learned from previous projects can be good sources of information to prioritise the identified risks. With this,

an update is made to the risk register. Risks are listed in terms of their probability and impact in matrix form, which the project manager can use to focus attention on the most significant risks , where responses can lead to better project outcomes. In the risk register, risks may also be grouped by categories showing the root causes of risks or areas of the project that require particular attention or urgent attention and those that can be handled subsequently. From this, some risk items will go straight to the response stage, while some may require further analysis, for example, quantitative risk analysis.

2.3.4 *Quantitative Risk Analysis*

Quantitative risk analyses are performed on risks that have been prioritised through the qualitative risk analysis process as potentially and substantially influencing the project's competing demands (PMBOK, 2004). Quantitative risk analysis is the process of numerically analysing the effect on overall project objectives (Kloppenborg and Tesch, 2004). The evaluation of both consequences and probability is based on data from a variety of sources, for example, past project records, collected field data, experimental data (including prototype testing) and so on. Quantitative risk analysis is often used when the need to predict with confidence the probability of completing a project on time, on budget, at the agreed-upon scope, and/or the agreed-upon quality is critical (Kloppenborg, 2009). Dey and Ogunlana (2004) identified some of the quantitative risk analysis tools and techniques currently in use as: Statistical Probability Distribution; Simple Multi-Attribute Rating Techniques; Expected Value Technique; Sensitivity Analysis; Decision Trees; Bayes' Theorem; Simulation; Utility Theory; Analytic Hierarchy Process; Fuzzy-set Theory; Neuro-Fuzzy Networks, and Financial Methods.

After the identified risks have been analysed quantitatively, the risk register initiated in the risk identification stage is then

updated accordingly, where risks are prioritised according to the level or threat posed, or opportunity offered.

2.3.5 Risk Response Planning

After the risk is estimated, it should be determined whether the risk level is acceptable or not by comparing it with the acceptance criteria determined at the risk management planning stage. Risk response planning therefore involves determining in advance how to respond to each major risk. Minor risks are managed by monitoring their potential impact and responding if and when they occur. Kloppenborg (2009) identifies six types of risk response strategies that can be applied to major risks as:

1. avoid
2. transfer
3. mitigate
4. accept
5. research
6. exploit.

PMBOK (2004) categorised risk response under four main headings: strategies for threats (i.e. those risks that have negative impacts) are avoid, transfer and mitigate; strategies for positive risks (i.e. opportunities) are exploit, share and enhance; strategies for both threats and opportunities is acceptance; and contingent response strategies, which are strategies, put in place for use only if certain events occur. These approaches are not mutually exclusive; in most cases, a combination of strategies will yield the most effective solution. It is equally important to note that risk response measures should be addressed as part of the initial risk assessment during the planning stage, since many such measures may prove impossible or prohibitively costly to implement once the structure has been commissioned. Following careful consideration of the available response alternatives, the most appropriate measures should be selected and implemented. Since the treatment of one risk may itself introduce new risks, any

newly arising risks must also be identified, assessed, treated, and monitored accordingly.

For risk response action plans to be effective, they must be treated with the same seriousness as any other project task. This means they require dedicated budget allocations, schedule provisions, and labour resources, these are no different in principle from any other planned activity within the project (Smith and Merritt, 2002).

Communication and consultation are important considerations at each step of the risk management process. Effective communication can help ensure that those responsible for implementing risk management within the process under improvement and stakeholders, understand the basis on which decisions are made and why particular actions are required. Since stakeholders have significant impacts on the decisions made, it is important that their perceptions of risk, as well as their perceptions of benefits, are identified and documented, and that the underlying reasons for them are understood and addressed appropriately.

2.3.6 Risk Monitoring and Control

Risk monitoring and control is the process of identifying, analysing, and planning for newly arising risks, keeping track of the identified risks and those on the watch list, reanalysing existing risks, monitoring trigger conditions for contingency plans, monitoring residual risks, and reviewing the execution of risk responses, while evaluating their effectiveness (PMBOK, 2004). It is therefore evident that under risk monitoring and control, managers try to focus on the proposed processes and responses proffered for the identified risks. The outputs of the other five stages must be kept under review as things evolve. Changes in the environment, or simply the discovery of better information, may render the original assessment out of date,

thereby triggering the need for reassessment. There should be periodic reassessment of risks (i.e. re-measurement) and risk audits. Risk audits examine and document the effectiveness of risk responses in dealing with identified risks and their root causes, as well as the effectiveness of the risk management process. Thus, Kerzner (2009) commented that risk monitoring and control is not a problem-solving technique but, rather, a proactive technique to obtain objective information on the progress to date of reducing risks to acceptable levels. Earned Value Analysis or other methods of project variance and trend analysis (e.g. programme metrics, schedule performance monitoring and technical performance measurement) could be used to monitor overall performance and deviation from the baseline plan may indicate the potential impact of new threats. It is not generally necessary to begin the whole process over again when this happens, unless the change or deviation is particularly profound, but those parts that are directly affected by changing circumstances must be updated. Having understood what the actions are in terms of risk management and procurement models; it is important to highlight what the stakeholders' expectations are before discussing their integration for sustainable construction.

2.4 Stakeholders in Construction Project

Beyond the traditional triad of client, consultant, and contractor, contemporary construction projects engage a wider constellation of actors, including financiers, regulators, host communities, end users, professional bodies, and future generations. Each stakeholder group brings distinct interests, power dynamics, and expectations, which, if unmanaged, can significantly influence project outcomes. Moreover, each group carries expectations relating to cost, quality, time, safety, transparency, environmental protection, and social value. It implies that if diverse stakeholders are present in construction undertakings, understanding and

managing these diverse interests is therefore a critical competence for the modern construction professional.

