

A Critical Analysis of Causes and Effects of Delays in Nigeria's National Integrated Power Projects (NIPP)

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Abstract

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This study critically analyzes the causes and effects of delays in Nigeria's National Integrated Power Projects (NIPP), focusing on the factors contributing to time overruns and their impact on project delivery. Utilizing a descriptive quantitative research design, primary data were collected through questionnaires and interviews with professionals involved in NIPP projects, while secondary data was sourced from relevant literature. The study identifies key delay factors, including political interference, poor feasibility studies, payment delays, and consultant inefficiencies, using the Relative Importance Index (RII) method. The findings reveal that client-related and consultant-related factors significantly contribute to delays, exacerbating Nigeria's ongoing power crisis and hindering economic growth. Policy recommendations include improving project governance, strengthening planning processes, streamlining financial management, and enhancing stakeholder collaboration. These measures aim to address the root causes of delays and ensure timely completion of future infrastructure projects, supporting sustainable national development.

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1. Introduction

The construction industry plays a vital role in national development by providing the infrastructure needed to support economic growth and social well-being. In developing countries like Nigeria, the significance of the construction sector is even more pronounced, as it serves as a catalyst for industrialization, urbanization, and enhanced public services. However, the industry is plagued by numerous challenges, with project delays being one of the most critical issues. Project delays disrupt timelines, inflate costs, and undermine the anticipated benefits of infrastructure developments, creating ripple effects across the economy. These delays are particularly acute in large-scale, complex projects such as the National Integrated Power Projects (NIPP) in Nigeria.

Initiated in 2005 as an emergency intervention to bolster the country's power grid, the NIPP was conceived to address Nigeria's long-standing power generation deficits and unreliable electricity supply. The project encompasses power generation, transmission, and distribution infrastructure, which are critical to meeting the country's energy demands. Despite its ambitious scope and

potential to transform Nigeria's electricity landscape, the NIPP has faced substantial delays, severely limiting its effectiveness and ability to meet its objectives. As of 2013, many components of the NIPP were still incomplete, several years behind their originally scheduled completion dates. These delays have continued well beyond their initial timelines, with numerous projects still pending as of 2024, contributing to Nigeria's enduring electricity crisis (Eberhard, Gratwick, Morella & Antmann, 2017).

Delay in construction projects is typically defined as a time overrun beyond the completion date specified in a contract or agreed upon by the involved parties for project delivery (Ogunlana, Promkuntong & Jearkjirm, 1996). In the case of NIPP, delays have exceeded five years in several projects, a substantial deviation from the intended schedule of 24 months for project completion. These delays can arise from a variety of sources, including financial constraints, poor site management, and inadequate project planning. External factors such as political interference, bureaucratic inefficiencies, and land acquisition disputes also play a significant role (Omoregie & Radford, 2006). The impact of such delays extends far beyond the immediate construction process, with consequences that include cost overruns, contract disputes, litigation, and in some cases, total project abandonment (Aibinu & Jagboro, 2002).

From a business perspective, the delays in NIPP projects have had detrimental effects on both the public and private sectors. Inadequate power supply remains a major impediment to business operations in Nigeria, particularly for energy-intensive industries such as manufacturing and logistics. As power shortages persist, companies are forced to rely on costly alternative energy sources such as diesel generators, which significantly increase operational expenses and reduce profit margins (Oyewobi, Ibranke, Ganiyu & Ola-Awo, 2011). Small and medium-sized enterprises (SMEs), which form the backbone of Nigeria's economy, are disproportionately affected by unreliable electricity, facing both higher costs and operational inefficiencies. These challenges undermine the business environment, deter foreign direct investment (FDI), and limit economic growth (International Energy Agency, 2020).

In addition to the economic toll, project delays in critical infrastructure such as power generation also have far-reaching social impacts. The prolonged delays in completing NIPP projects have exacerbated Nigeria's electricity supply crisis, with only a fraction of the population having access to stable, affordable power (Sovacool et al., 2014). This situation has implications for the broader economy, as inadequate power infrastructure limits industrial output, increases production costs, and stifles economic diversification efforts. Furthermore, unreliable electricity supply hinders the provision of essential public services, including healthcare, education, and water supply, further contributing to Nigeria's developmental challenges (World Bank, 2020).

