ISIR Journal of Arts, Humanities and Social Sciences (ISIRJAHSS)
ISSN: 3048-7463 (Online)
Frequency: Bimonthly
Published By ISIR Publisher
Journal Homepage Link- https://isirpublisher.com/isirjahss-home/

"Bridging the Infrastructure Gap in Emerging Economies: An evaluation of the Role of Development Finance and Public-Private Partnerships in Nigeria's Infrastructure Transformation – Challenges, Opportunities, and Strategic Pathways"

BY

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Article History

Received: 25/05/2025
Accepted: 10/06/2025
Published: 12/06/2025

Vol – 2 Issue – 3

PP: -07-20

DOI:10.5281/zenodo.15666587

Abstract

Nigeria's persistent infrastructure deficit remains a critical impediment to its economic growth, sustainable development, and global competitiveness. Despite multiple public sector interventions, constrained fiscal capacity, rising debt burdens, and systemic inefficiencies have limited the impact of traditional government-led infrastructure delivery. In response, Public-Private Partnerships (PPPs) have emerged as a strategic alternative for mobilizing private sector investment, enhancing project efficiency, and accelerating infrastructure expansion. This study critically investigates the effectiveness, challenges, and prospects of PPPs in Nigeria, with a focus on high-impact projects across key sectors such as transportation and energy. Adopting a mixed-methods research design, the study combines a comprehensive review of policy documents and academic literature with semi-structured interviews involving government officials, private investors, development finance experts, and civil society stakeholders. Case studies of selected PPP projects were evaluated using performance metrics including cost-efficiency, risk-sharing structures, and service delivery outcomes. The analysis reveals that while PPPs have contributed to infrastructure development in Nigeria—evidenced by improved service delivery and innovation in some projects—their potential is undermined by regulatory ambiguities, weak institutional capacity, poor project preparation, and governance deficits. The study concludes that a more robust and transparent PPP framework, strengthened by institutional reforms, stakeholder engagement, and innovative financing mechanisms, is essential for unlocking Nigeria's infrastructure potential. By strategically leveraging PPPs and aligning them with long-term national development priorities, Nigeria can bridge its infrastructure gap, foster inclusive economic transformation, and contribute meaningfully to global sustainable development goals.

Keywords: *Public-Private Partnerships, Infrastructure Finance, Development Policy, Risk Transfer, Institutional Reform.*

1. Introduction

Despite Nigeria's strategic position as Africa's largest economy and one of the most resource-rich nations on the continent, its infrastructure deficit remains a critical impediment to sustainable development, economic diversification, and global competitiveness. The World Bank estimates that Nigeria needs to invest approximately $100 billion annually for the next decade to bridge its infrastructure gap; however, current public spending falls significantly short of this target. Limited fiscal space, rising debt burdens, and inefficiencies in public sector project delivery have

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necessitated the exploration of alternative financing models, particularly public-private partnerships (PPPs) and development finance instruments.

Public-private partnerships, when effectively structured, offer a viable solution to Nigeria's infrastructure challenges by leveraging private sector expertise, capital, and innovation. In parallel, development finance institutions (DFIs) have emerged as critical players in de-risking investments, co-financing large-scale projects, and promoting inclusive infrastructure growth. However, the Nigerian PPP landscape continues to face substantial obstacles, including weak regulatory frameworks, institutional bottlenecks, political interference, limited capacity for project preparation, and investor skepticism due to past failures.

Despite the growing adoption of PPPs and increased DFI involvement, there is insufficient empirical analysis on the actual effectiveness of these partnerships in Nigeria's infrastructure development. There is also a lack of clarity on how these mechanisms can be strategically optimized to achieve long-term developmental goals. This disconnect between policy intentions and practical outcomes presents a significant knowledge gap that this study seeks to fill.

Therefore, this research is driven by the urgent need to investigate the interplay between development finance and PPPs in Nigeria, assess their impact on infrastructure delivery, identify persistent challenges, and explore opportunities for reform. By doing so, the study aims to provide a strategic roadmap for unlocking Nigeria's infrastructure potential in a manner that is sustainable, inclusive, and globally competitive.

2. Statement of the Problem

Despite Nigeria's strategic position as Africa's largest economy and one of the most resource-rich nations on the continent, its infrastructure deficit remains a critical impediment to sustainable development, economic diversification, and global competitiveness. The World Bank estimates that Nigeria needs to invest approximately $100 billion annually for the next decade to bridge its infrastructure gap; however, current public spending falls significantly short of this target. Limited fiscal space, rising debt burdens, and inefficiencies in public sector project delivery have necessitated the exploration of alternative financing models, particularly public-private partnerships (PPPs) and development finance instruments.

Public-private partnerships, when effectively structured, offer a viable solution to Nigeria's infrastructure challenges by leveraging private sector expertise, capital, and innovation. In parallel, development finance institutions (DFIs) have emerged as critical players in de-risking investments, co-financing large-scale projects, and promoting inclusive infrastructure growth. However, the Nigerian PPP landscape continues to face substantial obstacles, including weak regulatory frameworks, institutional bottlenecks, political interference, limited capacity for project preparation, and investor skepticism due to past failures.

Despite the growing adoption of PPPs and increased DFI involvement, there is insufficient empirical analysis on the actual effectiveness of these partnerships in Nigeria's infrastructure development. There is also a lack of clarity on how these mechanisms can be strategically optimized to achieve long-term developmental goals. This disconnect between policy intentions and practical outcomes presents a significant knowledge gap that this study seeks to fill.