2.5 Types of Stakeholders

Stakeholder management involves identifying and classifying stakeholders, thus facilitating both initial and subsequent engagement with them in a timely, planned and coordinated manner. This engagement involves identifying different categories of stakeholders; gathering information about them; identifying their objectives in a project; determining their strengths and weaknesses; identifying their strategies; predicting their behaviour and developing and implementing a strategy for managing these stakeholders (Cleland, 2002). Stakeholders have been grouped in several ways and some of these are discussed below. According to Winch and Bonke (2002), stakeholders in a project can be divided into internal stakeholders, that is those who are members of the project coalition or who provide finance and external stakeholders, those affected by the project in a significant way. Furthermore, stakeholders can be classified as inside and outside stakeholders (Newcombe, 2003), and direct and indirect stakeholders (Smith and Love, 2004). Another delineation considers primary versus secondary stakeholders (Carroll and Buchholtz, 2006). A primary stakeholder group is one without whose continuing participation the organisation cannot survive as a going concern, whereas secondary stakeholders are those who influence, or are influenced by, the organisation but whose engagement is not essential to its survival (Pajunen, 2006).

2.6 Construction Stakeholders' Expectations

In contemporary construction practice, the success of a project is no longer defined solely by the traditional metrics of cost, time, and quality, but by the extent to which it satisfies the diverse and often competing expectations of its stakeholders. Clients seek value for money and cost certainty; contractors pursue

profitability and manageable risk exposure; consultants are concerned with professional integrity and performance standards; end users demand functionality, safety, and durability. Governments and host communities increasingly expect transparency, environmental responsibility, and social value. These expectations extend beyond immediate project delivery to encompass life-cycle performance, sustainability outcomes, and societal impact. However, the failure to properly identify, prioritise, and integrate these expectations into procurement decisions and risk management frameworks has remained a major source of project underperformance. It is therefore imperative that stakeholder expectations are not treated as peripheral considerations, but as central determinants of value, shaping how projects are conceived, executed, and evaluated within the broader context of sustainable construction.

2.7 Need for Construction Stakeholder Management

Modern construction clients tend to manifest as dynamic configurations of stakeholders who engage with a multifaceted market (Newcombe, 2003). In projects involving multifaceted clients, large project teams and many other stakeholders, there is a pressing need for effective coordination and general management of the different stakes, and this warrants effective client leadership. This role of the client is underachieved (Latham, 1994; Egan, 1998, 2002; Boyd and Chinyio, 2006). Stakeholder management improves competence in relational matters and mitigates associated risks. To achieve a successful project outcome, the project manager must be adept at managing the interests of multiple stakeholders throughout the entire project management process (Sutterfield et al., 2006). Although principles can be adopted across boundaries, construction has its peculiarities, hence the need to develop the principles of

construction stakeholder management based on empirical research.

2.8 Sustainable Construction: The Integrating Imperative

Sustainable construction has emerged as a defining imperative for the global construction industry, driven by concerns about climate change, resource depletion, social inequality, and long-term economic resilience. However, sustainability in construction is often narrowly interpreted as an environmental agenda, focusing on energy efficiency, waste reduction, and green materials. **Awodele (2015)** stated that sustainable development focuses on improving the quality of life for the world without increasing the use of natural resources beyond the capacity of the environment to supply them indefinitely. This definition was drawn from the Brundtland Report (1987) which gave the definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This, therefore, implies that in improving the standard of living of people within a locality through the provision of infrastructure, care must be taken not to exhaust the available resources to the point whereby the future generations cannot provide for their own needs.

Akbiyikli *et al.*(2009) opined that sustainable construction is a pathway through which the construction industry can move towards a sustainable development, bearing in mind the environmental, socio-economic and cultural pillars. Chaharbaghi *et al.* (1999) noted that sustainable development is a concept based on a structure which stands on three pillars, namely, economic, social and environmental. Thus, a sustainable building can be said to be one that finds a balance between the economic, environmental, and social factors in its design, construction, use

and maintenance. Sustainable construction therefore extends beyond environmental considerations. It embraces:

- **Economic sustainability** – affordability, life-cycle value, and fiscal responsibility
- **Environmental sustainability** – resource efficiency, carbon reduction, resilience
- **Social sustainability** – safety, inclusiveness, community impact, ethical conduct (Akbiyikli *et al.* 2009).

This lecture therefore advances the position that sustainable construction is not an additional project requirement but the **outcome of effective integration**. Procurement models must be selected to support collaboration and long-term value; risks must be managed proactively across the life cycle; and stakeholder expectations must inform value definition and performance evaluation. Within this integrated framework, the quantity surveyor emerges as a central actor bridging economic, environmental, and social considerations to deliver construction projects that are resilient, responsible, and sustainable.

3.0 The Conceptual Integration Model for Sustainable Construction

3.1 Description of the Model

The central argument of this lecture is that sustainable construction outcomes emerge not from isolated technical interventions but from the deliberate integration of procurement models, risk management practices, and stakeholders' expectations. Drawing on my cumulative research across these domains, I propose an integrated conceptual model that situates **Sustainable Construction Value** at the core of project delivery (see Figure 9).

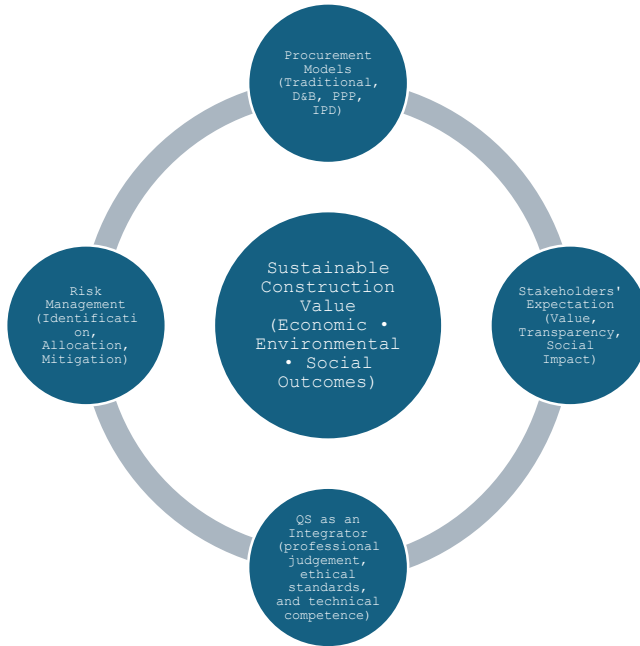


Figure 9: Conceptual Integration Model for Sustainable Construction Project Delivery