From a policy perspective, effective governance and regulatory frameworks are essential for mitigating delays in large-scale infrastructure projects like the NIPP. Delays are often exacerbated by weak project management practices, insufficient oversight, and a lack of accountability in the implementation of government projects. Policy reforms aimed at streamlining the approval processes, improving transparency in contract awards, and enforcing penalties for non-performance are crucial to ensuring the timely completion of future infrastructure projects (Sambasivan & Soon, 2007). Strengthening public-private partnerships (PPPs) can also play a vital role in mitigating risks associated with project delays, ensuring that both public and private sector interests are aligned toward achieving project milestones on time and within budget (Gilbert & Sovacool, 2019). Countries such as Brazil and India, which have successfully navigated similar infrastructure challenges, provide valuable lessons for Nigeria in terms of governance, project management, and stakeholder coordination.

The consequences of delays in the NIPP are far-reaching, often resulting in financial losses, increased operational costs, and reduced investor confidence in Nigeria's infrastructure sector (Sovacool et al., 2014). These delays also affect the country's international standing, as foreign investors often view project inefficiencies as indicative of a broader governance and regulatory failure. As such, addressing the delays in the NIPP and similar projects is not just a matter of technical efficiency but is essential for restoring investor confidence and fostering economic development.

By identifying the primary factors contributing to these delays, assessing their impacts, and proposing viable mitigation strategies, this research aims to provide critical insights for future power infrastructure projects in Nigeria and beyond. The findings of this study will be invaluable to

construction professionals, policymakers, and investors in understanding and addressing the challenges of project delays in the context of large-scale power infrastructure development. For policymakers, the focus must be on creating an enabling environment that fosters timely project completion through regulatory reforms and enhanced oversight mechanisms. For industry leaders, there is a need to advocate for improved stakeholder coordination and more robust risk management strategies to minimize the adverse effects of delays on business operations.

This study aims to address two critical research questions:

1. What are the causes of delays in the National Integrated Power Projects in Nigeria, and what is the extent of contribution of delay-factors to untimely delivery of NIPP?
2. What are the effects of delays on the National Integrated Power Projects?

In line with these questions, the primary objectives of this research are:

1. To identify the causes of delays of Nigerian National Integrated Power Projects and to determine the extent of their contributions to late delivery of NIPP.
2. To identify the effects of delays on the National Integrated Power Projects.

By focusing on these questions and objectives, this study seeks to conduct a comprehensive analysis of the causes and effects of delays in the NIPP. The findings will provide valuable insights for construction professionals, policymakers, and investors in understanding and addressing the challenges of project delays in the context of large-scale power infrastructure development in Nigeria and similar contexts globally.

2. Literature Review

2.1 Overview of Theories

Understanding the complexities of delays in large-scale infrastructure projects such as the National Integrated Power Project (NIPP) in Nigeria requires a robust theoretical framework. Three foundational theories—Project Management Theory (specifically the Critical Path Method), Risk Management Theory (through the Probability and Impact Matrix), and Systems Theory—provide essential tools for analyzing the causes and effects of delays, as well as identifying effective mitigation strategies. Together, these theories offer comprehensive insights into managing the intricacies of delay-prone projects like NIPP, where multiple stakeholders, dependencies, and risk factors intersect.

- Project Management Theory - Critical Path Method (CPM)

The Critical Path Method is a fundamental project management technique used to schedule project activities. It was developed in the late 1950s by Morgan R. Walker and James E. Kelley Jr. (Kelley & Walker, 1959). CPM identifies the longest stretch of dependent activities and measures the time required to complete them from start to finish.

In the context of NIPP, CPM is crucial for understanding how delays in certain activities can impact the overall project timeline. For instance, delays in land acquisition or equipment procurement, which are likely on the critical path, can significantly impact the entire project schedule. By applying CPM to NIPP projects, researchers can identify which activities are most critical to timely completion and where delays are likely to have the most

significant impact. This can help in prioritizing resources and management attention to prevent or mitigate delays.

