The Provision of Infrastructure in Public Private Partnership Housing Estates by Private Estate Developers in Abuja

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Abstract
Infrastructure plays a vital role in housing development hence should be given much attention. The wellbeing of individuals in any community depends on the availability of basic infrastructure to support housing. Abuja as the capital of Nigeria is experiencing rapid population growth which has led to high demands in housing and infrastructure. The government went into partnership with estate developers in the provision of housing and infrastructure to the teeming population. The housing estates provided under this partnership suffer poor provision of infrastructure as cases of disputes between subscribers and developers have been recorded. The purpose of this study is to investigate the level of compliance of estate developers in the provision of infrastructure in public private partnership housing estates. It aims at identifying the basic infrastructure lacking in these estates as it would help relevant bodies play their roles efficiently in the provision of primary infrastructure and also ensure developers adhere to the agreement of partnership. A sample size of 56 estates was selected, a checklist was used for this purpose. From the findings, 75% have paved access roads, 10.4% have water supply, 79.2% have drainages, 83.3% have street lights, 0% have sewer lines, 95.83% have electricity, 14.6% have shopping facility and 29.2% have recreational parks provided by the developers in the housing estates visited. In conclusion, there is poor provision of water supply, sewer lines, shopping facility and recreational parks in public private partnership housing estates. It is recommended that regulatory bodies ensure developers provide the required infrastructure through proper monitoring and supervision.

Keywords: developers, housing, infrastructure, estates, public private partnership

INTRODUCTION
Infrastructure provision forms an important ingredient to housing development and formal housing supply is dependent on relevant authorities delivering sufficient infrastructure (Kihato, 2012). Urban infrastructure and housing provision are interwoven. Without infrastructures, housing cannot be sustainable and hence should be treated integrally (Otegbulu and Adewumi, 2009. One major aspect of urban problem with respect to housing is the poor state of the infrastructures (Ajanlekoko, 2001; Ajayi and Omole, 2012). Giddings (2007), observed that one of the most serious policy constraints to scaling up investments in housing and urban infrastructure in Africa is that in most countries in the region the sector is not accorded the priority it should command in national planning strategies and therefore receives short shrift in attracting budgetary resources.

In recent times, the development of cities and its infrastructural needs around the world is achieved by joint efforts of both the government and private individual efforts and initiatives. Nigeria operates a three tier system of government; the federal government, State government and local government, all required to provide affordable and comfortable housing and infrastructures to the people. Most rural communities suffer insufficient infrastructures and the existing infrastructures are deteriorating rapidly due to the pressure it suffers. These have also led to mass movement of people from rural areas in search of a better life. Government has embarked on mass housing schemes to cater for the ever growing demand of housing but only a little percentage has been achieved. This could be attributed to the fact that most government housing programs have been frustrated by corruption, politicization, insufficiency of technical staff at building sites, and lack of infrastructure (Ademiluyi, 2010).

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. Private Public Partnership (PPP) concept was initiated to reduce the burden of providing housing and its needed infrastructures on the government and increase the participation of the private sector. Government provided parcels to private estate developers to housing estates. The developer enters into a ‘Development Lease Agreement’ with the FCTA/FCDA. This agreement states the term and conditions as well as the obligations of each of the two partners. According to Ibrahim and Kwankur (2012), some the terms and conditions include on the part of the Authority: - The provision of Primary
Infrastructure like, major road arterials, Power supply from the main grid line, Water supply from the main trunk line and Major sewer line connection. While on the part of the Developer they are expected to provide the Secondary Infrastructure like, Secondary roads and local streets within the estate, drainages and sewer lines, power supply to the individual units of house, local facilities for shopping and recreational activities. Cases of poor provision of infrastructure in estates provided under this partnership have been reported by house owners and residents. There was a publication on the internet by Code Wit news dated 7 December, 2013 reporting a dispute between a private estate developer and residents of Abuja Jubilation Bethel Estate, Lokogoma, Abuja as regards the inability of the estate developer to provide the required infrastructure in the estate.

Cases of poor provision of infrastructure in estates have been reported by house owners and residents. There was a publication on the internet by Code Wit news dated 7 December, 2013 reporting a dispute between a private estate developer and residents of Abuja Jubilation Bethel Estate, Lokogoma, Abuja as regards the inability of the estate developer to provide the required infrastructure in the estate. Houses in public private partnership estates at Abuja remain unoccupied due to lack of infrastructure provision needed to ensure a comfortable and healthy environment.