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3. Purpose of the Study

The primary purpose of this study is to critically assess the role of development finance in Nigeria, with a specific focus on evaluating the effectiveness of public-private partnerships (PPPs) as a mechanism for unlocking the country's infrastructure potential. The study was guided by the following specific objectives:

i. To analyze the current state of infrastructure development in Nigeria and identify the major financing gaps hindering progress.

ii. To assess the effectiveness of public-private partnerships (PPPs) as a model for infrastructure development, using selected case studies.

iii. To identify the key challenges and risks associated with implementing PPPs in the Nigerian context, including regulatory, institutional, and socio-political barriers.

iv. To assess the strategic implications of adopting PPPs and blended finance mechanisms for Nigeria's long-term economic growth and sustainable development.

v. To provide policy recommendations aimed at enhancing the efficiency, transparency, and scalability of development finance and PPP frameworks in Nigeria.

4. Research Questions

i. What is the current state of infrastructure development in Nigeria and identify the major financing gaps hindering progress?

ii. What has been the sectoral level of effectiveness of public-private partnerships (PPPs) Model for infrastructure development in Nigeria?

iii. What are the key challenges and risks associated with implementing PPPs in the Nigerian context?

iv. What are the strategic implications of adopting PPPs and blended finance mechanisms for

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Nigeria's long-term economic growth and sustainable development?

v. What are the policy recommendations that can be used to enhance efficiency, transparency, and scalability of development finance and PPP frameworks in Nigeria?

5. Significance of the Study

The study contributes to the expanding body of knowledge on development finance and public-private partnerships (PPPs) in Sub-Saharan Africa. Given the rising global interest in infrastructure financing in emerging markets, particularly under the frameworks of the United Nations Sustainable Development Goals (SDGs) and climate-resilient infrastructure, this study provides lessons with international applicability. This research supports the broader national agenda of economic diversification, job creation, poverty alleviation, and regional integration. The study provides evidence-based recommendations for public sector institutions, private investors, and multilateral development organizations seeking to engage in infrastructure development in Nigeria.

6. Literature Review

i. Theoretical Framework

➢ **Principal –Agent Theory**

Principal-agent theory was developed in 1976 by Michael Jensen and William Meckling. The theory is a framework that describes the relationship between a principal and an agent, where the principal delegates tasks to the agent. The theory is used to understand the potential conflicts that can arise when the agent's decisions don't align with the principal's goals. The agent may have a conflict of interest with the principal, which can lead to misaligned decisions.

Figure 2.1: Below states a generic PPP Agreement

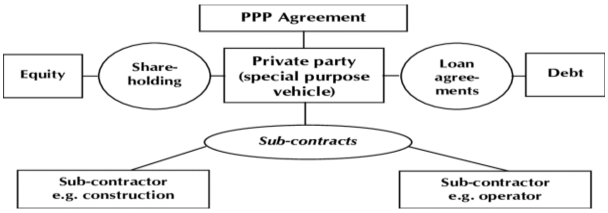

Figure 2.1: Generic PPP Agreement **Source**: Farlam (2005)

In the context of Public-Private Partnerships (PPP) in Nigeria, "principal-agent theory" describes the dynamics where the government acts as the "principal," delegating tasks to a private company (the "agent") to develop infrastructure, but must design mechanisms to ensure the private company aligns its interests with the public good, as there is a potential for the private company to prioritize profit over public benefit due to information asymmetry and conflicting goals.

Some of the key points about principal-agent theory in Nigerian PPPs are

i. The government (principal) may not have complete information about the private company's (agent) capabilities and costs, leading to a tendency of private company exploiting this gap for personal gain.

ii. To mitigate this, the government needs to design contracts with appropriate incentives, like performance-based payments, to ensure the private company delivers quality services and meets project objectives.

iii. The government needs to establish robust monitoring mechanisms to track project progress and ensure the private company adheres to contractual obligations.

➢ **The Stakeholder Theory:**

The Stakeholder Theory was developed by R. Edward Freeman in 1984, the theory, posits that an organization should consider the interests of all its stakeholders, collaboration, mutual benefit, and long-term value creation over short-term profit maximization.

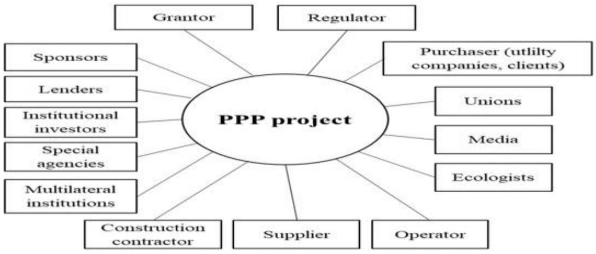

Figure 2.2 PPP stakeholders Source: ojewnik-Filipkowska and Wegrzyn (2019)

The stakeholder theory aligns with the core of PPP arrangements — collaboration between the public and private sectors, as well as communities and end-users. In Nigeria, effective PPPs require input and engagement from, Federal and state governments, Private investors and developers, Regulatory agencies, Local communities, civil society organizations, Beneficiaries (e.g., commuters, patients, and students). By considering the interests of all stakeholders, PPP projects can foster trust and accountability. It also promotes dialogue and mutual understanding. In Nigeria, conflicts often arise in PPP projects due to land acquisition, environmental impact, and unmet expectations. A stakeholder approach encourages early engagement and continuous communication, helping to resolve disputes amicably. Integrating all the stakeholder and considering the long-term welfare of the community, rather than focusing solely on financial returns, makes outcomes more effective, which leads to resilient infrastructure and improved public services.

ii. Conceptual Review

The Council for Development Finance Agency (CDFA) defined development finance as "the efforts of local communities to support, encourage, and catalyse expansion through public and private investment in physical development, redevelopment, and/or business and industry". According to African Development Bank (AfDB), "Development finance involves financial services and products that facilitate the growth and expansion of economic sectors that have a direct impact on poverty reduction and

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employment generation" Development finance, in essence, is the strategic use of financial resources to foster development outcomes, encompassing both public and private investment. It involves mobilizing and allocating funds to support projects and initiatives that benefit communities and promote sustainable growth.

