

RESEARCH ARTICLE

Assessment of the Factors affecting the Provision of Building infrastructure under the Public-Private Partnership Housing Scheme

*Ugochi Agatha Asikogu, & Oluwaseun David Ajayi

Department of Building, Imo State University, Owerri, Nigeria

*Corresponding Author's Email: asklin2007@gmail.com, ugochiaskogu@imsuonline.edu.ng

ABSTRACT

The study focused on assessing the factors affecting the provision of infrastructure under the public-private partnership (PPP) housing scheme with a view to ascertaining the factors that play major roles in the affordability of housing infrastructure to residents in Abuja. Presently, there are cases of poor or a lack of adequate infrastructure reported in various estates within the study area. Adequate and affordable housing infrastructure plays an unavoidable role in the well-being of individuals in any society; hence the justification for the study. The research administered eighty (80) copies of the questionnaire to professionals in the building industry, real estate developers, and government agents (FCDA) randomly. Seventy (70) copies of the questionnaire were duly completed and returned. This indicated about an 87.5% return rate in order to assess the factors affecting the provision of housing infrastructure under the public-private partnership (PPP) housing scheme for a more conducive environment for residents. From descriptive statistics, the mean index score showed that high interest on loans was most significant, as it ranked first with a mean index of 4.4286; the government should therefore make provision for soft loans and subsidies for private estate development. Opportunities for mortgage loans should be made accessible to the developers. Strict checks against diversion of the loan to other uses are highly necessary. Insufficient finance, being another key significant factor as it ranked 2nd, should be a thing of concern to the government. Therefore, the government should provide financial support to developers by introducing intervention funds for the provision of infrastructure with long-term loans and low interest rates. The chi-square test was used to test the hypothesis of the study. This indicates a statistically significant variation among the factors affecting the provision of public-private partnership (PPP) housing schemes. The study concluded that the factors do not behave uniformly, meaning that each factor likely has a different level of influence or impact in the context of public-private partnership (PPP) housing provision.

Keywords: *Building infrastructure; PPP; Housing scheme; Nigeria*

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1. INTRODUCTION

Ademiluyi (2010) opined that the advent of Public-Private Partnership in housing in Nigeria started in the early 1990s with the introduction of the National Housing Policy (NHP). Ukwai et al. (2012) maintained that the poor performance of the National Housing Policy in meeting its set goals and objectives resulted in a comprehensive review. In the year 2000 (National Technical Working Group on Housing, 2009), a new approach to the partnership between the government and private sector in providing housing and infrastructure was initiated in the year 2000 (National Technical Working Group on Housing, 2009). Ukoje and Kanu (2014), in their contribution, stated that the partnership between the Federal Capital Territory Administration (FCTA) and the private sector commenced in the year 2000 due to the inability of the government to meet the high demands for housing and its needed infrastructure.

Ibrahim and Kwankur (2012) maintained that the purpose of partnership was to reduce the responsibility of providing housing and infrastructure on the part of the government and increase the participation of the private sector. The FCTA (2008) noted that twenty-seven districts were allocated for the housing scheme under the PPP arrangement between 2000 and 2011.

Rapid growth in population drives up demand for housing and puts pressure on the efficient supply and distribution of essential services such as water, electricity, and sanitation. Ajayi and Omole (2012) maintained that in most urban centers, the challenge of housing is not only restricted to the paucity or inadequate supply but to the poor quality of available housing units. Housing affects the life of an individual as it provides the space for protection, privacy, economic activities, recreation, and livelihood. A habitable dwelling should be one located in a suitable living environment encompassing various aspects that promote physical and mental well-being, comfort, and quality of life, with potable water, adequate shelter, and other infrastructure. Ibrahim and Kwankur (2012) identified access roads, pipe-borne water, drainage, sewer systems, electricity, recreational parks, shopping complexes, and street lights as part of the infrastructure to be provided under the PPP housing scheme. The housing condition of a country is a pointer to the health, motivation, economic well-being, and the social circumstances of its citizens. The growing population witnessed in cities as a result of rapid urbanization and migration leads to increased demand for housing and infrastructure; the need for sustainable and environmentally friendly housing development practices and concerns about social inequality and unequal access to housing opportunities amongst the challenges mitigating government provision of housing and infrastructure gave rise to public-private partnerships. The transfer of part of the project risks to private partners is one of the key benefits generated by public-private partnerships, as it has greatly resulted in better control by the public sector over the project cost, delivery time, and quality standard.