This study intends to ascertain the compliance of developers as regards the provision of infrastructure agreed between the government and estate developers with a view proffer recommendation towards the provision of infrastructure in PPP housing estates.

**LITERATURE REVIEW**

**Infrastructure**

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. Infrastructure can be described generally as the set of interconnected structural elements that provide framework supporting an entire structure of development. Ziara and Ayyub (1996), further described infrastructure as facilities and basic systems on which the sustainability and growth of a community and state depends. 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 consists of facilities and utilities which are provided for the public to enhance living standards of the people. As the population of any society grows, the existing infrastructure suffers deterioration due to high demands.

Urban facilities are the necessary public facilities for maintaining people's lifestyle and city functions and refer to the framework for urban structure which 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 centres (Japan, 2004; Zakout 2006). Infrastructure is a very important aspect of housing development as it provides a conducive environment for inhabitants to live comfortably. Researchers have linked poverty to the deprivation of infrastructures, in essence any society that lacks basic infrastructure is impoverished. 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 infrastructure refers to all the institutions which are required to maintain the economic, health, and cultural and social standards of a country, such as the financial system, the education system, the health system, the governance system, and judiciary system, as well as security while the hard infrastructure Hard refers to the large physical networks necessary for the functioning of a modern industrial nation.

**Categories and Components of Infrastructure**

Zakout (2006), stated that infrastructure is important to attain adequate housing and good quality of life for individuals especially in the construction of low cost housing and therefore urban infrastructure should be classified into two main categories, namely:

i. **Basic Infrastructure Components**

ii. **Supportive Infrastructure Components**

**Basic Infrastructure Components**

The basic infrastructure components are defined as the key infrastructure components which are considered as a basic requirement for the basic life, health, safety and security of people. The provision of infrastructure which fall under this category should be provided simultaneously with the construction of houses and their costs added to the cost of housing. The provision of this infrastructure is the
responsibility of the housing institution (owner/developer) in cooperation and coordination with the relevant national ministries and authorities. The basic infrastructure components are as follows: water supply, wastewater collection (sewerage system), wastewater treatment and reuse or disposal, power supply and security lighting, access and paving, storm water drainage and telephone lines.

Supportive Infrastructure Components
This category of infrastructure includes all services which are considered to be supportive to the lives of the residents, but not necessary essential for their basic wellbeing. The provision of supportive infrastructure services within an estate or community is to provide proximity to services and facilitate the social life of residents. Thus, they are considered additional public facilities. Supportive infrastructure components include one or more of the following service facilities: parks and green areas, schools, health centre, worship area, public market and public service buildings.

The Development Lease Agreement
The development lease agreement is between the developer and the Federal Capital Development Authority (FCDA). The both parties commit to a number of responsibilities. The developer commits to the following:

i. Jointly assessing with the FCT any development made by villagers in the allocated land and appropriately compensating the villagers (for which they were to be reimbursed by the FCDA).
ii. Not assigning or subletting any part of the allocated land.
iii. Submitting within 3 months of signing the development lease, building plans for approval and commencing effective mobilization to site.
iv. Providing secondary and tertiary infrastructure to the buildings.

The FCDA’s responsibilities include:

i. Deferring building approval fees until the developer processes title deeds for the built up properties in the estate.
ii. Guaranteeing approval of properly documented building plans by development control within one month of submission
iii. Providing primary and arterial infrastructure to the property but in situations where they fail to do as stipulated, the developer is at liberty to provide such infrastructure to make the building habitable
iv. Granting a Certificate of Occupancy directly to any person designated by the developer as a purchaser upon payment of all fees and deferred charges.

It is essential to note that developers in PPP for mass housing scheme are only granted access to develop. The title for the land remains with the FCDA. After development of land with all necessary secondary infrastructure, the developers can now sell to the general public and submit names of subscriber to the FCDA. It is only after a subscriber pays the appropriate fees that a Certificate of Occupancy, the statutory title deed in Nigeria, is issued (Abdallah and Aziz; 2010; Umoh 2012).