- **Risk Management Theory - Probability and Impact Matrix**

- The Probability and Impact Matrix is a core tool in project risk management, providing a structured approach to evaluating risks based on their likelihood of occurrence and the severity of their impact on project objectives. Originally introduced by the Project Management Institute (PMI, 2017), this matrix helps project managers categorize risks and determine where to focus their mitigation efforts. For large infrastructure projects like NIPP, the Probability and Impact Matrix is particularly useful for identifying the risks most likely to lead to delays. Political instability, funding constraints, contractor inefficiencies, and technical challenges are some of the high-probability risks that could significantly derail project timelines. By categorizing these risks, the matrix enables project managers to develop tailored mitigation strategies. For example, risks related to political instability—such as changes in government policy or delays in obtaining approvals—can be mitigated by engaging in proactive stakeholder management and maintaining contingency plans for administrative hold-ups (Aje et al., 2019). In the case of NIPP, the Probability and Impact Matrix can also guide resource allocation. High-probability, high-impact risks, such as delays in securing financing, should receive immediate attention, with dedicated teams assigned to monitor and manage these risks. Lower-priority risks can be managed with less urgency, allowing project managers to focus their limited resources on the most critical issues. This tool is essential in complex projects like NIPP, where the scale of operations often creates numerous potential points of failure. By effectively prioritizing risks, project managers can reduce the likelihood of catastrophic delays and cost overruns (Pinto, 2016).

- **Systems Theory**

Systems Theory, developed by Ludwig von Bertalanffy in the 1940s (Von Bertalanffy, 1968), views projects as interconnected systems, where changes in one component affect other parts of the system. In the context of large infrastructure projects like NIPP, Systems Theory emphasizes the interdependencies between different project elements, such as power generation, transmission, and distribution. Delays in one part of the project can have ripple effects throughout the entire system, making it essential to take a holistic approach to project management. For example, delays in gas supply infrastructure can prevent power plants from operating at full capacity, while delays in the construction of transmission lines can leave completed power plants underutilized, unable to deliver electricity to the grid. Similarly, failures in coordinating contractor schedules, material supply chains, or regulatory approvals can affect multiple facets of the project, creating a domino effect that impacts the overall timeline and budget (Shrestha, 2021).

This understanding enables more effective coordination between project teams, stakeholders, and contractors, fostering better communication and decision-making. Additionally, it highlights the importance of flexibility and adaptability in project planning. Systems Theory encourages project managers to anticipate potential disruptions and develop strategies that can accommodate changes without compromising the entire project. In the case of NIPP, a systems-based approach can also improve stakeholder management. With multiple government agencies, private contractors, and international partners involved in the project, coordination is critical to preventing delays. Systems Theory suggests

that these stakeholders should be viewed as part of a larger, interdependent system, where improved communication and cooperation can reduce the risk of project breakdowns.

By fostering a collaborative approach, Systems Theory can help mitigate the systemic risks associated with large-scale infrastructure projects, ensuring that delays in one area do not spread across the entire project ecosystem.

2.2 Key Prior Studies

Aibinu and Jagboro (2002) conducted a seminal study on construction delays in Nigeria. They identified 61 potential causes of delay, including client-related factors, contractor-related factors, and consultant-related factors. Their research underscored the significance of improved project management practices and better coordination among project stakeholders, emphasizing the need for more effective stakeholder collaboration to mitigate delays. Since then, numerous studies have corroborated these findings, showing that communication breakdowns, unclear project specifications, and resource constraints are recurrent issues in the Nigerian construction industry.

Ogunlana et al. (1996) investigated delays in power plant construction in Thailand, which revealed a different set of challenges. They identified resource shortages, poor contractor management, and delays in material supply chains as critical causes of delay in large-scale infrastructure projects. Their findings emphasized the importance of resource management and supply chain optimization—concepts that remain relevant today, particularly in resource-constrained environments like Nigeria. Ogunlana's research also highlighted the global nature of such delays, providing a comparative understanding of the issues faced in different developing economies.

In a broader Southeast Asian context, Sambasivan and Soon (2007) conducted a comprehensive study on the causes and effects of delays in the Malaysian construction industry. They identified ten key causes of delay, including contractor inefficiencies, subcontractor problems, and communication breakdowns between parties. These factors have parallels in Nigeria's National Integrated Power Projects (NIPP), where contractors often lack the necessary technical expertise, and poor communication between government entities and private contractors exacerbates project delays. Sambasivan and Soon's work underscores the need for a systemic approach to delay mitigation that accounts for all project stakeholders, from financiers to contractors.

