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Public Infrastructure and Sustainable Urban Mass Housing in Nigeria

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Abstract

This study discusses public infrastructure in urban mass housing in Nigeria, and how it can impact Sustainable Development. The study was conducted in Owerri, Imo State, Southeast Nigeria. Four purposively selected mass housing neighbourhoods for middle income residents within Owerri metropolis were appraised for neighbourhood infrastructure namely; network and quality of access roads and drainages, availability of public services, availability of communal activity areas, and safety and security measures in place in the neighbourhoods. Case study method was used for the study. Data collection was through pictorial documentation and on-site physical appraisal. The findings of the study show that estate infrastructure where available, were inadequate, thereby detracting from the achievement of environmentally and socially sustainable neighbourhoods for the residents. The study further revealed a clear absence of an integrated housing infrastructure policy which addresses quality of housing infrastructure and its implications for social sustainability. It is therefore recommended that housing estate development in Nigeria must integrate from the beginning, basic facilities and services that will complement the individual housing units, create a sense of community, and ensure proper management and maintenance of the estates. These are considered critical to the attainment of Sustainable Cities and Communities (SDG goal 11).

Keywords: Housing; Infrastructure; Nigeria; Sustainable development; Sustainability

1. Introduction

Housing is a fundamental need in human civilisation. It is known that the quality of housing of a people is usually an indicator of their values and ways of life. It is also a determinant of their development. Housing goes beyond individual units of buildings to include the social infrastructure and services available to a housing neighbourhood. These infrastructure help

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create a sense of community among urban residents. The need to house the teeming urban population in Nigeria has been a recurring discussion in the Nigerian space. Expectedly, attempts at providing mass housing for the urban population have not been by the government alone, but also by private sector property developers who have seen opportunities in the housing deficit which has remained steady at 17 million units for up to a decade (Isah, 2016). The non-reduction in the housing deficit has been a combination of under-provision of housing on a yearly basis for the past decade, and an average population growth rate of roughly 2.6% for the period (TradingEconomics.com, 2016). This huge housing deficit provides both a challenge and an opportunity for built environment professionals and all concerned stakeholders. The opportunity provided here would be that of redefining the character and quality of urban housing in Nigeria, by providing 17 million new housing units that meet up with accepted requirements of adequacy and sustainability.

The concept of sustainability centres on the use of resources in such a way as to preserve them for future generations. The adoption of the 2030 Agenda for Sustainable Development by all United Nations member states in 2015 made attainment of sustainable development by all more feasible, as a clear roadmap and concrete deliverables were clearly outlined to help member nations monitor their progress in the attainment of the goals. This agenda provides a blueprint for present and future peace and prosperity for people and the planet (UNDP, 2018). Goal 11 of the Agenda focuses on sustainable cities and communities. It aims at a future where cities provide opportunities for all, and grant access to basic services, housing, transportation and more. It is crucial that existing and emerging cities are sustainable. Cities are not only a hub of ideas, but also of social, economic, and cultural development among others. It is projected that by 2030, five billion people will reside in cities, and with increased population of urban dwellers, come increased challenges of congestion, lack of basic services, shortage of adequate housing, declining infrastructure, and rising air pollution (UN, 2019).

Housing is a primary component of cities which grants access to shelter, protection from physical and climatic elements, and a platform for activities that support livelihood. Housing, beyond shelter, has a crucial role in achieving sustainable development (Golubchikov and Badyina, 2012). Sustainable development is appropriately captured in three aspects namely environmental, social, and economic sustainability. Environmental sustainability is the maintenance of factors and practices that contribute to the quality of the environment, so as to serve both the present and future generations (Morelli, 2011; UNEP, 2020). Social sustainability seeks the achievement of a defined level of social well being for all people for an indefinite period of time. Economic sustainability on the other hand seeks to maintain viable local economies by making the most out of available resources. Adequate housing appropriately keys in to aspects of environmental, social, and economic sustainability.

This study focuses on social sustainability of urban mass housing neighbourhoods in Nigeria. Social sustainability in housing neighbourhoods is important because of the role housing plays in societal development. The types and quality of social infrastructure available in the estates studied were appraised to ascertain how well they allow collective access to social resources. Access to social resources by majority of housing residents, is a step closer to the quest for adequate housing, the lack of which is believed to not only compromise development, but also has the likelihood of threatening the security of the general population (Tshitereke, 2008).