The World Bank defines Public-Private Partnerships (PPPs) as "A long-term contract between a private party and a government entity for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance." At their core, PPPs represent a long-term contractual arrangement between a public authority and a private sector entity, whereby the private party assumes significant risk and responsibility for financing, designing, implementing, and operating infrastructure projects or services, while the public sector maintains regulatory oversight and ensures public interest.

Table 1: Public-Private Partnership (Types) Terminologies

Commonly Used Terminology in PPP	**Meaning**
BOT - Build-Operate-Transfer	It means private investor builds a facility, sells the output to the public sector, and transfers it at the end of the contract.
BRT - Build-Rent-Transfer	It means private investor builds facility, rents it out, and transfer at the end of contract.
BTO - Build-Transfer-Operate	It means private vendor builds facility, transfers to government, who either operates directly or contract out.
CONCESSION	It means private vendor (concessionaire) may or may not build facility, but is allowed to manage the facility and charge users a fee for use of the facility.
DBB - Design-Bid-Build	Here government agency provides design, puts out tenders and winner builds the facility
DBFO - Design, Build, Finance and Operate,	It means government designs the facility; private vendor finances building and operates for cost recovery
DBMF - Design, Construct, Maintain and Finance	It means government designs, private sector constructs and maintains, and government finances.
EPC CONTRACT - Engineering, Procurement and Construction	It means contractor proves a complete installation to specification, at a fixed price and to a fixed schedule.
FRANCHISE	Here the service provider is allowed to charge a service fee for the use of the infrastructure or service which has already been built.
Lease/Maintain	It mean private vendor pays rent for facility and utilizes the resources
Output specification	It means government agency specifies "outputs," and private vendor designs, finances and builds the infrastructure
RLT - Rehabilitate-Lease-Transfer	It means vendor rehabilitates a facility, signs lease agreement on facility with government agency, and transfers at the end of contract
ROT- Rehabilitate-Operate-Transfer	It means private entity rehabilitate facility operates to the extent of full cost recovery, and transfers.

Sources: Afolabi (2011) and Centre for Sustainability in Mining and Industry (2012) cited in Madu and Kenigua (2021).

Research Question one: What is the current state of infrastructure development in Nigeria and identify the major financing gaps hindering progress?

Infrastructure development plays a pivotal role in enhancing economic growth, fostering industrialization, and improving the quality of life in any nation. In Nigeria, the infrastructure deficit has reached a critical level, affecting virtually all sectors of the economy. Existing literature underscores the complexity of Nigeria's infrastructural landscape and the persistent financing challenges that hinder sustainable development. The Nigerian infrastructure landscape is characterized by widespread underdevelopment, poor maintenance, and regional disparities. The transport sector, comprising roads, railways, airports, and seaports, is one of the most visibly affected. The Federal Ministry of Works and Housing (2021) reported that over 70% of federal roads are in poor condition, limiting mobility and trade. While some progress has been made in rail revival projects, such as the Lagos-Ibadan and Abuja-Kaduna railway lines, most routes remain dilapidated or non-functional (Adebayo & Iweka, 2020).

The energy sector is equally challenged, with a population exceeding 200 million, Nigeria generates less than 4,000 megawatts of electricity for consumption on most days (World Bank, 2021). Chronic power shortages not only affect households but also impede industrial productivity and discourage foreign investment. Similarly, the housing and

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water supply sectors suffer from significant deficits. The country faces a housing shortfall of over 17 million units (UN-Habitat, 2020), and access to clean water remains below target in many rural and peri-urban communities. These conditions collectively underscore the urgent need for long-term infrastructure development strategies.

One of the major barriers to infrastructure development in Nigeria is inadequate and unsustainable financing mechanisms. Traditionally, infrastructure funding has relied heavily on public budget allocations, which are often constrained by fluctuating oil revenues, high debt servicing costs, and competing social spending demands (Okonkwo & Eboh, 2019). As of 2023, Nigeria's debt service-to-revenue ratio was estimated at over 90%, further limiting fiscal space for capital investments (IMF, 2023).

Moreover, private sector participation remains limited, largely due to weak PPP frameworks, political and regulatory risks, and lack of bankable projects. Osei-Kyei and Chan (2017) noted that although Nigeria has attempted to attract private capital through PPPs, institutional weaknesses and poor contract enforcement continue to deter investors. Another critical issue is the underutilization of development finance institutions (DFIs). While institutions such as the Africa Finance Corporation (AFC) and the Nigeria Sovereign Investment Authority (NSIA) have contributed to financing select projects, their reach and scale remain insufficient relative to the country's massive infrastructure needs (Akinola & Olomola, 2019). Furthermore, there is a lack of innovative financing models such as infrastructure bonds, diaspora funding instruments, and blended finance. The domestic capital market is underdeveloped and does not yet provide deep pools of long-term finance required for large-scale infrastructure development (Eromosele, 2020).

Research Question two: *What has been the sectoral level of effectiveness of public-private partnerships (PPPs) Model for infrastructure development in Nigeria?*

Several studies have assessed the performance of PPP projects in Nigeria using various criteria such as project completion, cost-efficiency, service quality, and risk allocation. Empirical evidence shows that PPPs have contributed to faster project delivery in some cases. For example, the MM2 Airport Terminal**,** operated by Bi-Courtney Aviation Services, was completed within the stipulated period and has been regarded as a model for aviation PPPs (Adebayo & Iweka, 2020). However, many other projects have suffered delays and cost overruns due to regulatory, financial, and political challenges (Akintoye et al., 2016).