In recent times, the development of cities and their infrastructural needs around the world is achieved through the joint efforts of both the government and private individuals' efforts and initiatives. Nigeria operates a three-tier system of government: the federal government, State government, and local government; all are required to provide affordable and comfortable housing and infrastructure to the people.

However, in developing countries such as Nigeria, poor housing delivery has been attributed to factors such as insufficient mechanisms and systems for land allocation, financial constraints, political instability, mortgage institutions, and infrastructure (Bala and Bustani 2008; Encarta, 2007). According to Ajanlekoko (2001) and Ajayi and Omole (2012), one major part of the urban problem with respect to housing is the poor state of the infrastructure. Thus, the study intends to assess the factors affecting the provision of building infrastructure under the public-private partnership housing scheme in Abuja, Nigeria.

Despite the adoption of Public-Private Partnership (PPP) in housing, the paucity of housing in both quantitative and qualitative terms remains a challenging problem. According to Ibem and Aduwo (2012); Ahmed, Moohammad, and Abubakar (2010); Abdullahi and Abdul-Aziz (2010), some PPP housing projects failed while others were executed successfully. Amongst the reports emerging from across the country reveal that PPP has not been as successful as earlier proposed due to some of the following challenges: housing-related issues (insufficient housing supply, leading to a shortage of affordable housing options; high housing costs, making it difficult for low- and middle-income households to access housing; inadequate housing infrastructure, leading to health and safety concerns). Financial and economic setbacks (insufficient government funding for housing development and maintenance; rising construction costs, making it challenging for private developers to provide affordable housing; difficulty in managing risks associated with housing development, such as market fluctuations and regulatory changes). Other challenges include: difficulty in acquiring land for housing development, due to various reasons such as high costs, regulatory issues, or community resistance; inadequate infrastructure, such as roads, water, and sanitation facilities, to support housing development.

The permutations in these factors, integrated with the lack of research on PPP in Abuja, led to the motivation for this study, which aims at assessing the factors affecting the provision of building infrastructure under the Public-Private Partnership housing scheme in Abuja with a view to enhancing the provision of affordable housing scheme (Ogunba et al 2020).

The study assessed the factors affecting the affordability of building infrastructure under the public-private partnership (PPP) housing scheme in Abuja with a view to enhancing the provision of affordable housing.

The Objectives of the Study are set out to:

- i. ascertain the factors that play major roles in the affordability of housing infrastructure to residents in Abuja.
- ii. assess the factors affecting the provision of building infrastructure under the public private partnership (PPP) housing scheme in Abuja.

2. LITERATURE REVIEW

Infrastructure is widely defined as the system of services and facilities which provides for the basic wellbeing and quality of life (Ziara and Ayyub, 1996). The Longman online dictionary (2014) defines infrastructure as the basic systems and structures that a country or organization needs in order to work properly, for example, roads, railways, banks, etc. According to Boyle (2024), infrastructure is defined as the basic physical systems of a business, region, or nation and often involves the production of public goods or production processes. Examples of infrastructure include transportation systems, communication networks, sewage, water, and school systems. Investments in infrastructure tend to be costly and capital-intensive, but vital to a region's economic development and prosperity. Projects related to infrastructure improvements may be funded publicly, privately, or through public-private partnerships.

Ziara and Ayyub (1996) further described infrastructure as facilities and basic systems on which the sustainability and growth of a community and state depend. The term typically refers to the technical structures that support a society, such as roads, water supply, sewers, electrical national grids, telecommunications, and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" (Fulmer, 2009).