Focusing on power projects in developing countries, Sovacool et al. (2014) analyzed 401 electricity infrastructure projects across 57 countries. Their study found that large-scale infrastructure projects, particularly hydroelectric dams and nuclear power plants, experienced the most significant cost overruns and construction delays. Sovacool et al. highlighted the complexities inherent in large power projects, including political, social, and environmental challenges. Their findings are particularly relevant to the NIPP, where delays have been influenced by a range of issues, from land acquisition disputes to bureaucratic hurdles in securing environmental permits. Their research illustrates the need for accurate initial planning and risk assessment in large-scale power projects.

In Nigeria, [Oyewobi et al. \(2011\)](#) conducted a study on the causes of delays in power project delivery, focusing on the NIPP. They identified several critical factors, including funding constraints, community resistance, and inadequate contractor performance. This study highlighted the importance of robust financial planning and better stakeholder management to ensure timely project execution. Similar issues were observed in other developing countries, where inadequate financial management often leads to significant delays and cost escalations in infrastructure projects ([Shrestha, 2021](#)).

More recently, [Omoregie and Radford \(2006\)](#) conducted a study on infrastructure delays and cost escalation in Nigeria. They found that the average time overrun was a staggering 188% of the original project duration. Their findings underscore the severity of delay issues in Nigerian infrastructure projects and the urgent need for more effective project management strategies. These delays not only inflate project costs but also diminish the intended economic benefits of the infrastructure.

A recent study by [Ikechukwu et al. \(2022\)](#) explores the role of Public-Private Partnerships (PPPs) in mitigating delays in Nigerian infrastructure projects. Their research found that PPPs, when properly structured, can alleviate many of the financial and managerial challenges associated with large-scale projects like the NIPP. However, the study also noted that poor regulatory frameworks and inconsistent government policies often undermine the effectiveness of PPPs, leading to further delays.

Collectively, these studies provide a strong foundation for understanding the causes and effects of delays in construction projects, particularly in the context of power infrastructure. They highlight common themes, such as the importance of effective planning, resource management, stakeholder coordination, and risk assessment. However, they also point to the need for more focused research on delays in power infrastructure projects in Nigeria, particularly in the context of large-scale initiatives like the NIPP.

2.3 Gaps or Limitations from Previous Studies

In reviewing the existing literature on construction project delays, particularly in the context of power infrastructure projects, several gaps and limitations become apparent. These gaps present opportunities for further research and more targeted investigations, especially concerning Nigeria's National Integrated Power Projects (NIPP).

One significant limitation in previous studies is the lack of specific focus on power infrastructure projects in Nigeria. While [Aibinu and Jagboro \(2002\)](#) provided valuable insights into construction delays in Nigeria, their study was broad and did not specifically address the unique challenges of power projects. Similarly, [Oyewobi et al. \(2011\)](#) touched on power project delivery in Nigeria, but their study was not comprehensive enough to fully capture the complexities of large-scale initiatives like NIPP.

Another gap in the existing research is the limited exploration of the interplay between different stakeholders in power infrastructure projects. While [Sambasivan and Soon \(2007\)](#) highlighted the importance of communication between parties, there is a lack of in-depth analysis of how the relationships between government entities, contractors, local communities, and international partners specifically impact project timelines in the Nigerian context.

The dynamic nature of the Nigerian political and economic environment presents another limitation in

previous studies. Many of the existing research, such as [Omoregie and Radford \(2006\)](#), while valuable, may not fully reflect the current realities of Nigeria's power sector, which has undergone significant changes in recent years. There is a need for more up-to-date studies that take into account recent policy changes, economic fluctuations, and technological advancements in the power sector.

Furthermore, there is a notable gap in the literature regarding the long-term effects of delays in power infrastructure projects. While studies like [Sovacool et al. \(2014\)](#) provide insights into cost overruns and delays across multiple countries, there is limited research on how these delays specifically impact the broader economic development and energy security of Nigeria.

Another limitation is the lack of comparative studies between NIPP and similar large-scale power projects in other developing countries. Such comparisons could provide valuable insights into best practices and potential solutions that might be applicable to the Nigerian context.

Additionally, most existing studies focus primarily on identifying causes of delays, with less emphasis on effective mitigation strategies. There is a need for more action-oriented research that not only identifies problems but also proposes and evaluates specific solutions within the Nigerian context.