On Cost-Efficiency and Value for Money, Ogboi and Obiora (2018) argue that many PPP projects in Nigeria have not demonstrated clear cost savings compared to traditional public procurement due to inflated concession agreements and limited competition. The quality of services delivered through PPPs varies by sector. For instance, privately managed toll roads like the Lekki-Epe Expressway have improved road conditions and maintenance, but have faced public backlash over toll pricing and transparency (Ibem & Aduwo, 2017).

Most PPP contracts in Nigeria often lack clear risk-sharing mechanisms. In many cases, the government ends up bearing a disproportionate share of financial or political risks, thereby undermining the private sector's incentive to perform efficiently (Oluwasanmi & Ogunlana, 2019). While projects such as the Apapa Port Terminal Concessions have improved port operations, road projects often face land acquisition and community resistance challenges. The post-privatization phase of Nigeria's power sector involved PPP elements, especially in distribution and generation. However, regulatory uncertainty and liquidity issues continue to affect investor confidence (Adeniran & Yusuf, 2021). Osei-Kyei and Chan (2016) suggest that successful PPPs in emerging markets require strong legal frameworks, transparent procurement, equitable risk sharing, and effective stakeholder engagement. These elements are still evolving in the Nigerian context, highlighting the need for capacity-building and strategic reforms.

Research Question three: *What are the key challenges and risks associated with implementing PPPs?*

One of the most significant challenges in PPP implementation is the uncertainty of the political and regulatory environment**.** "Political risk remains one of the most critical concerns for PPP investors in sub-Saharan Africa, as abrupt policy changes can disrupt contract enforcement and project continuity" (Hammami et al., 2006). A lack of clear, transparent, and enforceable legal frameworks often leads to disputes and project delays. In many cases, ineffective contract enforcement and the absence of a reliable dispute resolution system hinder project sustainability. "For PPPs to thrive, countries must establish strong institutional frameworks with clearly defined roles and accountability mechanisms" (World Bank, 2021). Despite efforts such as the establishment of the Infrastructure Concession Regulatory Commission (ICRC) in Nigeria, enforcement and oversight capacities remain underdeveloped. Many PPP projects in developing countries face financing constraints**,** including high interest rates, lack of long-term credit facilities, and underdeveloped capital markets. "Inadequate domestic capital and the high-risk profile of infrastructure projects often limit the ability of local banks to fund PPPs sustainably" (Yescombe, 2017). Private investors may also be reluctant to invest in projects with uncertain revenue streams or unguaranteed government support. "Non-transparent selection processes and limited stakeholder engagement often lead to the selection of inefficient or politically influenced private partners" (OECD, 2018).This challenge is particularly relevant in countries with weak anti-corruption institutions or limited civic oversight.

Research Question four: *What are the strategic implications of adopting PPPs and blended finance mechanisms for Nigeria's long-term economic growth and sustainable development?*

In the context of declining public revenues and rising development needs, PPPs and blended finance serve as strategic alternatives to traditional budget-funded infrastructure investment.

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The term blended finance implies the mixing of both public and private funds through a common investment scheme or deal, with each party using their expertise in a complementary way. The concept and model was developed within the Redesigning Development Finance Initiative from the World Economic Forum (2016), who defined it as "the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets. In Nigeria, the National Development Plan (2021–2025) emphasizes the critical role of the private sector in funding infrastructure, recognizing PPPs and blended finance as essential tools to achieve the country's Vision 2050 goals. The strategic implication is a shift from government-led to market-driven development, allowing Nigeria to leverage external expertise, technology, and funding sources for broader socioeconomic transformation (Federal Government of Nigeria, 2021). Akinwale and Olayemi (2020) observed a positive correlation between PPP investments in transport and power sectors and Nigeria's GDP growth. Their findings suggest that efficient PPP implementation can accelerate capital formation, reduce infrastructure bottlenecks, and improve productivity. Similarly, Yescombe (2017) argued that PPPs can lead to long-term efficiency gains through optimal risk allocation, innovation in project execution, and accountability mechanisms, which ultimately translate into macroeconomic benefits.

Blended finance is increasingly aligned with the pursuit of the Sustainable Development Goals (SDGs). Development Initiatives (2021) reports that blended finance has been instrumental in funding climate-resilient infrastructure, clean energy, and social sector projects in sub-Saharan Africa. For Nigeria, adopting blended finance can strategically attract institutional investors, such as pension funds and sovereign wealth funds, into long-term infrastructure assets. According to UNDP (2020), blended finance not only increases the volume of capital but also ensures that investment aligns with social and environmental objectives, which is critical for inclusive and sustainable development. Blended finance is particularly suited for climate-smart infrastructure. With growing climate risks, strategic use of green bonds, climate funds, and impact investments through blended structures can help Nigeria build resilient and sustainable cities (World Bank, 2021).

Improved infrastructure catalyzed by blended finance and PPPs has a multiplier effect on sectors such as agriculture, manufacturing, and ICT. This can contribute to structural transformation and job creation, positioning Nigeria as a competitive emerging economy (Aigbokhan & Oriakhi, 2019).

Research Question five: *What are the policy recommendations that can be used to enhance efficiency, transparency, and scalability of development finance and PPP frameworks in Nigeria?*

According to Yescombe (2017), a predictable and enforceable legal framework is fundamental to attracting and retaining private investors in infrastructure development. In Nigeria, the Infrastructure Concession Regulatory Commission (ICRC) has been pivotal, but literature highlights the need for broader reforms and harmonization of laws at federal and sub-national levels to eliminate legal ambiguity (Osei-Kyei & Chan, 2016).