At the centre of the model is **Sustainable Construction Value**. Surrounding it are three interdependent pillars:

1. **Procurement Models** – determining structure, collaboration, and contractual relationships in any construction project.
2. **Risk Management** – identifying, allocating, pricing, and mitigating uncertainties.
3. **Stakeholders' Expectations** – defining value, legitimacy, and social license to operate

Quantity Surveyors act as the integrators, linking these elements through professional judgement, ethical standards, and technical

competence. This model emphasises that sustainability is not an add-on but an outcome of informed integration, supported by empirical evidence from our work on Public Private Partnership (PPP) risk, IT adoption surveys, and sustainable materials (**Awodele & Ogunsemi (2008)**, **Awodele et al., (2008)**, **Awodele et al., (2012a)**, and **Awodele et al., (2012b)**). Olanipekun, Ibironke, **Awodele**, and Ogunyemi, (2014). Within this model, procurement models define the structural and contractual environment of projects, risk management provides the mechanism for managing uncertainty and protecting value, and stakeholder expectations shape legitimacy, acceptance, and performance criteria. These three elements are mutually reinforcing and dynamically interrelated. Decisions taken in one domain inevitably influence outcomes in the others.

The conceptual model advanced in this lecture therefore represents my original contribution to knowledge: a quantity surveying centred framework for achieving sustainable construction through integration rather than fragmentation.

4.0 My Research Contributions

Madam Vice Chancellor, distinguished ladies and gentlemen, my research trajectory in the past two decades has contributed to knowledge advancement and professional practice in the Nigerian construction sector, particularly in areas central to sustainable development and procurement reforms. Within the mandate of Federal University of Technology Akure (FUTA) for technology-driven development, my works have:

- influenced the discourse on procurement models and successful project delivery
- informed construction risk management and stakeholder engagement practices

- supported sustainable construction and infrastructural development
- expanded the role of quantity surveyors in policy and development processes.

4.1 Discourse on Procurement Models and Successful Project Delivery

It has been established that the choice of a procurement route for construction work is one of the many important decisions that construction clients must make (Anumba and Evbuomwan, 1997). It is important for clients to objectively assess and prioritise their requirements to enable a rational comparison of alternative procurement routes. The choice of the route which best matches the client's requirement can then be made based on the relative advantages and disadvantages of the alternatives, against the criteria defined by the client (Anumba and Evbuomwan, 1997, and **Awodele, 2012**).

Many studies have been commissioned in the last seven decades to understand the reason behind the poor performance of the construction industry. For example, key industry reports include the Simon Report (1944), Phillips Report (1950), Emmerson Report (1962), Banwell Report (1964), Tavistock Report (1966), NEDO Reports (1983 and 1988), Latham Report (1994), and Egan Report (1998).

Collectively, these reports revealed a deep and persistent dissatisfaction among clients and end users with the performance of the construction industry. While the examples are drawn primarily from the United Kingdom, similar challenges have been widely reported in other parts of the world. The reports attributed poor industry performance and client dissatisfaction to three main factors: poorly structured procurement systems; fragmentation of

the industry, arising from the involvement of multiple professions and actors with differing interests; and the prevalence of adversarial contractual cultures within the industry. The traditional design-led approach which occurred largely as a natural development from the rise of the architectural profession throughout the seventeenth and eighteenth centuries in the UK has been blamed for the adversarial contractual problem in the industry (Morledge *et al.*, 2006). They argue that, although the traditional procurement method held sway for more than 150 years, by the early 1960s problems arising from the separation of design and construction functions, often evidenced by the difficulty of apportioning responsibility for defects in completed buildings, led to the development of what have been called 'integrated procurement systems' (Masterman, 2002) generally based upon a design and build approach.

Furthermore, lack of integration and fragmentation have continually been a source of problems in the attempt to improve project performance over the years thereby making the different forms of collaboration a step in the right direction (Brensen & Marshall, 2000). The review of the construction industry by Latham (1994) illustrated the extent of the adversarial processes operating in construction and the need for change. Public Private Partnership (PPP), Joint venture and partnering as procurement strategies provide some kind of solutions to the adversarial attitude associated with classical contracting which results in a win-win situation for all stakeholders involved in the process.

All these aroused our curiosity in looking at these non-adversarial procurement models available in the country. **Awodele & Ogunsemi (2008)** reported that from the available literature (CII, 1991; Cowan *et al.*, 1992; Moore *et al.*, 1992, CII, 1996, Barlow *et al.*, 1997; Bennett and Jayes, 1998; Brensen and Marshall, 2000) it is very clear that different perceptions affecting

partnership prevail. There is conformity over the general concept of partnering as a cooperative relationship between business partners in the construction industry, formed to improve performance in the delivery of projects, but there is considerable variation in definitions. In 2010, **Awodele** & Ogunsemi then carried out a study on the adaptability, suitability, and sustainability of these non-adversarial procurement models to the Nigerian situation. The result of the study led to the establishment of the key variables that can be included in the drafting of joint venture agreements for the Nigerian environment.