Lastly, there is a gap in the literature regarding the application of modern project management tools and techniques to power infrastructure projects in Nigeria. While studies like [Ogunlana et al. \(1996\)](#) touch on project management issues, there is limited research on how advanced methodologies like agile project management or Building Information Modeling (BIM) could be applied to mitigate delays in Nigerian power projects.

Addressing these gaps and limitations in future research would significantly contribute to our understanding of delays in Nigerian power infrastructure projects and potentially lead to more effective strategies for managing and completing projects like NIPP on time and within budget.

3. Methodology

The study employed a descriptive quantitative research design, utilizing both primary and secondary data sources. The primary data was collected through questionnaires and direct personal interviews with professionals involved in NIPP construction projects. Secondary data was obtained from relevant literature, including textbooks and journals, to enrich the questionnaire design and provide context.

The research was conducted in two phases:

1. Phase 1: Data collection from the NIPP Data Department and the Office of Presidential Task Force on NIPP in Abuja. This phase involved gathering contract documents, project progress reports, and current project status information.
2. Phase 2: A structured questionnaire survey designed based on an extensive literature review of time performance assessments in construction projects. The questionnaire aimed to investigate and determine the major factors affecting NIPP time performance and the extent of their contribution.

The questionnaire was chosen as the primary data collection tool due to its convenience, cost-effectiveness, and time efficiency compared to face-to-face interviews, especially considering the large survey population spread across Nigeria's six geopolitical zones. The questionnaire was carefully designed to avoid common shortcomings such as wording issues, poor question structure, and low response rates.

The questionnaire consisted of three sections:

1. Respondent profile information

2. Questions on the extent of contribution of delay factors to NIPP delays
3. Questions on the effects of delays on NIPP

A non-probability purposive sampling technique was employed to select respondents knowledgeable and experienced in NIPP. The sample included professionals from client organizations, Engineering, Procurement, and Construction (EPC) contracting firms, and project consulting firms involved in NIPP implementation.

Before full distribution, the questionnaire was piloted on two contractor respondents and two consultant respondents to ensure clarity and understanding. Based on their feedback, necessary alterations were made. The final questionnaire was then distributed to a random sample of 75 professionals working in NIPP client, consulting, and contracting companies.

3.1 Method of Analysis

Primarily utilizing Python, this software was chosen for its capability to efficiently organize and process large survey datasets in a systematic and reliable manner.

The analysis began with data cleaning and preparation, which involved checking frequency and descriptive statistics, as well as coding and data entry. This step was crucial in ensuring the accuracy and reliability of the subsequent analysis.

At the core of the analytical approach was the Importance Index Technique, which was used to identify and rank the most frequent causes of delay from the survey responses. This method allowed the researchers to determine which factors were most commonly cited across different groups of respondents, including clients, contractors, and consultants.

The primary analytical tool employed was the Relative Importance Index (RII) method. This technique was used to quantify the extent to which each identified factor contributed to delays in the NIPP.

The RII was calculated using the formula:

$$RII = \sum W / (A \times N),$$

Where;

W represents the weight given to each factor by respondents (ranging from 1 to 5),

A is the highest weight (5), and

N is the total number of respondents.

The resulting RII values, ranging from 0 to 1, provided a clear measure of each factor's importance, with higher values indicating a greater contribution to delays.

Based on these RII values, the researcher ranked the delay factors from highest to lowest. This ranking process allowed for a clear visualization of which factors were perceived as most significant in contributing to delays in the NIPP. The results were then presented using a combination of tables, graphs, and percentages to effectively communicate the findings.

The analysis included comparative elements, examining how perceptions of delay causes and effects varied among different groups of respondents. This comparative approach provided insights into how different stakeholders in the NIPP viewed the challenges facing the projects.

Throughout the analysis, descriptive statistics were used to summarize and present the data, including measures such as frequencies, percentages, and possibly means or medians. These techniques allowed for a comprehensive overview of the survey responses and helped in identifying patterns and trends in the data.

3.2 Limitations and Assumptions

Limitations:

1. Geographical Constraints: While the study aimed to cover NIPP projects across the six geopolitical zones of Nigeria, there were limitations in

Respondents	Distributed	Returned	% Responses
Client	25	20	80%
Contractors	25	22	88%
Consultants	25	18	72%
Total	75	60	80%

accessing all relevant sites or personnel, particularly in more remote or politically unstable areas.