The African Development Bank (AfDB, 2020) and World Bank (2021) argue for centralized project preparation facilities that can support public agencies with feasibility studies, risk assessments, and financial modeling. Nigeria's lack of a strong pipeline of investable projects is often due to limited technical capacity and poor coordination among ministries. Establishing a national PPP project preparation fund or unit can reduce lead times and boost project credibility among private investors.

OECD (2018) stresses the use of e-procurement systems, open contracting data standards (OCDS), and proactive disclosure of PPP contracts. In the Nigerian context, opaque procurement practices have hindered public trust and undermined the value-for-money principle (Amobi, 2013). Blended finance—combining public, philanthropic, and private capital—has been promoted by institutions like the World Economic Forum (2019) and UNDP (2020) as a scalable model for infrastructure financing. In Nigeria, such instruments can reduce perceived risk and incentivize long-term private investment in sectors with high social returns but low commercial viability. It is necessary to expand the use of viability gap funding (VGF), guarantees, and first-loss capital through institutions like the Nigeria Sovereign Investment Authority (NSIA) and AfDB.

Akitoby et al. (2020) suggest that many failures in PPP arrangements stem from information asymmetry and poor contract oversight. Nigeria suffers from institutional knowledge gaps and frequent changes in personnel. There is need to increase capacity through training, technical assistance, and knowledge-sharing partnerships with international PPP units can address this deficit. As Ehlers et al. (2020) note, developing infrastructure bonds and green bonds can unlock pension funds and insurance capital for PPPs. There is need to deepen the domestic bond market and provide incentives for institutional investors to support infrastructure development. The World Bank (2021) recommends performance dashboards with key performance indicators (KPIs) to improve real-time tracking and policy learning, so Nigeria need to develop a unified digital dashboard for monitoring PPP project performance across all sectors.

7. Research Methodology

This study adopts a mixed-method research design—integrating both quantitative and qualitative approaches. This approach was considered appropriate to provide a comprehensive analysis of the effectiveness of development finance and Public-Private Partnerships (PPPs) in addressing Nigeria's infrastructure challenges. Quantitative data allows for statistical analysis of financing trends and infrastructure performance indicators, while qualitative insights offer contextual understanding through expert opinions and stakeholder experiences.The population of this study

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comprises key stakeholders in the infrastructure and finance sectors in Nigeria, including: Officials from relevant government ministries and regulatory bodies (e.g., Ministry of Finance, Infrastructure Concession Regulatory Commission - ICRC), Representatives from private sector firms involved in PPP projects, Experts in development finance institutions (e.g., AfDB, NSIA), Academics and policy analysts, Civil society organizations monitoring public projects. A purposive sampling technique was employed to select respondents with deep knowledge and involvement in PPP and infrastructure development projects. The estimated sample size was 200 respondents**, i**ncluding: 30 government and regulatory officials, 30 private sector investors and contractors ,20 experts and consultants in development finance, 20 academics and civil society representatives.This approach ensures that data is collected from individuals with relevant practical experience and insight. Primary Data was collected with semi-structured interviews of key stakeholders, while secondary data was collected from existing literature, official reports, PPP project documents, policy briefs, and databases from institutions such as the Central Bank of Nigeria, Federal Ministry of Works, Federal Ministry of Finance, Office of the Accountant General, World Bank, ICRC, NSIA, and the AfDB Transcripts were analyzed using Braun and Clarke's (2006) six step thematic analysis.

8. Data Analysis

8.1. Profile of Respondents

Table 1. Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	124	62
Female	76	38
Total	200	100

Table 2. Age Distribution of Respondents

Age	Frequency	Percentage
18-25	12	6
26-33	28	14
34-41	45	22.5
42-49	40	20
50-57	51	25.5
58 and above	24	12

Total	200	100

The population of this study comprises key stakeholders in the infrastructure and finance sectors in Nigeria, including: Officials from relevant government ministries and regulatory bodies (e.g., Ministry of Finance, Infrastructure Concession Regulatory Commission - ICRC), Representatives from private sector firms involved in PPP projects, Experts in development finance institutions (e.g., AfDB, NSIA), Academics and policy analysts, Civil society organizations monitoring public projects.

Table 3. Sectorial Distribution of Key Stakeholders included in Sample Size

Sector/Place of Work	**Frequency**	**Percentage**
Federal Ministry of Finance	12	6
Federal Ministry of Works and Housing	28	14
Office of the Accountant General Of the Federation.	35	17.5
Infrastructure Concession Regulatory Commission - ICRC	20	10
Representatives from private sector firms involved in PPP projects	30	15
Academics and policy analysts	51	25.5
Civil society organizations monitoring public projects	24	12
Total	200	100

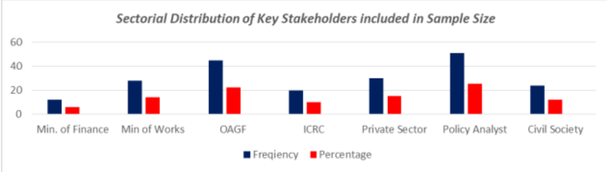

Figure 3: Sectorial Distribution of Key Stakeholders that participated in the study.

8.2. Analysis of Data collected per research questions

8.2.1 What is the current state of infrastructure development in Nigeria and identify the major financing gaps hindering progress?

Table 4. Summary of Respondents Ranking of current state of Sectoral infrastructural Deficit in Nigeria From Highest Deficit to Lowest using percentages, causes and impact on the economy.