The major features in the above definition of infrastructure consist of facilities and utilities that are provided for the public to enhance the living standards of the people. Urban facilities are the required public facilities for upholding people's lifestyle

and city functions and refer to the framework for urban structure (Japan, 2004; Zakout, 2006). These may include transportation facilities such as roads and park lots, public spaces such as parks, green spaces and public squares, supply facilities such as water and electricity, waste disposal facilities such as sewers, waste treatment plants and garbage incinerators, educational and cultural facilities such as schools, libraries and research facilities, and medical and social welfare facilities such as hospitals and child care centers (Japan, 2004; Zakout, 2006). Infrastructure is a very important aspect of housing development as it provides a conducive environment for inhabitants to live comfortably. Amis and Kumar (2000) asserted that it is easier for individuals to cope with different levels of poverty due to the existence of infrastructure. It also follows that cities with the greatest number of poor people are those whose citizens lack infrastructure the most (Udoka, 2013).

Kumar (2005) classified infrastructure into two types, soft and hard infrastructure. Soft infrastructure refers to all the institutions that are required to maintain the economic, health, cultural, and social standards of a country, such as the financial system, the education system, the health system, the governance system, and the judiciary system, as well as security, while hard infrastructure refers to the large physical networks necessary for the functioning of a modern industrial nation.

The term infrastructure first appeared in the late 1880s, derived from French, with *infra-* meaning below and *structure* meaning building. Infrastructure can mean the foundation upon which the structure of an economy is built. Infrastructure powers businesses and connects workers to their jobs and citizens to opportunities for healthcare and education. It creates opportunities within communities, and an economy needs reliable infrastructure to connect supply chains and move goods and services.

Infrastructure includes a variety of systems and structures where physical components are required, such as the electrical grid across a city, state, or country. While the facilities, equipment, or similar physical assets like bridges and roads are essential to an economy, infrastructure also enables citizens to participate in the social and economic community and provides them with necessities such as food and water. Because infrastructure often involves the production of either public goods or goods that lend themselves to production, it is typical to see public financing, control, supervision, or regulation of infrastructure.

Portugal- Perez and Wilson (2012), in their contribution, categorized infrastructure as hard or soft. Hard infrastructure is the tangible physical system needed to run a modern, industrialized nation. Examples include roads, highways, tunnels, railways, and bridges, as well as the assets required to make them operational, such as transit buses, vehicles, and oil refineries. Technical systems such as networking equipment and cabling are considered hard infrastructure and provide a critical function to support business operations. According to the Brookings Institution, 16.6 million people have jobs in fields directly related to infrastructure. From locomotive engineers and electrical power line installers to truck drivers and construction labourers, infrastructure jobs account for nearly 11.8% of the nation's workforce (Portugal- Perez & Wilson, 2012). Soft infrastructure is the services required to maintain the economic, health, and social needs of a population. It represents human capital and institutions necessary to maintain an economy that delivers certain services to the population, such as healthcare, financial institutions, government offices, law enforcement, and education. Investments in soft infrastructure target how people thrive and participate in daily life. This could further be categorized into several types:

Transportation: roads, highways, bridges, airports, seaports, and public transportation systems.

Energy: power plants, transmission lines, distribution networks, and renewable energy sources.

Water and Sanitation: water treatment plants, pipelines, sewage systems, and wastewater treatment facilities.

Communication: telephone networks, internet infrastructure, and broadcasting systems.

Education: schools, universities, and other educational institutions.

Healthcare: hospitals, clinics, and other healthcare facilities.

Social Services: community centers, social welfare organizations, and public housing.

Financial Systems: banks, stock exchanges, and other financial institutions.

Industrial Parks: manufacturing facilities, logistics centers, and other industrial infrastructure.

Agricultural Infrastructure: irrigation systems, farm-to-market roads, and other agricultural support facilities.

Infrastructure plays a Critical Role in: supporting economic growth and development; enhancing quality of life and public health; facilitating communication and transportation; promoting social welfare and community development; ensuring environmental sustainability and resilience.

Public– private partnership in housing in Nigeria

The Council for Public-Private Partnership (2003) in Canada defines PPP as a „cooperative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards“. Public-Private Partnership (PPP) may also be defined as a contractual agreement between the government and the private sector for the delivery of goods and services normally provided by the government, with both parties sharing in the risks and rewards inherent in the delivery of the goods or services, which include financial risks and responsibilities (World Bank, 2015). In simple terms, public-private partnership means the cooperation of the government and the private sector where each party contributes its quota to the delivery of goods and services.