Furthermore, the main problem with infrastructure provision in Nigeria is the lack of sufficient means of financing and efficient management of infrastructures. Government has been the major client in the construction industry. However, public financing alone was not able to meet the estimated \$475 billion needed between 2007 and 2012 for roads, railways, seaports, airports, electricity transmission lines and other infrastructure (Omana, 2007). This led to the sourcing of an alternative method of funding by involving the private sector in design, construction, and management of infrastructures. **Awodele**, Ogunlana, and Akinradewo (2012a) assessed the investment needs of Lagos as a mega city with a view to establishing the need for alternative funding source for infrastructure development in the state. Documentary evidence was gathered, subsequently, the suitability and acceptability of PPPs within the purview of Lagos State government and Nigeria at large was assessed. The social, legal, economic, environmental, political, and technological (SLEEPT) approach was adopted incorporating the views of professionals within Lagos. The paper concluded that PPP represents a good long-term investment for private investors and has the potential to deliver much needed infrastructure in a short timeframe thus improving the quality of life of the people.

It has further been established that the PPP model of project delivery has been adopted by many nations across the world, Nigeria inclusive. However, critical questions remain: how effective has PPP proved within the existing framework of implementation, and which sectors of the economy are best suited to the scheme? These questions are particularly pertinent in the Nigerian context, where empirical investigation remains limited and the PPP debate continues to be framed in terms of "public bad, private good", a characterisation based on selective evidence rather than rigorous analysis (Kamaraswamy and Morris, 2002). Attempts were made to investigate the desirability of the model by **Awodele *et al.*, (2008)** and **Awodele *et al.*, (2012b)**. Some of the results showed that the major weaknesses of the model in Nigeria included poor internal structure management, poor negotiation ability, funding and investment problems, lack of management capability in infrastructure projects, insufficient understanding of PPP models by stakeholders, political instability, and unstable economic climate. Of course, this is why some completed PPP projects in Nigeria ended up in crises with several court cases and hostility from end users.

Also, in 2010, Ogunlana, **Awodele**, and Motawa **(2010)** argued that the concept of Public Private Partnership (PPP) is being employed in developing nations with little knowledge or history about the concept. We, therefore, reviewed reports on PPP projects in Europe, Asia, and Africa with a view to providing answer to the question, *‘is PPP the answer to the problem of market infrastructure provision in developing countries’?* Lesson learned from the review revealed that the implementation of PPP projects has been marred with some problems which have made it impossible for the scheme to deliver the promised benefits i.e. fairness, transparency, accountability, sustainability, and effectiveness/efficiency of the facility. The paper suggested that PPP can be an effective solution to infrastructure provision

only when public clients have clear and unambiguous goals, do not alter major decisions during final negotiation stages, and enact broad enabling legislation before embarking on PPP arrangements — legislation not limited to demonstration projects or a single sector. It is then PPP can be the true answer to the problem of infrastructure provision in developing nations.

In the same vein, Ojo, **Awodele**, and Akinradewo (2011) assessed the criteria used in selecting an appropriate concessionaire for PPP projects in Nigeria. The paper revealed a disparity in the opinion of the respondents on the adequacy of these criteria. The paper concluded by recommending a transparent and objective competitive bidding process in the evaluation process which is an insurance against corruption allegations; adhering to predetermined criteria to demonstrate commitment of the government and help in building the bidder confidence; reducing risk in project execution and spurring greater innovation on the part of the bidders.

To contribute to the ongoing review of the Procurement Act 2007 then, Familoje, Ogunsemi, and **Awodele (2015a)** attempted to compare the 2007 Procurement Act (PPA 2007) with the earlier UNCITRAL model law and Procurement Acts of some selected developing countries in order to ensure global best practices and its effectiveness in our local environment. The study revealed that the PPA 2007 conforms largely to the international procurement standard, which confirmed Anago's (2011) assertion that the PPA 2007 remained a comprehensive piece of legislation for best practices that can ensure a smooth and transparent procurement process, which will enable probity in spending public funds. However, the study further revealed that the composition of the National Council on Public Procurement should be revised. It was the opinion of those interviewed that the Attorney-General and Minister of Justice, who is a member of the Nigerian Bar

Association (NBA) is sufficient to guide the Council on legal matters. The second legal expert should be replaced with a member of the Nigerian Institute of Quantity Surveyors (a procurement expert in construction works), who will make more impact than two legal experts.

Further on the discourse that centred on the Procurement models and successful construction project delivery, Familoje, Ogunsemi, and **Awodele (2015b)** assessed the challenges facing the effective operations of the Nigeria Public Procurement Act 2007 so that actions could be concentrated on addressing significant challenges to public procurement process to achieve its intended objectives. The paper concluded that procurement studies should be incorporated into the curricula of universities and polytechnics, with a view to elevating public procurement from a clerical function to a strategic discipline. For the Act to succeed the political class should muster enough political will to ensure proper process function.

4.2. Discourse on Construction Risk Management and Stakeholder Management Practices

As earlier mentioned, the construction industry has been plagued by risks which invariably have affected its performance in terms of meeting its goals or stakeholders' expectations. These risks can be managed, minimised, shared, transferred, or accepted but cannot be ignored. The client therefore needs to decide how much risk to accept when choosing the procurement route to be used for their project. In our contribution to the discourse on risk management in construction project, Ogunsemi & **Awodele (2005)**, and Adedokun, Ogunsemi, Aje, **Awodele & Dairo (2013)** investigated various issues relating to risk factors as they affect construction project delivery. We identified price fluctuation, delay in progress payment by clients, clients-initiated variations,

delay in settlement of contractual claims and unforeseen ground conditions as the most significant causes of cost and time overruns in construction projects in Nigeria. We demonstrated that risk should not be treated merely as a threat to be avoided, but as a managerial variable that can be anticipated, analysed, and strategically controlled across the project lifecycle. We argued that for sustainable development, an effective risk management procedure, which consists of risk identification, risk analysis and risk response must be in place in order to achieve value for money.