2. Response Rate: The study achieved an 80% response rate (60 out of 75 questionnaires), which, while good, still means that 20% of the targeted sample did not participate. This could potentially introduce some bias in the results.
3. Time Constraints: The data collection process took 5 weeks, which may have limited the depth of information gathered, especially from respondents who needed more time to provide comprehensive answers.
4. Respondent Availability: There were challenges in meeting respondents or instances where respondents had misplaced their questionnaires, requiring new ones to be provided. This could have affected the quality or consistency of responses.
5. Respondent Reluctance: Some potential respondents declined to participate, even when assured of anonymity. This could have led to a loss of potentially valuable insights.
6. Subjectivity: The study relies heavily on the perceptions and opinions of the respondents, which may introduce an element of subjectivity into the findings.

Assumptions:

1. Respondent Knowledge: It was assumed that the selected respondents had sufficient knowledge and experience with NIPP to provide accurate and relevant information.
2. Honesty of Responses: The study assumes that respondents answered honestly and to the best of their ability, without any intentional misrepresentation.
3. Representativeness: The purposive sampling technique assumes that the selected sample is representative of the larger population involved in NIPP.
4. Relevance of Identified Factors: The 50 causes of delay and 14 effects of delay identified through literature review and expert interviews are assumed to be comprehensive and relevant to the Nigerian context.
5. Validity of RII Method: The study assumes that the Relative Importance Index (RII) is an appropriate and valid method for ranking the importance of delay factors in this context.
6. Stability of Conditions: The study assumes that the conditions affecting NIPP projects remained relatively stable during the research period and that the findings would remain relevant for a reasonable period after the study's completion.
7. Generalizability: While focused on NIPP, the study assumed some level of generalizability to other large-scale infrastructure projects in Nigeria or similar developing countries.

4. Results and Discussion of Findings

Table 4.1 below gives a breakdown as regards the distribution of the respondents.

Table 4.1 Questionnaire distribution and responses

Of these respondents 45% were engineers, with other professionals including quantity surveyors, architects, and builders; 47% had over 7 years of experience in NIPP projects; 87% had participated in more than 5 NIPP projects.

Table 4. 2: Respondents' Experience in NIPP

Years of Experience	Frequency	Percent
Less than 2 years	5	8%
2 - 4 years	8	13%
5-7 years	19	32%
Above 7 years	28	47%
Total	60	100%

The majority of respondents (79%) had over 5 years of experience in NIPP projects. This provides room to be able to bank on the data from them as they definitely have ample and good experience in the field.

Table 4.3: Respondents' Project Participation

No. of Projects	Frequency	Percent
1 - 4 projects	8	13%
5 - 10 projects	21	35%
11 - 15 projects	24	40%
Above 15 projects	7	12%
Total	60	100%

87% of respondents had participated in more than 5 projects, indicating a high level of experience among the survey participants.

Table 4.4: Magnitude of Project Delays

Magnitude of Delays	Frequency	Percent
All the projects	54	90%
Majority of projects	6	10%
Few of the projects	0	0%
None of the projects	0	0%
Total	60	100%

100% of respondents agreed that NIPP projects suffered delays, with 90% indicating that all projects were delayed.

4.2 Top Causes of Delay

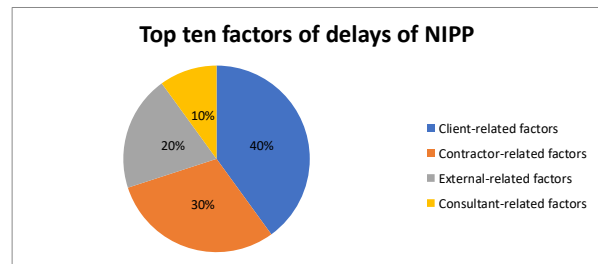
The most significant cause was the award of contracts to political party loyalists instead of industry-adjudged competent contractors. This practice violated due process and resulted in contractors lacking the necessary technical capacity and competence to execute the projects effectively.

Closely following this was deliberate non-performance by contractors due to their friendships with government officials in power. Despite clear contractual obligations and provisions for sanctions, non-performing contractors were not held accountable, likely due to their political connections.

Litigation and political scrutiny also played a major role in causing delays. Following a change in administration in 2007, the NIPP funding arrangements were subjected to intense legal and political scrutiny, resulting in a two-year interruption in project funding. This suspension led to

numerous issues, including damaged equipment, missing parts, and expired warranties.