In housing provision, PPP has gained currency in recent times on the premise that it promotes multi-stakeholder participation; enhances productivity of the public- sector housing and reduces housing affordability challenges (UN-HABITAT, 2006; Shelter Afrique, 2008). Based on the agreement, PPP in housing, according to the enablement, the private sector plays the role of physical construction, funding, implementation, and, in some cases, the management of the disposal. Government's role on the other hand, is to set the goals, supervision and monitoring, standardization and provision of legal, institutional, economic policy frameworks (Abdullahi and Aziz 2010; Sengupta, 2007 & Tipple; Tecco, 2008; Akintoye et al., (2006) observed that the delivery of adequate housing through PPP with a functioning housing market is more effective than through public agencies or non-profit non-governmental agencies.

According to Sengupta (2006), in developing countries, PPP in housing is still emerging, and its utilization is dependent on the economic strength, dominant political environment, and housing tradition of a particular city. In Africa, cities are growing at an exceptional rate, and there is rising pressure on governments to house the people and provide infrastructure facilities, but in large part governments are unable to match demand with concurrent provision of adequate housing and infrastructure (Ajanlekoko, 2001; Ukoje and Kanu, 2014). The need for PPP in housing became necessary due to the inability of the government to meet the rising demand for housing caused by rapid urbanization in cities. The principal motive for the government's formulation of housing programmes and policies is to improve existing housing conditions of the people, thereby enhancing the quality of life.

The involvement of the private sector in the provision of housing in Nigeria dates back to the early 1990s, when it was introduced in the 1991 National Housing Policy (NHP) (Ukoje and Kanu, 2014). The government embarked on a plan that entailed encouraging direct public housing provision and simultaneous stimulation of the private sector housing to improve housing delivery (Abdullahi and Aziz, 2010). The private sector was encouraged to play a more effective role in housing provision while the government intervened through direct public housing provision. A more market-driven strategy was adopted in the year 2000 in housing delivery and infrastructure development in Nigeria, stressing its role as that of an enabler and regulator, rather than a provider (Ukoje and Kanu, 2014).

The Concept of Public-Private Partnership Housing in Abuja

Mabogunje (2001) encouraged the government to encourage the development of OPS and made land available to this class of developers in the city. The Federal Capital Territory Administration (FCTA) and the Federal Capital Development Authority (FCDA) decided in the year 2000 to embark on a new approach in order to meet the challenges. The Mass Housing Scheme (MHS) was introduced with more emphasis on creating the enabling environment for the private sector to participate more actively. It aimed to reduce the disparity that existed between supply and demand of housing stock within the City of Abuja and its environs (Ibrahim & Kwankur, 2012). The private real estate developers were allocated parcels of land within Abuja to develop housing estates. At the beginning, the land allocation was made to the OPS developers at no cost, apart from the little processing fee paid, as a government equity contribution to the scheme. They are, however, not issued with a formal Right of Occupancy letter, which is the standard practice, but a „Letter of Intent“. This allows them to source funds from any financial institution to enable them to carry out their development.

Factors affecting the Provision of Housing and infrastructure under the Public Private Partnership arrangement in Abuja

Public-private partnership in the provision of housing and infrastructure has yielded success in developed countries with active participation from the government and the organized private sector. In developing countries, the inability of the public sector to meet the increasing demands of housing and infrastructure has also led to the participation of the organized private sector (Kihato, 2009). African countries during the past several years have begun to significantly revamp their housing policies to support a much greater role for the private sector in housing construction (Giddings, 2007). The success of the partnership depends greatly on the participation of both parties. The challenges are given below:

The government's poor participation is one of the challenges facing this arrangement; the partnership between the government and the organized private sector actively started in the year 2000 (Ibrahim & Kwankur, 2012). According to Abdullahi and Aziz (2010), part of the hindrance experienced in the course of implementation was the inability of the government to fulfil its agreement to provide the primary infrastructure due to funding constraints. It was further noted that many plots in districts allocated under the PPP arrangement for more than ten years are without infrastructure. Ibrahim and Kwankur (2012) stated that the government did not keep to its own side of the bargain by failing to provide primary infrastructure to most of this district as agreed in the development lease agreement signed by the two parties. This clearly demonstrates half-hearted commitment by the Government and may be responsible for the low rate of mobilization and development by the private partners within that section of the mass housing sites (Ukoje and Kanu, 2014).