In providing a better understanding of risk and its management **Awodele *et al.* (2007)** examined the significance of risk factors on the performance of contractors in oil producing areas of Ondo State. The study showed that most projects in the oil producing areas are more prone to cost overrun than time overrun. While political, economic, social and environmental risks in that order were the most significant risk factors affecting cost performance; political, logistic, physical, environmental and social considerations were the most significant time performance factors. The study recommended that the sustainability and performance of existing agencies such as the NDDC and OSOPADEC be strengthened, and that a holistic approach to infrastructure development in the area be pursued. **Awodele, Ogunlana, and Motawa (2010a & 2010b)** in addressing the factors that can impact the outcome of a privately financed market project, revealed that understanding and adequate management of economic, construction, cultural and political risks have much effect on cost, time, quality, and financial performance of the market. Thus, adequate consideration should be given to the risk factors at the inception of such projects to forestall poor performance. Only then can a market development project meet the needs of the present generation without compromising the ability of future generations to meet their needs. In view of

frequent changes in governments, it is also recommended that sufficient mechanism should be in place to ensure that governments honour agreements made with their predecessors. Our effort was also directed to better understanding of risk and its management in tourism development in Nigeria. **Awodele and Ayeni (2011)**, through a sequential mixed-method approach involving a qualitative/quantitative sequence, revealed that shortage of infrastructure; poor market demand; immature financial markets; and lack of competent manpower were among the significant risk factors affecting successful development of tourism in Nigeria. The paper also identified effective mitigation measures for these risk factors. The paper concluded that every stakeholder involved in tourism development projects must be involved in risk management (i.e. in identifying, analysing, developing responses, and controlling risk). Moreover, risk management should also be integrated with the decision-making processes in managing tourism development projects, as risk management reveals the rationales for making appropriate decisions.

In the same vein, **Awodele (2016)** assessed the risk identification and response techniques adopted on building projects in Rivers State, Nigeria with a view to enhancing projects performance in the study area. The study revealed good level of awareness of the existing risk identification and response techniques. It was shown from the study that utilisation of experience, brainstorming and study of project documents were the most used risk identification techniques while the risk transfer, risk reduction and risk sharing were the most utilised response techniques in building projects. The study concluded that stakeholders should visit locations, consult experts, and refer to databases, and historical data from similar projects during risk identification to complement the existing utilised techniques.

Lashinde, Ogunsemi, and **Awodele (2015)** investigated the financial and political risks affecting investors' decisions to participate in PPP projects in Nigeria, drawing on descriptive research involving 34 respondents selected from four concession companies and banks in the Niger Delta region. Findings of the study revealed the need to improve concession companies' credit worthiness, bankability of projects, state of the economy, and to reduce negotiation period to stimulate positive investors' decisions. The study argued that strong and adequate government guarantees to the banks in lieu of conventional insurance practice can provide the needed refinements requisite to promote investors' decision.

Empirical evidence from my assessment of risk in housing projects procured through Public–Private Partnership (PPP) arrangements in Nigeria (**Awodele, 2017**) illustrates the consequences of weak risk management frameworks. The findings revealed that critical risks such as policy inconsistency, financing uncertainty, land acquisition challenges, and construction performance risks were often inadequately identified at project inception. Where risks were identified, they were frequently transferred contractually to private partners without corresponding managerial control or mitigation capacity. This imbalance resulted in project delays, renegotiations, and in some cases, project abandonment. These findings resonate with broader industry observations that inappropriate risk allocation is a principal driver of disputes and performance failure in construction projects. However, my work extends this understanding by demonstrating that risk allocation decisions are fundamentally shaped by procurement choices and institutional capacity. Risk management, therefore, cannot be divorced from procurement strategy, governance arrangements, or stakeholder engagement mechanisms. **Awodele (2018)** contributed to

understanding how risk emerges from procurement choice, showing that risk allocation must be proactive, structured, and linked to contract incentives. The quantity surveyor's ethical and technical mandate uniquely positions them to lead risk identification, allocation, pricing, and mitigation across the project lifecycle, ensuring both economic and social sustainability.

A major contribution to the discourse of risk and its management in construction project is our effort geared towards integrating risk management at the planning stage of any process improvement effort in construction project. **Awodele**, Ogunlana, and Bowles (2012c) argued that business process improvement is a complex, risk prone, collaborative process that requires a set of coordinated risk management processes. We observed that in planning for process improvement though, there are possibilities that certain predictable events might occur, whose exact likelihood and outcomes is uncertain but could potentially affect the objectives in some way, either positively or negatively. Their capacities for affecting objectives explain the need for adequate risk management exercises in planning for process improvement. In the study, risk management was presented as a proactive rather than a reactive, positive rather than negative effort, which seeks to increase the probability of process improvement. The study introduced process improvement and the integration of risk management at the planning stage for process improvement (see Figure 10). The study further emphasised that effective risk management enhances not only cost and time performance but also organisational learning and continuous improvement within construction firms.

From a quantity surveying perspective, risk management represents a core professional function rather than an auxiliary task. Quantity surveyors possess specialised competence in cost

forecasting, contingency planning, contract administration, and value analysis skills that are directly relevant to risk identification, quantification, allocation, and mitigation. My studies suggested that when quantity surveyors are involved early in project conception, risk allowances are more realistic, contingencies are better justified, and value-for-money outcomes are enhanced. Furthermore, my research on information technology adoption in quantity surveying practice, Ibironke, Ekundayo and **Awodele (2011)** indicated that digital tools can significantly strengthen risk management capability by improving cost data accuracy, scenario analysis, and transparency. However, as the study revealed, the benefits of such tools are maximised only when embedded within an integrated risk management culture rather than used as isolated technical solutions.

In the area of stakeholder management, my scholarly and professional engagement with construction stakeholders has consistently demonstrated that stakeholder-related challenges are among the most underappreciated causes of construction project underperformance. A study I co-authored on information technology adoption in quantity surveying service delivery (Ibironke, Ekundayo and **Awodele 2011**) sheds light on stakeholder expectations around technology use and service quality. The findings demonstrate that professional responsiveness, accuracy, and transparency are essential to meeting the needs of clients and host communities. Importantly, the study also found that stakeholders increasingly expect higher levels of transparency, accountability, and technological competence from construction professionals. While digital tools

were shown to enhance information flow, reduce information asymmetry, and support trust-building among project participants, the study equally revealed that technology alone cannot substitute for deliberate stakeholder engagement strategies. Rather, digital tools must be integrated within a broader governance and communication framework if their full potential is to be realised.

