

ПОДОБРЯВАНЕ НА ЕФЕКТИВНОСТТА ПРИ ИЗПЪЛНЕНИЕТО НА ПРОЕКТИ ЗА РАЗВИТИЕ НА ПУБЛИЧНАТА ИНФРАСТРУКТУРА В НИГЕРИЯ: БАРИЕРИ И ИНОВАТИВНИ РЕШЕНИЯ ПРИ ПУБЛИЧНИТЕ СТРОИТЕЛНО-ИНЖЕНЕРНИ ПРОЕКТИ В НИГЕРИЯ

Осагие Годфри Ониго

IMPROVING PROJECT DELIVERY EXCELLENCE IN NIGERIAN PUBLIC INFRASTRUCTURE DEVELOPMENT: BARRIERS AND INNOVATIVE SOLUTIONS FOR PUBLIC CIVIL ENGINEERING PROJECTS IN NIGERIA

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Abstract:

Civil engineering projects play a vital role in national development by providing essential infrastructure such as roads, bridges, housing, drainage systems, water supply networks, and transportation facilities. In Nigeria, public infrastructure projects are critical for economic growth, urban development, industrial expansion, and improving the quality of life of citizens.

Despite their importance, many public civil engineering projects experience delays, cost overruns, poor workmanship, contract disputes, and project abandonment. These challenges reduce project delivery efficiency and undermine public confidence in government institutions. This study examines the major barriers affecting project delivery in Nigeria and proposes practical strategies for improving project delivery efficiency through better governance, modern project management practices, digital construction technologies, and stakeholder collaboration.

Keywords:

Civil engineering; Nigeria; project delivery; project management; building information modelling (BIM); construction management; sustainable infrastructure.

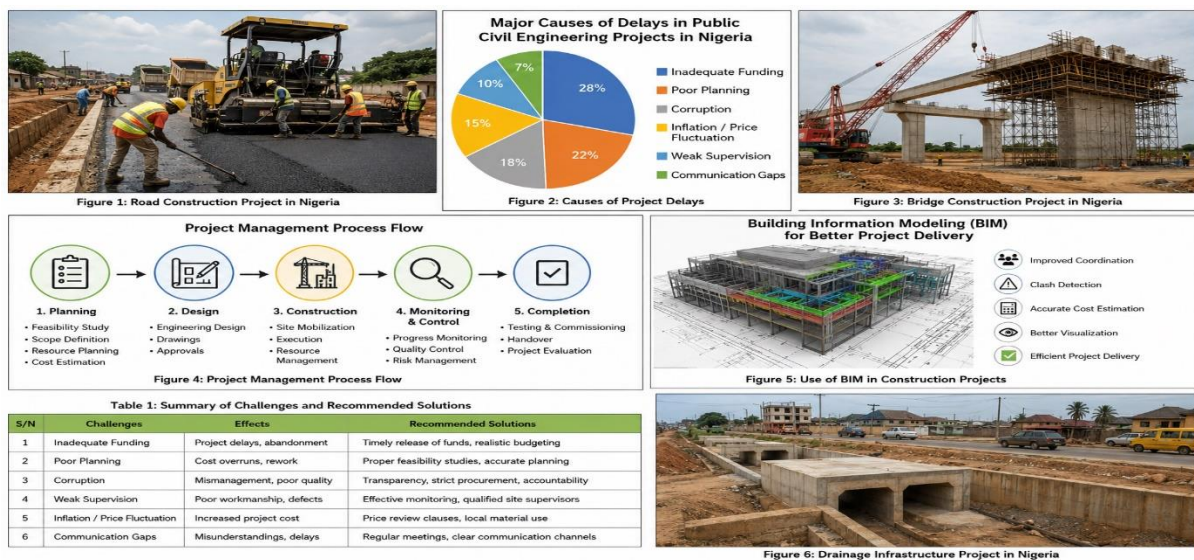
1. INTRODUCTION

Civil engineering projects play a fundamental role in promoting national development through the provision of roads, bridges, housing, drainage systems, water supply systems, and transportation infrastructure. In Nigeria, public infrastructure projects are important for economic growth, urban development, industrial expansion, and improving the standard of living of the people. Despite the importance of infrastructure development, many public civil engineering projects in Nigeria still face serious challenges such as delays, cost overruns, poor workmanship, contract disputes, and project abandonment. These problems reduce the efficiency of project delivery and negatively affect economic productivity and public trust in government institutions. Project delivery efficiency is the ability to complete projects within the approved scope, budget, timeline, and quality standards. Efficient project delivery ensures proper utilization of public funds and promotes sustainable infrastructure development.

Literature analysis: Recent studies identify project delays, cost overruns, inadequate financing, weak governance, and ineffective project management as major factors affecting construction project delivery in Nigeria. Adamu and Idris (2024) reported that financing constraints significantly contribute to project delays, while Iroha et al. (2024) highlighted the underutilization of professional project management practices within the Nigerian construction industry. Nnadi and Najjobyo (2025) further identified inaccurate cost estimation, material price volatility, and delayed payments as major contributors to poor project performance.