2. Aim and Objectives of the Study

The aim of this study is to determine the role of quality of public infrastructure and services in sustainable urban mass housing development in Nigeria. The objectives of the study are:

(1) To assess the quality of access roads and accompanying drainages in selected housing estates in Owerri.
(2) To assess the quality of basic public services like power supply, water supply, and refuse collection in the housing estates.
(3) To assess the existence and quality of communal and recreational areas in the estates
(4) To assess the measures put in place for safety and security in the estates
(5) To observe the nature of social and communal interactions among estate residents

3. Literature Review

3.1 Housing and Social Sustainability

Housing impacts on the socio-economic, cultural, and environmental components of society (Ibem and Azuh, 2011). The sense of "true stake in a community by residents has been attributed to home ownership on the most part (Kolawole, 2015). Good communities in turn help promote economic inclusion. The social benefits of housing include intangible things like residents' concern with the public good of their communities. For housing to impact positively on the social well being of communities, it has to meet up with acceptable criteria of adequacy. Adequate housing is housing that meets the needs of the intended users, including cultural adequacy as enshrined in the United Nations Right to adequate housing. Cultural adequacy recognises the role of housing in expressing cultural identity through diversity and tolerance, and by so doing, building the bridges of social inclusiveness. Social inclusiveness is often expressed in seemingly intangible concepts such as identity, sense of place, and benefits of social networks. All these form the critical bedrock for social sustainability (Mak and Peacock, 2011).

Housing is a significant part of any urban environment. Sustainable urban environments are characterised by spaces within which the social needs of a people are fulfilled (Yiftachel and Hedgecock, 1993). The physical form of urban environments should therefore be such as to achieve the fulfilment of those needs. Social sustainability has the added benefits of equal opportunities and tolerance for diversity, and an increased likelihood of accepting existing governance structures (Barron and Gruntlett, 2002). Additionally, socially sustainable communities have been known to provide excellent quality of living (Mak and Peacock, 2011).

The building blocks for social sustainability have been identified as amenities and social infrastructure, social and cultural life, voice and influence, and space to grow (Woodcraft, Hackett and Caistor-Arendar, 2011). The absence of any of these could create imbalance and frictions in the social environment. Mass housing neighbourhoods with large collections of people are places where different types of social behaviour are incubated and developed. The quality of the housing environment is thus a critical determinant of the type of social behaviour developed therein, because as posited by Woodcraft et al. (2011), without the right social infrastructure, new housing communities can quickly spiral into decline. Building environment professionals have a very important role to play in advancing social sustainability, as environmental considerations in design can affect social sustainability of neighbourhoods, while also meeting the conditions, norms and preferences required for people to support ecologically sustainable actions (Davidson and Wilson, 2009).

3.2 Housing and Public Infrastructure

Infrastructure is defined as the basic systems and services such as transport and power supplies that a country or organisation uses in order to work effectively (Infrastructure, 2020). It incorporates both the basic physical and organisational structure needed for society to operate (Isah, 2016), be it a housing estate, or the larger community. The poor state of housing infrastructure in Nigeria has been discussed severally among professionals in the built environment. Urban housing in Nigeria has been described as substandard and environmentally unsanitary (Olotuah and Taiwo, 2015), deficient in required infrastructure (Olokesusi and Okunfulure, 2000), and detrimental to human capital development (Ogunsanya, Fanu, and Oladipo, 2016). As posited by Enobakhare (2015), a residential estate devoid of basic amenities required for healthy and safe living is no different from a slum. Slum dwelling is not adequate housing as it is detrimental to environmental, social, and economic sustainability. Expectedly, whenever people are deprived of basic infrastructure, the result is impoverishment (Morakinyo et al., 2014).

Housing infrastructure and services are the supports upon which viable communities develop. Individual housing units are bound together through the common facilities they share. The quality of these facilities directly affect the well being of the residents as they determine to a large extent, access within and outside communities, ability for residents to enjoy their individual homes in comfort, freedom to interact socially with neighbours, and the confidence to live in safety and security within the housing neighbourhoods. Evaluation of housing quality goes beyond the design and construction quality of individual units, to include the provision and performance of public amenities that serve the houses (Olotuah and Taiwo, 2015).

There are a number of facilities and services that make up housing infrastructure. However, the basic ones that must form part of any housing estate are roads, drainage, electricity, water supply, waste disposal services, communal spaces for social interactions, recreational facilities, and security. These basic infrastructure are often inadequate or totally lacking in some estates in Nigeria as confirmed in the study by Morakinyo et al. (2014) on infrastructural provision in Bashorun Estate Ibadan, and the documented outcry of Abuja residents over the state of their estate roads (Suleiman, 2016). These key housing infrastructure are briefly described as follows:

- *Road network and surface water drainage*: Road network accounts for effective traffic control within the estate. Pedestrian access should be provided for people to move around safely on foot. Facilities should be provided for users of public transport and the road network should effectively link every house in the estate, and enable unhindered access to fire trucks and other service vehicles. The roads should be properly drained. Drainage channels should be provided as appropriate for the discharge of storm water after the rains.

- *Public services*: Public services include electricity supply, water supply, and waste management. Availability of these services not only help the individual units to run properly, but also ensure the proper functioning and cleanliness of the different aspects of the neighbourhood.

- *Communal areas and recreational facilities*: Places for communal interaction provide members of a community an opportunity to engage in both formal and informal activities with their neighbours. Engagement with neighbours can help break barriers and reduce suspicions based on ethnic, cultural, and religious differences. Facilities like shops, schools,

recreational facilities, playgrounds, and places of worship can improve the enjoyment of a housing neighbourhood by residents, and create a sense of ownership among them. This sense of ownership often elicits a determination by the residents to contribute effectively to the sustenance of that which belongs to them; in this case, their housing estate. This eventually translates to better maintained estates and better living environments.