Effects of Infrastructure on Property Values
The state of infrastructure is an important parameter for assessment and indicator of status of any urban system (Ajibola et al., 2013). Olujimi (2010), asserted that the problems of deteriorated infrastructure are particularly peculiar in the old, indigenous core areas of the cities while the non-availability of infrastructure is peculiar to the outer spontaneous settlements that accommodate the low-income population. Public infrastructure when adequately provided offers multi-dimensional benefits within its operative network (Famuyiwa and Otegbulu, 2012). Real estate has no value if it has no utility, if it is not scarce and if it is not effectively demanded (Ajibola et al., 2013).

Economies require the development of infrastructure, such as water, energy, roads development, transport networks, information, and communication technology for sustainability and these urban services also positively influence the value of real estate as they improve housing conditions and quality (Famuyiwa and Otegbulu, 2012). Odudu (2003), observed that housing values tended to peak in those locations that enjoyed one form of infrastructure or the other. (Johnson et al., 2005) stated that one of the determinants of property value is infrastructure, the presence of which leads to appreciation in property values.

RESEARCH METHODOLOGY
The research aims at ascertaining the level of compliance by estate developers in the provision of infrastructure in public private partnership housing estates recommended by government in Abuja. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena is called research methodology (Rajasekaret et al., 2013). Checklist was used to take inventory of infrastructure available in existing estates. It was grouped into two sections, which consist; general information of estate and the list of infrastructure that should be available in estates as recommended by the FCTA/FCDA. The study is limited to public private partnership housing states in Abuja, Nigeria.

With regards the sample size for the use of checklists in estates, all efforts to ascertain the number of
estates from relevant authorities proved abortive. The sampling size was, therefore, determined based on the formula below considering the targeted population is unknown.

\[ n = \left( \frac{z^2pq}{d^2} \right) \]

Where:
- \( n \) = the desired sample size
- \( z \) = the ordinate on the normal curve corresponding to \( \alpha \) or the standard normal deviate. For the purpose of this study, a confidence level of 90% will be adopted. Usually a 90% level of confidence has \( \alpha = 0.10 \) and critical value of \( z_{\alpha/2} = 1.64 \).
- \( p \) = the proportion in the target population estimate to have a particular characteristics (normal between the range of 0.1-0.5)
- \( q = 1.0 - p \)
- \( d \) = degree of accuracy corresponding to the confidence level and \( Z \) selected.

The sample size is determined using the following parameters,
- \( z = 1.64 \)
- \( d = 0.1 \)
- \( p = 0.3 \)
- \( q = 0.7 \)

Sample size \( n = \left( \frac{(1.64)^2 \times 0.3 \times 0.7}{0.1} \right)^2 = 56.4 \)

Thus this study considered 56 estates from different districts randomly.

**FINDINGS AND DISCUSSION**

From the research work, the following findings were discovered, and presented in figures and tables for easy articulation and interpretation. A percentage of 85.7% PPP housing estates were visited in different districts allocated for PPP housing scheme.

The chart in Figure 1 shows the year of establishment of estates visited in percentages. The highest number of estates visited were established from 2006-2010 and the lowest number of estates visited fall under those established from 2000-2005.

![Figure 1: Year of Establishment of Estates](Source: Field Survey (2014))

Table 1 shows the type of residential buildings in the estates visited, 39.5% of the estates contained bungalows, 31.3% for duplexes, 22.9 for mixed buildings and 6.3 for mixed buildings.

<table>
<thead>
<tr>
<th>Type of Residential Building</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bungalows</td>
<td>19</td>
<td>39.5</td>
</tr>
<tr>
<td>Duplexes</td>
<td>15</td>
<td>31.3</td>
</tr>
<tr>
<td>Block of flats</td>
<td>3</td>
<td>6.3</td>
</tr>
<tr>
<td>Mixed buildings</td>
<td>11</td>
<td>22.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Table 2 presents the information about the existence of paved access road in the estates visited. As shown above 75% of the estates have paved roads while 25% of the estates have their access roads unpaved.

<table>
<thead>
<tr>
<th>Paved Access Road</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>36</td>
<td>75</td>
</tr>
<tr>
<td>Not Available</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Table 3 shows the percentage of provision of water supply in the estates visited. From the table, only 10.4% of estates have water provided by the developers and 89.6% do not have water provided by developers. The subscribers of estates without water supply, provide alternative source of water for themselves by sinking boreholes and digging wells. The main reason for the poor provision of water in estates can be linked to government’s inability to provide districts with water supply from the main trunk line.