Similarly, a study I led on stakeholder management in privately financed market projects in Nigeria (**Awodele, Ogunlana, and Motawa 2011**) revealed that many project delays, disputes, and cost escalations were rooted not in technical failures but in inadequate stakeholder identification, poor communication strategies, and weak participatory mechanisms. The research highlighted those projects with early and continuous stakeholder engagement exhibited greater legitimacy, smoother implementation, and improved performance outcomes. The findings from this work underscore the limitations of traditional procurement and management approaches that prioritise contractual compliance over relational governance. In privately financed and PPP-type arrangements, stakeholder expectations extend beyond cost and time to include transparency, fairness, social impact, and long-term service delivery. Failure to address these expectations often manifests as resistance from host communities, political interference, and reputational risks for project sponsors.

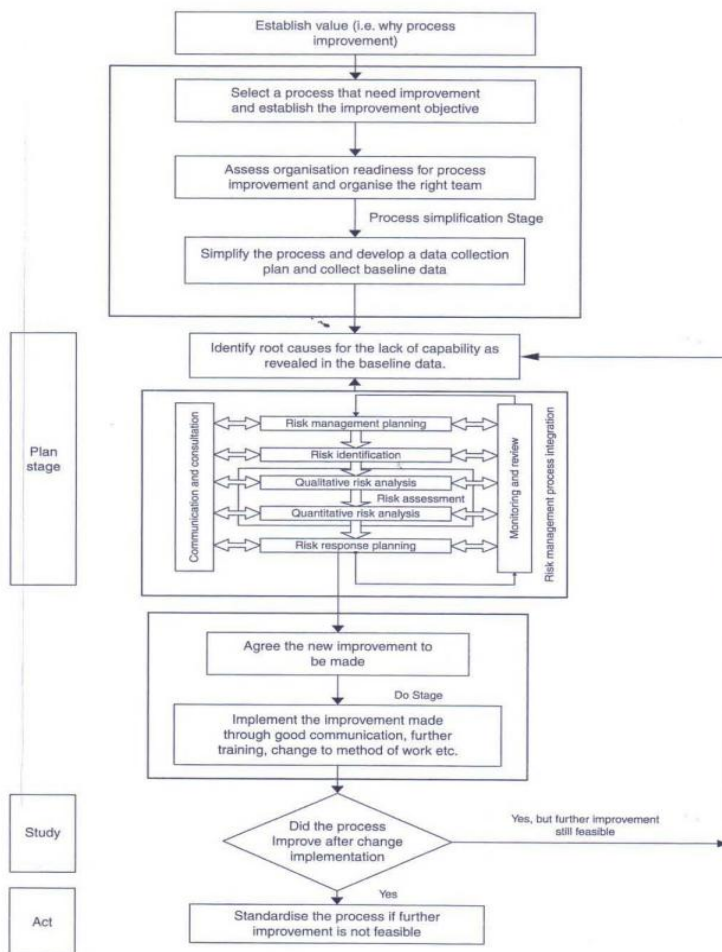


Figure 10: Risk management integration in planning for process improvement

Furthermore, Lashinde, Ogunsemi, and **Awodele (2016)** focused on the key concepts underlying stakeholder involvement and the criteria to measure their satisfaction level with the PPP

infrastructure projects in Niger-Delta region of Nigeria. The study revealed that there is divergent opinion among stakeholders regarding what constitute stakeholders' satisfaction. The study recommended that confidence-building measure through establishment of forum between the private and public sectors and end users to discuss economic impact and social value of the infrastructure projects for growth, determination of the priority of the infrastructure projects and the challenges be put in place to eradicate future conflict.

Also, Ajiferuke, **Awodele**, and Adegbembo (2017) examined the management of relationship among construction stakeholders in Osun State, and the challenges of managing these stakeholders. The objectives were assessing the level of stakeholder management practice and evaluating the challenges of stakeholder management practice in construction project delivery. It was revealed that identification of a clear mission for the project was considered the highest activity of stakeholder management. Financial constraint on the project was the most significant challenge; lack of communication and lack of appropriate motivational tool were also other significant challenges facing stakeholder management in the construction industry in Osun State. The study established that adequate practice of stakeholder management will ensure timely project completion.

4.3 Discourse on Sustainable Construction and Infrastructural Development

Sustainable construction and infrastructural development refer to the planning, design, construction, operation, and maintenance of building and infrastructure in ways that promote environmental protection, economic growth, and social well-being without compromising the ability of future generations to meet their own

needs. The concept is rooted in the principle of sustainable development popularised by the United Nations through the Brundtland Report of 1987. In recent years, sustainability has become a major concern globally due to climate change, rapid urbanisation, environmental degradation, depletion of natural resources, and increasing population growth. The Construction industry, being one of the largest consumers of natural resources and energy, occupies a central position in achieving sustainability goals. While these dimensions are critical, my research and professional experience suggest that sustainable construction is fundamentally an **integration challenge**, one that requires the alignment of procurement models, risk management practices, and stakeholders' expectations. Olanipekun, Aje, and **Awodele, (2014)** in formalising and contextualising sustainable infrastructural development in Nigeria revealed the state of infrastructure development and approaches that are strategic to the development of sustainable infrastructure in Nigeria. The suggested approaches were grounded on global best practice and made to reflect the peculiarity of the contemporary Nigerian environment. The study advocated for a more committed government effort and an inclusive civil society participation in sustainable infrastructure development in Nigeria.