According to Ibrahim and Kwankur (2012), the issue of delay in detailed land use, detailed engineering design, and site development plan by the development control department in districts brought about poor performance. As earlier stated, the PPP arrangement in Abuja commenced in the year 2000. Ukoje and Kanu (2014) opined that a well –structured policy guideline, which was to guide development, was not ready until 2009, long after the program commenced. Since there were no plans and standards to adhere to, it led to serious violations of the master plan. Ibrahim and Kwankur (2012) maintained that developers were obligated to submit details of their intended design drawings to the development control department for vetting, approval, and final issuance of a development permit. On the other hand, the development control department is expected to vet drawings and grant setting-out approvals on site before any developer could commence real development. According to Giddings (2007), lack of proper financing and an operational means to provide basic infrastructure to potentially well-located sites, to create serviced sites for housing construction, and to upgrade slum areas was a major limitation to providing decent, affordable housing, almost generally recognized by both the public and the private sectors.

Funding, as one of the most important factors in inadequate infrastructure provision, has become a major hindrance to infrastructural and other project development in Nigeria for decades (Odenyinka and Yusuf, 1997; Ayodele and Alabi, 2011; Alokun, 2008; Ihuah and Benebo, 2014). In situations where there was an opportunity for a mortgage loan, only a few developers accessed the loan. Some diverted the loan to other uses, and others could not service the loan. Ukoje and Kanu (2014), in their contribution, maintained that the majority of the developers find it difficult to access loans due to high interest rates and other stiff requirements that the loan attracts. For many banks, building societies, and mortgage companies, the discrepancy between the short-term nature of their deposits and the longer-term nature of mortgage lending, in addition to the unavailability of longer-term sources of finance, remains a limitation (Giddings, 2007)

Ukoje and Kanu (2014) asserted that the decisions were made as the need for it arose, and the committee originally saddled with the responsibility of monitoring the OPS construction work was ineffective. The development lease agreement that the developers were made to sign before the beginning of the project was completely abandoned and disregarded, which normally should have acted as a guide, standardizer, and moderator of the projects between the parties to the contract (Abdullahi and Aziz, 2010).

In selecting an appropriate site for the development of any building project or for construction purposes, there are many issues worthy of careful consideration. The costs of site preparation are the first phase of any major construction project. The process involves clearing the land of trees and debris, leveling the ground for building, and moving materials to and from the site. Site survey, site clearing, and soil analysis have been outlined as the steps involved in site preparation of a building construction project, which also has financial implications. Site survey also takes time and money. Other processes before construction are site clearing, soil analysis/ site investigation, and providing utilities to the site. In many Nigerian communities, the building of a house is preceded by a foundation stone laying ceremony and customary rites. There is also the youth development levy that is paid to the community before any site work is allowed. Consultancy fees, statutory fees, and customary rites all add up to the cost of construction.

The final cost of housing development is dependent on the cost of materials and construction, meaning the higher the costs, the higher the cost of purchase of housing units and vice versa (Ajanlekoko, 2001). Cost of Materials includes the cost of materials needed to build the project and the cost of labour. Material price is subject to demand and supply. It is affected by many other factors, including quality, quantity, time, place of purchase, buyer and seller, current exchange rate, low or high demand, material specification, and High cost of transportation. This is attributed to the high standards and technologies which are mostly imported. It is beneficial to bear in mind that the contractor's profit and overhead must be added to the materials and labour costs. Most of the buildings constructed by developers focus on medium and high costs, leaving very few units, or none, for low-income earners (Abdullahi and Aziz, 2010).

The final cost of housing and infrastructure development is dependent on the cost of materials and construction, meaning the higher these costs, the higher the cost of purchase of housing units (Ukoje and Kanu, 2014). Akeju (2007) stated that infrastructure accounts for thirty percent of housing cost; this has caused the low provision of infrastructure for housing by developers.