Poor feasibility studies by the client's project manager contributed significantly to delays.



Inadequate technical and financial feasibility assessments led to problems such as hardware incompatibility, software issues, and uneconomical right-of-way acquisitions.

These issues could have been avoided with proper planning and research.

The client's delay in acquiring right-of-way projects was another top cause of delays. The process of valuation, acquisition, compensation, and resettlement of residents and business owners being displaced due to right-of-way acquisition was fraught with problems and considerably slowed project progress.

Unforeseen site conditions, irregular payment of subcontractors by main contractors, shortage of specialist personnel, and delays in approving designs and drawings rounded out the top causes of delays in the NIPP projects. These factors collectively contributed to the significant time and cost overruns experienced in these critical infrastructure projects.

Top Effects of Delay

Time overrun was identified as the primary effect of the delays. The projects consistently failed to meet their scheduled completion dates, extending far beyond their original timelines. This prolonged execution period had cascading effects on various aspects of the projects and the broader power sector in Nigeria.

Overrun cost was the second most significant effect. As projects dragged on, expenses mounted due to factors such as inflation, additional labor costs, extended equipment rentals, and the need to replace damaged or obsolete materials and equipment. These increased costs put a strain on the project budgets and potentially compromised the economic viability of the projects.

The delays also had a substantial negative social impact, ranking as the third most significant effect. The failure to deliver much-needed power infrastructure on time likely contributed to continued power shortages, affecting businesses, households, and overall economic development in Nigeria. This could have led to public frustration and a loss of confidence in the government's ability to address the country's power needs.

The fourth major effect was the tying down of client capital due to non-completion of projects. As projects remained unfinished, the capital invested in them couldn't be utilized effectively, potentially preventing its use in other critical areas or projects. This inefficient use of resources could have had broader economic implications for the country.

Lastly, the under-utilization of contractors' manpower was identified as a significant effect. Delays often led to periods of inactivity or reduced activity on project sites, resulting in inefficient use of the workforce. This not only affected the contractors' operations and profitability but could also have had negative impacts on employment and skill development in the sector.

These top five effects highlight the far-reaching consequences of the NIPP delays, impacting not just the immediate project stakeholders but also the broader economy and society. They underscore the critical

importance of addressing the root causes of delays in large-scale infrastructure projects to ensure timely and cost-effective delivery of essential services.

4.3 Client-Related Factors

Client-related delays are often the most significant, particularly in publicly funded projects like NIPP, where government involvement is extensive. The top five client-related factors identified in this study, based on their RII scores, reflect systemic issues in project planning, resource allocation, and political interference. These factors are often exacerbated by bureaucratic inefficiencies and the politicization of decision-making processes.

Award of Contracts to Political Party Loyalists (RII: 0.95). One of the most critical issues in client-related delays is the awarding of contracts to political party loyalists rather than to competent contractors. This practice undermines the integrity of the project by prioritizing political affiliations over technical qualifications, leading to delays when politically favored contractors lack the necessary expertise or capacity to execute the project efficiently. Such political interference erodes trust between stakeholders and creates an environment where accountability is minimal, allowing underperformance to persist unchecked (Oyewobi et al., 2011).

Poor Feasibility Studies by Client's Manager (RII: 0.91). Feasibility studies are essential for accurately assessing the technical, financial, and operational aspects of large projects. Poorly conducted feasibility studies by client managers often result in unrealistic cost estimates, timelines, and resource requirements, leading to project delays when unforeseen challenges arise during the implementation phase. Inaccurate feasibility assessments can also lead to scope changes, necessitating contract renegotiations, which further delay project execution.

Client's Delay in Acquisition of Right of Way (RoW) (RII: 0.87). Delays in acquiring the necessary land or rights of way for infrastructure projects are a significant bottleneck in NIPP and similar projects. Issues with land acquisition often stem from legal disputes, inadequate compensation for displaced communities, and slow bureaucratic procedures.

Late Approval for Payment by Client (RII: 0.85): Delays in payment approvals by the client can severely hinder project progress. Contractors rely on timely payments to fund their operations, procure materials, and pay workers.