From an economic standpoint, sustainability demands affordability, value-for-money, and life-cycle efficiency rather than short-term cost minimisation. My studies on procurement systems, particularly labour-only procurement, and PPP housing delivery (**Awodele, 2018**), revealed that projects procured without adequate consideration of long-term risk exposure and operational performance often appear cost-effective at inception but become economically unsustainable over time. These findings reinforced the importance of life cycle costing and whole-life value assessment as essential tools for sustainable construction decision-making. Furthermore, **Awodele, Aghimien,**

Akinkunmi, and Aigbavboa (2019) assessed the capability of the labour-only procurement system as a survival strategy for construction contractors in a challenging economy. The paper concluded that participants were willing to execute more projects through this system because it offered considerable cost savings for clients, reduced the contractor's risk and allowed them to maintain healthy cash flow. The main factors influencing its usage were the client's decision to procure materials needed for job at hand for contractors and the need for referrals from clients for subsequent jobs.

Environmental sustainability, though increasingly emphasised in policy discourse, remains weakly institutionalised in many developing-country construction contexts. A study I co-authored on sustainable construction materials in Southwest Nigeria (Aghimien, Awodele, and Aghimien, 2016) provided empirical evidence that the adoption of sustainable materials is significantly influenced by professional advice, cost perceptions, and regulatory enforcement. The study demonstrated that quantity surveyors play a decisive role in shaping material selection through cost planning, specification advice, and value analysis. Where QS professionals actively engaged sustainability considerations, projects were more likely to incorporate locally sourced, environmentally responsible materials.

Social sustainability represents a further, often overlooked, dimension of sustainable construction. It encompasses issues of safety, inclusiveness, community impact, ethical procurement, and stakeholder trust. Insights from my earlier work on stakeholder management in privately financed projects (Awodele, *et al.*, 2011) show that neglecting social considerations frequently leads to community resistance, disputes, and reputational damage, all of which undermine project sustainability. Sustainable construction therefore requires

deliberate engagement with stakeholders to secure social licence and long-term legitimacy. Importantly, sustainability objectives introduce new forms of risk — technical, financial, regulatory, and social— which must be anticipated and managed. My research on risk management in PPP housing projects highlights that sustainability risks are often poorly allocated and insufficiently priced, leading to performance shortfalls. This finding further underscores the inseparability of sustainability and risk management in construction projects.

4.4 Expanded Role of Quantity Surveyors in Policy and Development Processes.

Quantity Surveying firms are knowledge-intensive organisations that provide expert advice and professional knowledge to clients (Løwendahl, 2000) and the ability of QS to meet changing client needs and grow the market for professional services depends on the knowledge base of the profession (Babalola, Ojo, Bello, Adafin and Musa, 2011). Knowledge is the main contributor to the surveyor's portfolio, so, effective Knowledge Management (KM) skills can help to improve their expertise (Davis, Watson and Man, 2007). To survive and grow in the future, the QS profession must respond quickly and creatively to the challenges of accelerating social, technological, economic and environmental change (Davis et al, 2007).

Awodele et al. (2007) contributed to the global discourse on the evolving roles of quantity surveyors in Nigeria by evaluating the competencies of practitioners in the country. The study examined the performance and professional contributions of quantity Surveyors across three competency stages: those currently demonstrated, those immediately required, and those essential for meeting future industry challenges. It further assessed their contributions in both pre-contract and post-contract service

delivery. The findings revealed that while core competencies in quantity surveying practice were generally exhibited, there remained a significant need to strengthen management and communication-oriented competencies for both current and future application in the Nigerian construction industry. The study concluded that these competencies should be embedded in the curricula for trainee Quantity Surveyors, and that the Nigerian Institute of Quantity Surveyors should incorporate them as focal themes in its professional development seminars.

Further to this, Aje & **Awodele, (2006)** in a study on the ethical values of quantity surveyors in Nigeria evaluated the ethical standards of quantity surveyors in the Nigerian construction industry. The study asserted that ethical standards of quantity surveyors have declined in the areas of professional obligation, responsibility, loyalty, integrity, and honesty. The study identified the critical areas where quantity surveyors have been involved in ethical misconduct like inflating quantities in bills of quantities, revealing official secrets, colluding with contractors and demonstrating professional incompetence. It was suggested that quantity surveyors should be well trained to perform their roles effectively in all areas of construction projects by reviewing the present curricula in all higher institutions of learning through the involvement of education committee of the Nigerian Institute of Quantity Surveyors while members of the profession caught in any act of professional misconduct should be sanctioned accordingly.

Lack of knowledge sharing has proved to be a major barrier to the effective management of knowledge in organisations (Davenport and Prusak, 1998). Based on this reason, knowledge sharing is viewed as a main driver for QS firms to be competitive (Nor and Egbu, 2010). In a study I co-authored on the assessment

Knowledge Management (KM) practices in QS firms with a view to establishing the state of art of KM practice in QS firms in Lagos and Abuja (Adegbembo **Awodele**, and Ogunsemi **2015**). the study revealed that knowledge acquisition has a positive influence on knowledge creation, storage, sharing, utilisation and maintenance. The study further revealed that quantity surveying firms have a high level of awareness of KM and out of all KM activities that are regularly undertaken in QS firms, knowledge maintenance was still lacking. In the same vein, Akinola, Ogunsemi, and **Awodele, (2016)** assessed the Relatedness of Quantity Surveyor's Skill Requirements for Diversification of Practice Firms in Nigeria. The study focused on measuring the relatedness of quantity surveyors' skill requirements for diversification of professional services. We demonstrated in the study that quantity surveying firms in Nigeria diversified in the areas of arbitration and other dispute resolution; project management and other business development related to core competence and concluded that business opportunities abound in the areas of taxation, insolvency valuation; insurance and property investment.

Empirical work on PPP housing projects (**Awodele, 2018**) reinforced these responsibilities, demonstrating that early risk identification, realistic pricing, and alignment with stakeholders' expectations are critical to avoiding disputes and achieving sustainable outcomes. The quantity surveyor's contribution at this early stage is therefore not merely technical but strategic, linking procurement decisions directly to risk governance and long-term project performance. My research consistently demonstrates that inappropriate risk allocation is a major cause of project underperformance. In PPP housing projects, risks were frequently transferred based on contractual convenience rather than managerial competence (**Awodele, 2018**). The quantity surveyor's role, therefore, should extends beyond measurement

to advising on procurement selection, pricing risk realistically, and safeguarding long-term value.