Rank	**Sector**	**Estimated % of Total Deficit**	**Estimated $ financing gap**	**Causes**	**Impact**	**Condition**
1	Power &	30%	$10–$15 billion/year	Poor tariff structures &	Major constraint on industrial growth,	Severe

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	Energy			revenue collection. Heavy reliance on government and weak private sector Investment. Limited access to long-term infrastructure financing.	education, healthcare, and daily life.	
2	Transportation	20%	$8–$10 billion/year	Overdependence on road transport with underinvestment in rail and inland waterways. Limited budgetary allocations and delays in public procurement. Weak public-private partnerships (PPPs) due to policy uncertainty.	Increases cost of goods, delays logistics, stifles economic development.	High
3.	Housing	15%	$3.5–$5 billion/year	Low mortgage penetration (less than 1% of GDP). High cost of building materials and land acquisition. Inadequate housing finance systems. Inaccessible or unaffordable housing for low-income earners.	High rent, homelessness, poor living conditions in urban centers.	Substantial.
4	Education Infrastructure	10%	$1.5–$3 billion/year	Chronic underfunding (less than 7% of national budget allocated to education). Inadequate school infrastructure and learning materials. Inefficient fund utilization and monitoring systems.	Poor learning outcomes, low literacy rates, brain drain.	Significant
5	Health	7%	$1–$2.5 billion/year	Underinvestment in healthcare infrastructure, especially in rural areas. Limited insurance coverage and high	High medical tourism, low life expectancy, overwhelmed	High.

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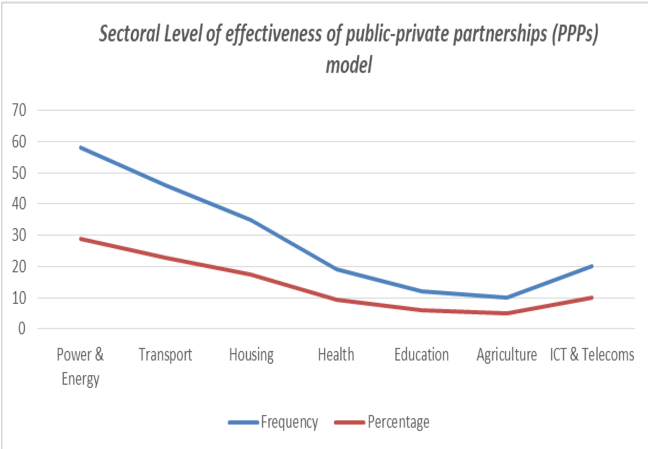
				out-of-pocket spending. Dependence on donor funds with weak sustainability.		
6	ICT	4%	$0.5–$1.5 billion/year	Lack of broadband infrastructure in underserved regions. Limited digital infrastructure in public institutions. Regulatory and policy bottlenecks affecting private investment.	Digital divide, limited access to digital economy opportunities.	Moderate
7	Agriculture	4%	$0.5–$1 billion/year	Inadequate rural road networks, storage, and irrigation systems. Low credit availability to farmers and agribusinesses Weak integration of value chains requiring infrastructure support.	Post-harvest losses, food insecurity, low productivity.	Moderate
Total		**100%**				

Source: Compiled by researcher, 2025.

8.2.2. What has been the sectoral level of effectiveness of public-private partnerships (PPPs) Model for infrastructure development in Nigeria?

Table 5: Sectoral Level of effectiveness of public-private partnerships (PPPs) model for Infrastructure development in Nigeria.

Sector	**Frequency**	**Percentages %**	**Mean Rating of PPP Effectiveness in Nigeria**
Power and Energy Sector	58	29	Moderate
Transport	46	23	Low
Housing Sector	35	17.5	Low
Health Sector	19	9.5	Moderate
Education	12	6	Very Low
Sector			
Agriculture	10	5	Low
ICT and Telecoms	20	10	High
Total	**200**	**100**	



8.2.3 ***What are the key challenges and risks associated with implementing PPPs in the Nigerian context?***

Table 6. ***Sectoral classification of key challenges and risks associated with implementing PPPs in the Nigerian context***

Sector	Key challenges and risks associated with implementing PPP	Mean	SD
Power and Energy Sector	Regulatory and Policy Uncertainty, Electricity tariffs are not fully cost-reflective, discouraging private investment, ineffective bill collection, Weak transmission and distribution.	4.51	.502
Transport	Heavy reliance on federal budget with minimal private funding. Public opposition to tolling and limited federal-state coordination.	4.38	.609
Housing Sector	Land acquisition issues. Limited mortgage access and weak regulatory framework.	4.16	.758
Health Sector	Funding limitations and poor monitoring mechanisms. Minimal private sector interest in rural healthcare PPPs.	4.42	.567
Education Sector	Poor private sector incentives. Lack of coherent policy direction for education PPPs.	4.07.	.796
Agriculture	Low Government Interest Weak agribusiness financing structures. Low capital expenditure on rural infrastructure (roads, storage). Limited risk-sharing mechanisms for investors.	4.18.	.799
ICT and Telecoms	Poor rural connectivity limiting return on investment. Slow fiber optic expansion due to high Right of Way (RoW) charges.	4.21.	.797
	Overall	**4.27**	**.690**

Source: Field Survey, 2024

The data presented in Table 6 reveal an overall mean score of 4.27 (SD = 0.690), indicating a high level of agreement among respondents regarding their awareness of the key challenges and risks associated with the implementation of public-private partnerships (PPPs) across various sectors in Nigeria. The relatively low standard deviation suggests a strong consensus among participants, reinforcing the validity of the observed perception. These findings suggest that while awareness of PPP mechanisms exists, the practical application across sectors remains limited, primarily due to persistent systemic and operational challenges. Respondents identified issues such as regulatory uncertainty, political interference, weak institutional frameworks, and limited risk-sharing mechanisms as major impediments to effective PPP deployment. As a result, PPPs have not been optimally leveraged as instruments for addressing the nation's infrastructure deficit. If these structural and procedural barriers are systematically addressed, PPPs could serve as a viable financing and operational model for accelerating infrastructure development. Enhanced PPP implementation has the potential to not only bridge critical infrastructure gaps but also stimulate economic growth, attract foreign investment, and improve social outcomes such as employment and living standards.