<table>
<thead>
<tr>
<th>Water Supply</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>5</td>
<td>10.4</td>
</tr>
<tr>
<td>Not Available</td>
<td>43</td>
<td>89.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Figure 2 shows the existence of drainages in the estates visited. It was observed that 79.2% of the estates have drainages while 20.8 do not have drainages. From the results above a good percentage of estates have drainages provided by developers.

![Figure 2: Availability of Drainage in Housing Estates](Source: Field Survey (2014))
Table 4 shows the existence of streetlights in the estates visited. It was observed that 83.3% of the estates have streetlights while 16.7% do not have streetlights. The results shows that there is absence of street lights in few estates.

**Table 4: Provision of Street Lights by Private Estate Developers in Housing Estates**

<table>
<thead>
<tr>
<th>Street Lights</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>40</td>
<td>83.3</td>
</tr>
<tr>
<td>Not available</td>
<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Table 5 presents the provision of sewer lines in the estates visited in percentage. It shows the 100% of the estates do not have sewer lines provided. Based on the results above, it can be seen that none of the estates have sewer lines and soakaway are provided by developers. This is due to the absence of major sewer line connection that ought to be provided by the government.

**Table 5: Provision of Sewer Lines by Private Estate Developers in Estates**

<table>
<thead>
<tr>
<th>Sewer Lines</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not Available</td>
<td>48</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

From Table 6, 95.83% of the estates visited have electricity and 4.17% do not have electricity. This shows that most districts visited have power supply from the main grid line provided by the government hence the provision of electricity in estates.

**Table 6: Provision of Electricity by Private Estate Developers in Housing Estates**

<table>
<thead>
<tr>
<th>Electricity</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>46</td>
<td>95.83</td>
</tr>
<tr>
<td>Not Available</td>
<td>2</td>
<td>4.17</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Table 7 shows the availability of shopping facility in the estates. As seen below, 14.6% of the estates have shopping facility while 85.4% do not have shopping facility. There is poor provision of shopping facility in PPP housing estates.

**Table 7: Provision of Shopping Facility by Private Estate Developers in Housing Estates**

<table>
<thead>
<tr>
<th>Shopping Facility</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>7</td>
<td>14.6</td>
</tr>
<tr>
<td>Not Available</td>
<td>41</td>
<td>85.4</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

Table 8 shows the availability of recreational park in the estates. As seen below, 29.2% of the estates have recreational parks while 70.8% do not have recreational facility. Based on the findings an appreciable percentage of estates lack parks for recreational activities.

**Table 8: Provision of Recreational Park by Private Estate Developers in Housing Estates**

<table>
<thead>
<tr>
<th>Recreational Park</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>14</td>
<td>29.2</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>70.8</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

**CONCLUSION AND FURTHER RESEARCH**

From the findings, 75% have paved access roads, 10.4% have water supply, 79.2% have drainages, 83.3% have streetlights, 0% have sewer lines, 95.83% have electricity, 14.6% have shopping facility and 29.2% have recreational parks provided by the developers in housing estates visited. In conclusion, there is poor provision of sewer lines, water supply, shopping complexes and recreational parks respectively.

The poor participation of government in the partnership as regards the provision of main trucks for water supply and main sewer lines to districts has been attributed to the poor provision of these infrastructure to housing estates because secondary infrastructure in the estates depends on primary infrastructure to function. The low compliance to the provision of shopping complexes and recreational parks is due to the fact that developers convert land allocated for commercial and recreational purpose which is affirmed in the work of (Ibrahim and Kwankur, 2012).

It is recommended that government keep to its part of the partnership agreement by providing primary infrastructure to districts allocated for PPP housing estates. It is necessary to develop a master plan that incorporates working schedules of the government and estate developers in order to achieve synergy in the provision of infrastructure to districts and housing estates.

There is also the need for proper supervision and monitoring of relevant bodies to ensure developers adhere to the master plan. Adequate infrastructure provision plays an important role in our day to day activities. This study has established the basic infrastructure lacking in PPP housing estates in Abuja.

Further research should be carried out on the maintenance of infrastructure in public private partnership housing estates.
REFERENCES