Unrealistic Contract Durations Imposed by Client (RII: 0.51). Unrealistic expectations regarding project timelines are another critical issue. Often, clients impose strict deadlines without fully considering the complexities and challenges involved in project execution. These delays could be avoided with more accurate scheduling and consideration of the inherent risks and challenges during the planning phase (Omeregie & Radford, 2006).

Consultant-Related Factors: Consultants play a pivotal role in the design and planning phases of infrastructure projects. Delays caused by consultants are often related to inefficiencies in the approval process, poor communication, and inadequate project oversight. The top five consultant-related delay factors identified by the study reveal critical gaps in project management and coordination.

Consultant's Delay in Approving Designs/Drawings (RII: 0.68): Consultants are responsible for approving technical designs and drawings before construction can proceed. Delays in this process can halt project progress, as contractors are unable to begin or continue work without the necessary approvals. These delays are often due to a lack of coordination between project stakeholders or inadequate staffing within consulting firms, which slows the review and approval process.

Consultant's Delay in Issuing Instructions (RII: 0.47): Consultants also provide critical instructions to contractors during the construction phase. When these instructions are delayed or unclear, contractors may be forced to halt work or proceed without full clarity, leading to mistakes that require costly rework. These delays can often be attributed to poor communication between consultants and contractors, exacerbated by a lack of clear protocols for decision-making and instruction issuance.

Inadequate Consultant Experience (RII: 0.45): In many cases, delays arise because consultants lack the necessary experience to manage large-scale, complex projects like NIPP. This results in project slowdowns as errors are corrected or as consultants struggle to provide appropriate guidance to contractors (Sambasivan & Soon, 2007).

Lack of Effective Project Control (RII: 0.44). Effective project control requires continuous monitoring and evaluation of progress to ensure that project milestones are being met. A lack of oversight and control from consultants can lead to delays as issues are not identified and addressed promptly.

Poor Communication Between Consultant Staff (RII: 0.43): Communication breakdowns within consulting teams can result in delays, as important information is not shared in a timely or effective manner. In large projects like NIPP, where multiple consultants may be working on different aspects of the project, poor communication can lead to misunderstandings, redundant work, and missed deadlines.

4.4 Analysis of Key Factors

The study's analysis reveals that political factors, poor planning, and approval delays are significant contributors to project delays, particularly in the client-related and consultant-related categories. The award of contracts based on political loyalty rather than merit is a critical issue, as it often results in the selection of contractors who are ill-equipped to handle the complexity of large-scale infrastructure projects.

Consultant-related factors, while less significant in terms of overall impact compared to client-related factors, still play a critical role in causing delays. The slow approval of designs and drawings, inadequate experience, and poor project control all point to a need for better project management practices within consulting firms.

5. Conclusion and Policy Implications

The study provides a comprehensive analysis of the causes and effects of delays in Nigeria's National Integrated Power Projects (NIPP), a critical initiative aimed at improving the country's power infrastructure. Utilizing both primary and secondary data sources, the study

identified and ranked the major factors contributing to delays, shedding light on the intricate challenges that have prevented timely completion of NIPP projects. The analysis revealed that client-related factors, including the awarding of contracts to political party loyalists and poor feasibility studies, were the most significant contributors to project delays. Other notable factors included consultant inefficiencies in design approvals and contractor-related issues such as poor management practices.

The consequences of these delays are far-reaching, impacting not only the project timelines but also the broader economic and social fabric of Nigeria. The persistent delays in NIPP projects exacerbate Nigeria's power crisis, stifling industrial growth, hindering business operations, and limiting the overall economic development of the nation.

The Relative Importance Index (RII) analysis, combined with comparative assessments between different stakeholder groups, provides a nuanced understanding of the specific areas where project management improvements can be made. It is clear from the findings that political interference, inadequate planning, and inefficient resource management are the key drivers of delays, and addressing these issues is paramount to ensuring the success of future infrastructure projects in Nigeria.

The findings of this study suggest several critical policy actions to mitigate delays in future infrastructure projects like NIPP. First, policymakers must strengthen governance by ensuring transparency and accountability in the contract awarding process to minimize political interference. Second, improving the rigor of feasibility studies and project planning will help avoid unrealistic timelines and cost underestimations. Third, efficient financial management systems should be implemented to ensure timely payment approvals and continuous project funding. Additionally, building the capacity of consultants and contractors through training and stricter vetting processes will enhance project execution.

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