The PPP housing scheme has witnessed changes in policies as regards the provision of housing and infrastructure (Abdullahi and Aziz, 2010). These policies include the change of land use, finance mechanisms, and incentives in the cost of building materials.

As part of the guidelines to control the development of infrastructure in estates, the FCTA provides detailed site development plans (Ibrahim and Kwankur, 2012). Abdullahi and Aziz (2010) stated that most of the detailed land use and development plans weren't ready from the inception of the scheme before developers moved to site and started construction. This resulted in demolition due to changes in land use and obstruction.

Ibem et al. (2011) stated that the high cost of providing infrastructure in housing estates has affected the affordability of houses. Leadership News (2015) reported that houses with adequate infrastructure in Abuja stay on the market for a long time due to the high price attached to them, and developers fear that their investment won't yield the expected interest.

Kihato (2009) identified the rapid growth of population in urban areas in Africa as one of the factors affecting the provision of housing infrastructure by the government and the private sector. The population of Abuja has been growing steadily over the years, as several censuses have revealed. In the 1991 and 2006 National Population Commission (NPC) censuses, the population of the FCT of Abuja was estimated to be 378,671 and 1,406,239, respectively (Abdullahi and Aziz, 2010).

Umoh (2012) opined that the PPP housing scheme has not been successful in terms of the quality and quantity of housing and infrastructure provided. The FCTA (2008) noted that the Development Control Department had to embark on demolishing many houses and instructed the reconstruction of infrastructure due to poor coordination, supervision, and workmanship on the side of the developers. In the work of Rufai (2010), it was affirmed that a lack of technical professionals led to low quality of jobs provided in the scheme.

3. MATERIALS AND METHODS

The research area was Abuja, the capital territory of Nigeria. While the information for the study was elicited from the built-environment professionals and officials of the Federal Capital Development Authority. A survey design was used with a random sampling technique. A total of eighty (80) copies of questionnaires were distributed, of which seventy (70) were duly filled and returned. This represented a response rate of 87.5%. Therefore, the sample size for the analysis was 70. The data were presented in Tables and percentages, while Mean score and chi-square tests through SPSS were used to analyze the data.

Table 1. The Composition of Respondents

S/N	Area of Specialization/ designation	Frequency	Percentage
i.	Architect	18	25.71%
ii	Builder	27	38.57%
iii.	Quantity survey	4	5.71%
iv.	Engineer	13	18.57%
v.	Estate Developer	3	3.30%
vi.	FCDA Officer	5	7.1%
	Total	70	100

From Table 1 above, 27 respondents, making 38.57% of the respondents, were builders, while 18, making 25.71%, were architects. 13 of them were engineers, making 18.57%. While FCDA officers were 5 in number, making 7.10%. 4 of the respondents, making 5.71%, were Quantity surveyors. Estate developers were 3 in number, making 3.30%. Also, the majority, 42 (60%), of respondents have HND/BSc degrees, while 28 (40%) have MSc or higher qualifications. This distribution reflects a highly educated sample, which is likely to influence their perspectives on infrastructure and housing. In summary, the majority of the respondents (44.30%) have 16-20 years of experience, indicating that most respondents possess substantial professional experience.

4. RESULTS AND DISCUSSION

Table 2. The Factors Affecting the Provision of Infrastructure under the Public-Private Partnership Housing Scheme