Table 7: *Respondents Rating of General Risks associated with implementing PPPs and blended finance in Nigeria.*

S/N	RISK	Frequency	Percentage Rating of effect on PPP implementation	Ranking of risk
1	Political instability	54	27	Second
2	Corruption	60	30	First
3	Lack of technical capacity	45	22.5	Third
4	Weak regulatory framework	19	9.5	Fourth
5	Poor monitoring	22	11	Fifth

	and evaluation			
	Total	**200**	**100**	

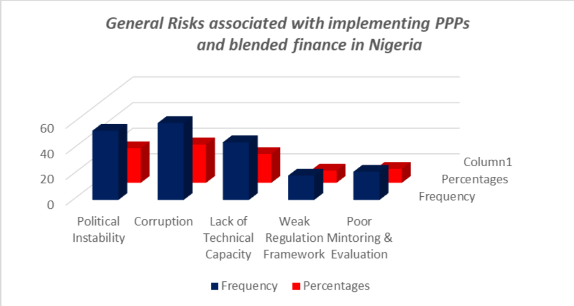


Table 8: *The Strategic implications of adopting PPPs and blended finance mechanisms for Nigeria's long-term economic growth and sustainable development.*

Strategic implications of adopting PPPs in Nigeria	**SA**	**A**	**N**	**D**	**SD**	**Total**
PPPs are imperative to Nigeria's economic development	63	54	10	37	36	200
PPPs helps to reduce the fiscal burden on the Nigerian government.	61	42	15	38	44	200
Risk sharing in PPPs between public and private partners, helps to mitigate the potential risks and encourage private investment in Nigeria	56	58	10	37	39	200
PPPs and blended finance allow the Nigerian government to tap into private sector capital and expertise.	71	65	5	29	30	200
PPPs helps the Nigerian government to strategically channel private investment to priority projects that are aligned to its sustainable development goals.	62	48	17	46	27	200

9. Results and Discussion of Findings

This study underscores the persistent infrastructure financing gaps in Nigeria, which remain a significant constraint to economic development. The deficits are widespread across key sectors—power and energy, transportation, housing, education, health, ICT, and agriculture—with investment needs exceeding $25–$40 billion annually (AfDB, 2022; IMF, 2023). The financing gap is primarily driven by overreliance on volatile public budgets, high debt servicing burdens—with the debt service-to-revenue ratio surpassing 90% in 2023 (MoFI, 2023)—and limited engagement from the private sector.

Development Finance Institutions (DFIs) like the Africa Finance Corporation (AFC) and the Nigeria Sovereign Investment Authority (NSIA), while valuable, operate on an insufficient scale to close the gap (World Bank, 2021). Moreover, innovative financing instruments such as green bonds, diaspora bonds, and blended finance are underutilized despite their proven efficacy in emerging markets (UNCTAD, 2021; OECD, 2022).

The power and energy sector emerged as the most critical area of infrastructural deficit, requiring an estimated $10–$15 billion annually (IEA, 2022). The lack of reliable electricity has significantly hindered industrialization and SMEs, a view echoed by Aliyu et al. (2018), who noted that over 60% of firms in Nigeria rely on generators. The transportation sector is similarly deficient, with the country overly dependent on poorly maintained road networks, resulting in high logistics costs and supply chain inefficiencies (Adeleke et al., 2020). The housing sector, with a deficit of over 20 million units, is stifled by low mortgage penetration, rising construction costs, and land acquisition bottlenecks (UN-Habitat, 2020).

The education and health sectors are equally underfunded, requiring $1.5–$3 billion and $1.5–$2.5 billion annually, respectively. These deficits contribute to brain drain, medical tourism, and poor human capital outcomes (Okonjo-Iweala & Osafo-Kwaako, 2021). The ICT sector has moderate deficits, particularly in rural connectivity, which hinders the adoption of digital platforms and limits economic inclusion (GSMA, 2023). In agriculture, infrastructure gaps manifest in poor rural roads, limited storage facilities, and insufficient access to credit, requiring up to $1 billion annually (FAO, 2021).

While Public-Private Partnerships (PPPs) have shown isolated successes—e.g., the MM2 Airport Terminal and Apapa Port Concession—structural weaknesses persist. These include cost overruns, value-for-money concerns, public opposition, and unclear risk-sharing frameworks (Akinyelure & Ogunlana, 2019).

PPP implementation in power is constrained by regulatory uncertainty, non-cost-reflective tariffs, weak transmission systems, and poor billing and collection mechanisms (Obi et al., 2022). These challenges disincentivize private sector investment, exacerbating the sector's fragility.

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In the transportation sector, public resistance to tolling—particularly as seen in the Lekki-Epe Expressway—combined with fragmented coordination between federal and state authorities, impairs PPP outcomes (Nnadozie & Ogbuehi, 2021).

The implementation of PPP in Nigerian Housing Sector is confronted with barriers including land tenure complications, limited access to long-term mortgages, and a weak regulatory environment (Onyebueke & Gana, 2020). These limit scalability of private sector participation in affordable housing delivery.