Furthermore, value in construction is no longer defined solely by lowest initial cost. Public clients demand accountability; communities demand social benefits; end users demand functionality and safety; governments demand sustainability compliance. Findings from **Awodele, et al., (2011)** demonstrated that stakeholder expectations extend to technology adoption, timeliness, transparency, and quality, showing that Qs must integrate stakeholder insights into value definitions. Lifecycle costing and whole-life risk assessment become critical tools for balancing these expectations. The contemporary understanding of project value transcends lowest initial cost. Value is increasingly defined in terms of whole-life performance, user satisfaction, environmental impact, and social legitimacy. Public-sector clients demand accountability; communities expect social benefits; end-users prioritise functionality and safety.

Evidence from our study on IT adoption in quantity surveying practice (Ibironke, Ekundayo and **Awodele 2011**) revealed that stakeholders increasingly expect efficiency, transparency, and technological competence from professionals. These expectations necessitate a redefinition of value metrics to include life-cycle costing, risk-adjusted performance, and stakeholder-informed benchmarks.

5.0 CONCLUDING REMARKS AND RECOMMENDATIONS

Madam Vice-Chancellor, distinguished ladies and gentlemen, this inaugural lecture has examined the persistent performance challenges of the construction industry through the lens of integration. It has argued that sustainable construction cannot be

achieved through isolated reforms in procurement systems, risk management practices, or stakeholder engagement strategies. Rather, sustainability emerges as the outcome of deliberate, informed, and coordinated integration across these domains.

Drawing on my research contributions so far, in this lecture, I advance the position that sustainable construction is not an additional project requirement but the **outcome of effective integration**. Procurement models must be selected to support collaboration and long-term value; risks must be managed proactively across the life cycle; and stakeholder expectations must inform value definition and performance evaluation. Within this integrated framework, the Quantity Surveyor emerges as a central actor—bridging economic, environmental, and social considerations to deliver construction projects that are resilient, responsible, and sustainable.

Every procurement system implicitly allocates risk, embedding assumptions about risk ownership and control that shape project outcomes from the outset. Traditional procurement transfers design risk to consultants and construction risk to contractors, an arrangement that frequently generates claims and disputes. Design and Build consolidates these responsibilities under a single contractor, which can improve accountability but may reduce design quality and transparency if not properly managed. PPP arrangements redistribute financial and operational risks to the private sector, but demand sophisticated value-for-money and affordability assessments to ensure that the allocation is both equitable and sustainable.

Within this landscape, the quantity surveyor's role is to:

- advise on procurement selection based on risk profile;
- ensure equitable risk allocation;

- price risk realistically in cost plans and contract documentation; and
- safeguard the client's long-term value interest.

This lecture has demonstrated the strategic and evolving role of the quantity surveyor as an integrator of value. By embracing this expanded role, quantity surveyors can contribute meaningfully to economic efficiency, environmental responsibility, and social legitimacy in construction project delivery. I conclude by challenging practitioners, policymakers, educators, and students to rethink how construction projects are conceived, procured, and delivered. Integration, collaboration, ethical leadership, and research-informed practice must define the future of the construction industry if it is to meet the demands of sustainable development and societal well-being.

Based on the foregoing, the following recommendations are proposed:

- i. Quantity Surveying practice must evolve in response to the increasing complexity and sustainability demands of construction projects. The traditional perception of the quantity surveyor as primarily a cost measurer is no longer adequate. Instead, the contemporary quantity surveyor must operate as a construction economist, procurement strategist, risk adviser, and sustainability champion.
- ii. Evidence from my studies demonstrates that when quantity surveyors contribute to procurement appraisal, risk workshops, and value management exercises at early stages, projects benefit from more realistic cost forecasts, equitable risk allocation, and improved stakeholder confidence. Therefore, quantity

- surveyors should be involved early and substantively in project conception and procurement selection.
- iii. Furthermore, quantity surveyors must develop competence in life-cycle costing, sustainability assessment, and digital tools to remain relevant in an evolving industry.
 - iv. Proper awareness of both the public and private sector of the inherent risks in PPP procurement system is necessary and this can be done through seminars, conferences and workshops organised by various construction professional bodies and procurement units across the country.
 - v. At the policy level, public procurement policies must move beyond compliance to performance. Sustainability criteria should be embedded in procurement evaluation, and risk-informed procurement guidelines should be institutionalised as empirical findings from my work show that poorly allocated risks in PPP projects can undermine national development objectives.
 - vi. As a cost and procurement expert on construction projects, quantity surveyors should be included on the Board of the National Council on Public Procurement.
 - vii. Stakeholder conflicts are a major cause of project delays in Nigeria. Mandatory stakeholder analysis and engagement plans should be incorporated into Environmental Impact Assessments (EIA Act, Cap E12 LFN 2004).
 - viii. Risk management is not yet a statutory requirement in most Nigerian projects. The Bureau for Public Procurement (BPP) should mandate risk management plans as part of project approval and tender documentation.

- ix. The establishment of centres of excellence in sustainable construction within Nigerian universities is strongly advocated, to drive research, professional development, and knowledge transfer in this critical area.
- x. The establishment of a National Construction Industry Development Council (NCIDC), long advocated but not yet fully operationalised, is recommended to harmonise policies, drive innovation, and monitor industry performance.
- xi. Universities and professional training institutions, including the Federal University of Technology, Akure, must reposition their quantity surveying curricula beyond technical measurement to encompass integrated project delivery, risk analytics, sustainability economics, stakeholder management, and digital innovation.
- xii. Finally, embedding research-led teaching, informed by empirical studies such as those presented in this lecture, will better equip graduates for contemporary professional challenges.

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