S/N	FACTORS	5 SA	4 A	3 N	2 D	1 SD	Total	Mean Index	Rank
i.	Inability of the government to provide primary infrastructure.	26	20	11	3	10	70	3.70	11
ii	Increasing demands due to rapid urbanization	39	17	1	5	8	70	4.0571	4
iii	Poor planning and execution strategies by developers.	30	22	5	11	2	70	3.9571	8
iv	Insufficient finance	31	36	0	0	3	70	4.3143	2
v.	High Interest on loans	42	21	4	1	2	70	4.4286	1
vi	Inconsistency in government policies	45	2	4	16	3	70	4.00	6
vii	Delayed detailed land use and site development plans	25	27	1	13	4	70	3.80	10
viii	High cost of building materials.	14	30	18	7	1	70	3.70	11
ix	Lack of technical professionals	22	32	13	1	2	70	4.0143	5
x.	Delays from subcontractors	14	20	9	18	9	70	3.1714	15
xi	High cost of construction	35	24	2	5	4	70	4.1571	3
xii	Risk of low returns on investment	24	28	11	6	1	70	3.9714	7
xiii	High infrastructure standards.	11	34	14	9	2	70	3.6143	14
xiv	Complexity of construction works	14	18	11	18	9	70	3.1429	16
vx	Negative effect on the affordability of the houses	10	46	0	7	7	70	3.6429	13
vix	Political factor/inconsistent government	32	21	4	8	5	70	3.9571	8

SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree

From Table 2 above, presenting the factors affecting the provision of infrastructure under the public-private partnership housing scheme, the study concluded that the high interest on loans is most significant, as it ranked first with a mean index of 1 and a mean score of 4.4286; this was followed by insufficient finance, which ranked 2 with a mean score of 4.3143. High cost of construction ranked 3 with a mean score of 4.1571. However, Complexity of construction works has the lowest mean index of 3.1429.

Testing of Hypothesis

H₀₁: Factors Affecting the Provision of PPP Housing Scheme do not vary significantly among themselves.

To test this hypothesis, a Chi-Square test was conducted to evaluate the variability among the factors affecting the provision of Public-Private Partnership (PPP) housing schemes. The results from the analysis are presented in the table above.

Table 3. Chi-Square Tests

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	219.013 ^a	45	.000
Likelihood Ratio	240.442	45	.000
Linear-by-Linear Association	16.059	1	.000
N of Valid Cases	1012		
a. 16 cells (25.0%) have expected count less than 5. The minimum expected count is 3.70.			

Pearson Chi-Square statistic: 219.013 with 45 degrees of freedom, p-value = 0.000.

Likelihood Ratio Chi-Square statistic: 240.442 with 45 degrees of freedom, p-value = 0.000. Linear-by-Linear Association statistic: 16.059 with 1 degree of freedom, p-value = 0.000

The p-values obtained from the Pearson Chi-Square, Likelihood Ratio, and Linear-by-Linear Association tests are all well below the significance threshold of 0.05. This indicates a statistically significant variation among the factors affecting the provision of PPP housing schemes. Specifically, these results demonstrate that the factors do not behave uniformly, meaning that each factor likely has a different level of influence or importance in the context of PPP housing provision.

The Chi-Square tests confirm that there is a significant relationship among these factors, leading to the rejection of the null hypothesis, which proposed that these factors do not vary significantly.

The analysis shows that the factors affecting the provision of PPP housing schemes vary significantly, implying that each factor plays a distinct and important role in influencing the overall outcome of the PPP housing initiatives. Therefore, the null hypothesis—that these factors do not vary significantly—is rejected. Factors affecting the provision of the PPP housing scheme do vary significantly among themselves.

The Crosstabulation in Table 4 shows the distribution of responses (Strongly Agree, Agree, Disagree, and Strongly Disagree) for each factor affecting the provision of Public-Private Partnership (PPP) housing schemes. This Table is used to understand how different factors are perceived and whether there is a pattern in the responses.