PPP in healthcare is nascent, with minimal private sector interest, particularly in rural health infrastructure due to low returns on investment and insurance penetration (Uzochukwu et al., 2020). In Education Sector, Lack of a coherent national PPP policy for education, coupled with weak incentives for private investors, has curtailed progress in this sector (Ige, 2021).

The agriculture sector is facing the challenges include weak agribusiness financing structures, limited government commitment, and ineffective risk-sharing (Olomola, 2021). PPP challenges in ICT stem from poor rural connectivity and low returns on investment, discouraging infrastructure development outside urban centers (GSMA, 2023).

A major insight from the study is that corruption is the most significant perceived risk in implementing PPPs in Nigeria. This aligns with findings from Transparency International (2022) and Ampratwum (2008), which link corruption to inefficiencies in public procurement and project execution. Political instability, lack of technical expertise, regulatory ambiguity, and weak monitoring and evaluation mechanisms further compound these risks.

Nonetheless, the majority of respondents maintained that PPPs are vital for Nigeria's economic development, especially as they help to reduce fiscal pressures on government, leverage private capital, and align private sector investments with Sustainable Development Goals (SDGs) (UNESCAP, 2022; AfDB, 2023). Similar sentiments are expressed in empirical studies by Yescombe (2017) and Grimsey & Lewis (2004), who argue that PPPs can bridge funding gaps if well-structured and transparently managed.

10. Conclusion

This study provides a comprehensive evaluation of Nigeria's infrastructure landscape, exploring the persistent financing gaps, the evolving role of Public-Private Partnerships (PPPs), and the opportunities for development finance in catalyzing economic transformation. The findings reaffirm that Nigeria faces severe and multifaceted infrastructural deficits across key sectors—including power, transportation, housing, education, health, agriculture, and ICT—requiring an estimated annual investment of \$25–\$40 billion to bridge (AfDB, 2022; IMF, 2023). The inability of public budgets alone to meet these needs—especially in light of a debt service-to-revenue ratio exceeding 90% (MoFI, 2023)—necessitates alternative and innovative approaches to financing infrastructure.

Development Finance Institutions (DFIs), such as the Africa Finance Corporation and the Nigeria Sovereign Investment Authority, play pivotal but insufficient roles due to limited capital, scale, and project pipelines (World Bank, 2021). Moreover, underutilization of blended finance, diaspora bonds, and other innovative instruments remains a missed opportunity for leveraging domestic and international capital (UNCTAD, 2021; OECD, 2022). This calls for deliberate policy reforms and strategic alignment to enhance the efficiency and scalability of these instruments.

The assessment of PPPs revealed a mixed record. While landmark projects like the MM2 Airport Terminal and Apapa Port Concessions have demonstrated the potential of PPPs, numerous sector-specific and systemic challenges undermine broader success. Regulatory uncertainty, weak institutional frameworks, fragmented coordination, and socio-political risks such as public opposition and corruption remain substantial barriers (Akinyelure & Ogunlana, 2019; Transparency International, 2022). Each sector exhibits unique implementation difficulties—ranging from non-cost-reflective tariffs in the power sector (Obi et al., 2022) to rural investment disincentives in health and ICT (Uzochukwu et al., 2020; GSMA, 2023)—which necessitate targeted, context-specific reforms.

Despite these challenges, the strategic potential of PPPs and development finance mechanisms remains significant. Empirical evidence and stakeholder insights converge on the notion that well-structured PPPs reduce fiscal pressure, increase infrastructure investment, and align with Nigeria's Sustainable Development Goals (UNESCAP, 2022; Yescombe, 2017). However, this potential can only be realized within a governance framework that prioritizes transparency, institutional capacity, regulatory coherence, and robust risk-sharing models.

11. Recommendations

Based on the findings and analysis of this study, the following strategic recommendations are proposed to enhance the effectiveness of development finance and Public-Private Partnerships (PPPs) in addressing Nigeria's infrastructure challenges:

i. In Nigeria, there is need for broader reforms and harmonization of laws at federal and state levels to eliminate legal ambiguity, create a robust, transparent, and enforceable legal environment to attract long-term private capital.
ii. The country need to strengthen the autonomy and capacity of regulatory agencies such as the Infrastructure Concession Regulatory Commission (ICRC).
iii. The country need to enhance institutional capacity for project preparation and implementation by investing in institutional and human capacity development through training, technical assistance, and knowledge-sharing partnerships with international PPP units.

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iv. Since many failures in PPP arrangements stem from information asymmetry and poor contract oversight. The country should work with World Bank (2021) recommendation of having a unified digital dashboard for monitoring PPP project performance across all sectors, with key performance indicators (KPIs) to improve real-time tracking and policy learning.

v. The country need to develop a National Infrastructure Master Plan with clear investment Priorities that can serve as a guide for both domestic and foreign investors.

vi. Nigeria need to deepen her money and capital market to promote innovative financing instruments.

vii. The country need to tackle the problem of corruption, poor corporate governance and lack of transparency. There is need to introduce digital monitoring tools, open contracting data standards (OCDS), use of e-procurement systems and proactive disclosure of PPP contracts and citizen feedback mechanisms.

viii. To attract sustained private sector involvement, the government must reduce bureaucratic hurdles, streamline approval processes, and provide predictable policy environments. Risk mitigation tools, including political risk insurance, sovereign guarantees, and viability gap funding, should be scaled up to boost investor confidence.

ix. Given Nigeria's strategic economic position in West Africa, investment in cross-border transport, energy, and digital infrastructure should be prioritized to enhance regional trade, market access, and economic resilience in line with the African Continental Free Trade Area (AfCFTA) objectives.

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