Figure 1 illustrates the major factors responsible for delays in Nigeria public infrastructure projects identified from the reviewed literature.

Figure 1. Major Factors Responsible for Delays in Nigerian Public Infrastructure Projects



2. RESEARCH METHODOLOGY

This study adopts a qualitative research methodology based on secondary data sources. Information was obtained from academic journals, government publications, project management reports, and previous studies related to public construction projects in Nigeria and other developing countries. The qualitative literature analysis approach was selected because it enables a comprehensive assessment of existing project delivery challenges and the identification of practical management strategies for the Nigerian construction environment

3. SOME OF THE CHALLENGES IN NIGERIAN PUBLIC CONSTRUCTION PROJECTS

Figure 2 illustrates the primary causes of project delays in Nigeria public infrastructure projects discussed in this study.

Figure 2. Primary causes of project delays in Nigerian Public Infrastructure Projects



4. Project Delays

Project delays are among the most common challenges in Nigerian public infrastructure projects. Delays often arise from poor planning, delayed approvals, inconsistent funding, and poor contractor performance.

4.1 Cost Overruns

Many projects exceed their original budgets due to inflation, fluctuating material prices, inaccurate cost estimation, corruption, and changes in project scope during execution.

4.2 Poor Supervision and Quality Control

Weak supervision and ineffective quality assurance systems allow poor workmanship and substandard construction practices to continue during project implementation.

4.3 Shortage of Skilled Manpower

The shortage of experienced engineers, project managers, and technical personnel reduces productivity and compromises construction quality.

4.4 Corruption and Political Interference

Corruption within procurement systems and political interference in contractor selection processes often result in the appointment of incompetent contractors and mismanagement of public funds. Building Information Modelling (BIM), project management software, and digital monitoring systems improve coordination, communication, and project documentation.

5. Role of Project Management

Techniques Modern project management techniques can significantly improve project delivery efficiency in Nigeria.

5.1 Risk Management

Early identification and assessment of risks enable project teams to develop mitigation strategies before problems become severe.

5.2 Digital Construction

Technologies such as Building Information Modelling (BIM), project management software, and digital monitoring systems improve coordination, communication, and project documentation.

5.3 Stakeholder Engagement

Active collaboration among government agencies, contractors, consultants, and host communities improves transparency and reduces conflicts.

5.4 Capacity Building

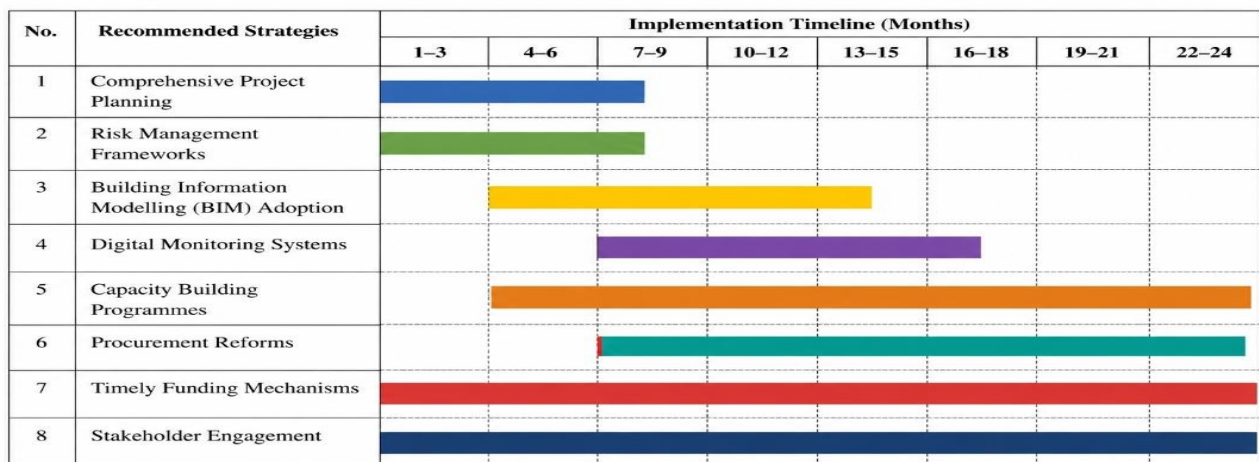
Continuous training and professional development improve the competence of engineers, supervisors, and project managers.

6. Recommended Strategies for Improving Project Delivery

Table 1. Recommended Strategies for Improving Project Delivery

Strategy	Expected Benefits
Comprehensive Project Planning	Improved budgeting and scheduling accuracy
Risk Management Frameworks	Early identification and mitigation of project risks
Building Information Modelling (BIM) Adoption	Better project coordination and visualization
Digital Monitoring Systems	Improved transparency and performance tracking
Capacity Building Programmes	Enhanced technical competence of engineers and project managers
Procurement Reforms	Reduced corruption and improved accountability
Timely Funding Mechanisms	Improved project continuity and reduced delays
Stakeholder Engagement	Reduced conflicts and improved collaboration

6.1 Proper Scheduling and Planning



Note: [Blue bar] Duration of Strategy Implementation

The use of Gantt charts, Critical Path Method (CPM), and work breakdown structures (WBS) improves project monitoring and resource allocation.