Table 4: Class * Factor Crosstabulation

		Factor				Total
		SA	A	D	SD	
Inability of Government to provide primary infrastructure	Count	26	20	3	10	59
	Expected Count	24.1	23.2	7.5	4.2	59.0
Increasing demands due to rapid urbanization	Count	39	17	5	8	69
	Expected Count	28.2	27.1	8.7	4.9	69.0
Poor planning and execution strategies by developers	Count	30	22	11	2	65
	Expected Count	26.6	25.6	8.2	4.6	65.0
Insufficient finance	Count	31	36	0	3	70
	Expected Count	28.6	27.5	8.9	5.0	70.0
High Interest on loans	Count	42	21	1	2	66
	Expected Count	27.0	26.0	8.3	4.7	66.0
Inconsistency in government policies	Count	45	2	16	3	66
	Expected Count	27.0	26.0	8.3	4.7	66.0
Delayed detailed land use and site development plans	Count	25	27	13	4	69
	Expected Count	28.2	27.1	8.7	4.9	69.0
High cost of building materials.	Count	14	30	7	1	52
	Expected Count	21.3	20.5	6.6	3.7	52.0
Lack of technical professionals	Count	22	32	1	2	57
	Expected Count	23.3	22.4	7.2	4.1	57.0
Delays from subcontractors	Count	14	20	18	9	61
	Expected Count	25.0	24.0	7.7	4.3	61.0
High cost of construction	Count	35	24	5	4	68
	Expected Count	27.8	26.7	8.6	4.8	68.0
Risk of low returns on investment	Count	24	28	6	1	59
	Expected Count	24.1	23.2	7.5	4.2	59.0
High infrastructure standards	Count	11	34	9	2	56
	Expected Count	22.9	22.0	7.1	4.0	56.0
Complexity of construction works	Count	14	18	18	9	59
	Expected Count	24.1	23.2	7.5	4.2	59.0
Negative effect on the affordability of the houses	Count	10	46	7	7	70
	Expected Count	28.6	27.5	8.9	5.0	70.0
Political factor/inconsistent government	Count	32	21	8	5	66
	Expected Count	27.0	26.0	8.3	4.7	66.0
Total	Count	414	398	128	72	1012
	Expected Count	414.0	398.0	128.0	72.0	1012.0

Discussion of findings

The crosstabulation analysis further highlights that respondents perceive certain factors as more critical than others, with notable agreement on issues like high interest rates on loans and inconsistency in government policies. This suggests that policymakers and stakeholders need to prioritize these key factors when formulating policies and strategies to improve the provision of affordable housing through Public-Private Partnership (PPP).

In summary, the findings emphasize the importance of a nuanced, multifaceted approach to tackling the diverse challenges in public-private partnership (PPP) housing schemes, ensuring that each significant factor is adequately addressed to enhance the overall success and sustainability of these projects.

The study concluded that the high interest on loans is most significant, as it ranked first with a mean index of 1 and a mean score of 4.4286; this was followed by insufficient finance, which ranked 2 with a mean score of 4.3143. High cost of construction ranked 3 with a mean score of 4.1571. However, Complexity of construction works had the lowest mean index of 3.1429. The p-values obtained from the Pearson Chi-Square, Likelihood Ratio, and Linear-by-Linear Association tests are all well below the significance threshold of 0.05. This indicates a statistically significant variation among the factors affecting the provision of PPP housing schemes. Specifically, these results demonstrate that the factors do not behave uniformly, meaning that each factor likely has a different level of influence or importance in the context of PPP housing provision. The Chi-Square tests confirm that there is a significant relationship among these factors, leading to the rejection of the null hypothesis, which proposed that these factors do not vary significantly.

5. CONCLUSION

To stem high interest on loans and insufficient finance, the government should make provision for soft loans and subsidies for private estate development. The government should actively participate in the provision of primary infrastructure through the FCTA/FCDA in districts, while private estate developers are responsible for the provision of secondary infrastructure in public-private partnership (PPP) housing estates. Also, regulatory and policy reforms will go a long way to mitigate the impact of the factors affecting the provision of building infrastructure under the public-private partnership housing scheme. In light of the research findings, this study makes the following recommendations:

- i. Since high interest on loans is most significant, as it ranked first with a mean index of 1 with a mean score of 4.4286, Opportunities for mortgage loans should be made accessible to the developers. Strict checks against diversion of the loan to other uses are highly necessary
- ii. Insufficient finance, being another key significant factor, should be a thing of concern to the government. Therefore, the government should provide financial support to developers by introducing intervention funds for the provision of infrastructure with long-term loans and low interest rates.
- iii. The government should foster public-private partnership (PPP) housing estates to leverage resources, expertise, and funding from both sectors to deliver affordable and sustainable housing solutions.
- iv. The government should show full commitment to improving the rate of mobilization and development by the private partners within that section of the mass housing sites, as stated by Ukoje and Kanu (2014).

6. COMPETING INTERESTS

None to declare.

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