7. Discussion

The findings of this study reveal that inefficiency in public civil engineering project delivery in Nigeria is a multidimensional problem influenced by technical, financial, administrative, institutional, and political factors. While project delays and cost overruns are common challenges in many developing countries, the Nigerian construction sector faces additional difficulties associated with weak governance structures, inconsistent policy implementation, inadequate professional supervision, and limited adoption of modern construction technologies.

One major issue identified is inadequate project planning during the early stages of project development. Many public infrastructure projects are initiated without comprehensive feasibility studies, realistic budgeting, or proper risk analysis. As a result, contractors and project managers frequently encounter unforeseen technical and financial problems during project execution. Weak planning also contributes to inaccurate cost estimation and unrealistic project schedules, thereby increasing the likelihood of delays and budget escalation.

The study further shows that irregular funding and delayed release of government allocations significantly affect project continuity. In many cases, contractors are unable to maintain steady construction activities because of delayed payments, leading to reduced productivity, project abandonment, and disputes among stakeholders. Inflation and unstable economic conditions in Nigeria also contribute to rising construction costs, especially in projects that rely heavily on imported materials, fuel, and equipment.

Corruption and political interference remain critical obstacles to effective project delivery. The appointment of unqualified contractors through politically motivated procurement processes reduces the quality of construction work and weakens accountability within public infrastructure projects. Inadequate monitoring and weak enforcement of construction standards further allow poor workmanship and misuse of public resources to continue without proper sanctions.

Another important finding is the shortage of skilled technical manpower within the Nigerian construction industry. The limited availability of experienced project managers, engineers, quantity surveyors, and site supervisors affects productivity, coordination, and quality assurance during project implementation. Continuous professional training and capacity development are therefore essential for improving technical competence and project management performance.

The study also highlights the growing importance of digital technologies and modern project management systems in improving construction efficiency. Tools such as Building Information Modelling (BIM), project scheduling software, digital monitoring systems, and automated reporting platforms can significantly improve communication, transparency, coordination, and decision-making among project stakeholders. The adoption of these technologies can reduce human errors, improve documentation accuracy, and enhance project monitoring throughout the construction lifecycle.

Furthermore, stakeholder engagement and institutional collaboration play a significant role in successful project delivery. Effective communication among government agencies, contractors, consultants, regulatory bodies, and local communities can minimize conflicts, improve transparency, and support faster decision-making. Projects that involve proper stakeholder participation are more likely to achieve better implementation outcomes and long-term sustainability.

Overall, the discussion demonstrates that improving project delivery efficiency in Nigeria requires not only technical solutions but also broader institutional reforms, transparent governance systems, stronger professional standards, and increased investment in project management capacity. Sustainable infrastructure development can only be achieved when project execution processes are supported by accountability, effective leadership, proper funding mechanisms, and modern construction management practices.

8. Conclusion

Public civil engineering projects remain fundamental to Nigeria's economic growth, urban development, transportation improvement, and overall national infrastructure expansion. However, persistent inefficiencies in project delivery continue to hinder the successful completion of many government-funded infrastructure projects across the country. Delays, cost overruns, poor supervision, abandoned projects, and substandard construction practices have negatively affected public confidence and reduced the effectiveness of infrastructure investment programs.

This study examined the major causes of inefficiency in Nigerian public civil engineering projects and identified several critical factors responsible for poor project performance. These include inadequate project planning, weak monitoring systems, corruption, delayed funding, inflation, shortage of skilled manpower, poor communication among stakeholders, and political interference in procurement and project execution processes.

The study further established that modern project management techniques and digital construction technologies can significantly improve project delivery efficiency when properly implemented. Effective scheduling systems, risk management strategies, stakeholder engagement frameworks, Building Information Modelling (BIM), and digital monitoring tools can improve coordination, transparency, accountability, and overall project performance. In addition, strengthening institutional governance and enforcing professional standards are necessary for reducing corruption and ensuring quality infrastructure delivery.

The research emphasizes that sustainable improvement in public construction project delivery requires a combination of technical innovation, administrative reform, financial discipline, and professional competence. Government agencies must prioritize transparent procurement systems, effective supervision, timely release of project funds, and continuous training of engineering professionals. Construction stakeholders should also adopt integrated project management approaches that encourage collaboration, accountability, and efficient resource utilization.

In conclusion, improving project delivery efficiency in Nigeria is essential for achieving sustainable national development and maximizing the socioeconomic benefits of public infrastructure investment. The successful implementation of the recommendations presented in this study will contribute to reduced project failures, improved infrastructure quality, enhanced public trust, and stronger long-term economic development within the Nigerian construction sector.

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