- *Safety and security*: Safety and security are key elements in encouraging a sense of community in housing neighbourhoods. Measures to ensure safety include the character or design of individual housing units, appropriate positioning of sensitive facilities such as children's play areas, security monitoring through cameras and security personnel, physical barriers like gates and fences, and additional infrastructure like street lights etc. The measures adopted should be compatible with the expectations of safety and security of the housing residents they are meant to serve, and should not impede escape in an emergency. Maintenance of facilities in good condition is also a critical factor in estate security, as high quality, well maintained public places discourage deviant behaviour to a large extent, and can improve perceptions of personal safety.

4. Research Methodology

The study was carried out in Owerri, the capital city of Imo state, Nigeria. Three local government areas make up Owerri administrative territory. They are Owerri North, Owerri West, and Owerri Municipal. The population of study is all mass housing estates in Owerri having a minimum of one hundred (100) housing units that range between two-bedroom to five-bedroom house types, either detached or semi-detached. World Bank Housing scheme in Owerri was excluded from the research. Available records show that there are six (6) housing estates managed by the state government which meet the stated criteria, and two (2) managed by the Federal Government of Nigeria. These housing estates are largely considered as middle-income housing neighbourhoods, even though the housing types range from housing for the lower-middle income, who share similarities with the low-income group, to the middle-middle income, and all the way to the upper middle income who share similar characteristics in some instances with the rich.

Table 1: Estates and House distribution in Owerri (April 2012)

S/N	Name of Housing Estate	No of houses
1.	Aladinma and Aladinma phase II	431
2.	Federal Low cost Housing Uratta	144
3.	Trans – Egbu	176
4.	Prefab, prefab Ext I, Ext II	236
5.	Umuguma Area 'S' 'X' and 'XA'	163
6.	Redemption	299

Source: Imo State Housing Corporation ISHC Owerri (ISHC, 2012)

Table 2: Housing Estates under Federal Government Control

S/N	Name of Housing Estate	No of houses
1.	Egbeada	136
2.	Graceland	141

Source: Physical enumeration by researcher

Case study research method was employed. This method affords the researcher the benefit of in-depth and up-close appraisal of the object of study. Case study research is a systematic enquiry which aims at describing and explaining phenomena of interest (Bromley, 1990). It is unique because of its scientific credentials and its evidence base for professional applications (Zucker, 2009). While generalisations may not be applied in case study research, it can however be used to test if, and how well theories and scientific models work in the real world (Shuttleworth, 2008).

A total of eight estates made up the study population. All the estates exhibited certain commonalities which included variations in house types (ranging from 2-bedroom to 5-bedroom house types), and character of housing (mostly detached and semi-detached bungalows). Four (4) out of the eight (8) estates were selected for the study through purposive sampling. This non-random sampling technique was adopted for convenience, as one middle class housing estate was considered as equally representative of the sample population as the other, bearing in mind the chosen research method. However, certain criteria guided the selection; the estates had to be fully operational, planned to accommodate varying categories of prototype houses, and clearly delineated as homogeneous residential neighbourhoods. They were also selected because of the convenience of getting research assistants to conduct the study within the estates. This sampling technique was considered appropriate as it depends on the researcher identifying what needs to be studied, and setting out to find appropriate cases that can yield the required information.

The selected estates are:

(1) Trans Egbu Housing Estate off Egbu Road
(2) Graceland Housing Estate, off Owerri-Onitsha Road
(3) Federal Housing Estate, off Chukwuma-Nwoha Road
(4) Egbeada Housing Estate off Ordu Road

The methods of data collection for the case studies included pictorial documentation, and direct appraisal of existing features. The selected cases were appraised for the following variables which are key determinants of quality of public infrastructure in housing formations:

(1) Access roads and drainages
(2) Public services
(3) Communal areas and recreational facilities
(4) Safety and security.

4.1 Case Studies

4.1.1 Case Study 1: Trans Egbu Housing Estate

Preamble

Trans-Egbu Housing Estate is located off Egbu Road in Owerri-North Local Government Area. The estate can be accessed from either Egbu Road or MCC/Uratta Road. Dick Tiger Road is the major arterial demarcating Trans-Egbu Housing Estate from the nearby Federal Housing Estate. According to Imo State Housing Corporation (ISHC), the official custodians of the estate, there are a total of 176 semi-detached and detached houses comprising of 79 two-bedroom units, 82 three-bedroom units, and 15 four-bedroom units. Each housing unit has a defined road access. The estate was built by the Imo State government, using prototype designs for the different units. Over the years, however, there have been immense transformations of

the houses ranging from minor repair works to major reconfigurations of the roof and overall facade of some of the buildings. These changes have largely distorted the initial uniformity in the design of the estate.

Plate 1: Base Map of Trans Egbu Housing Estate (source Google maps)

Plate 2: Nguru Mbaise Street

Roads/Drainage

The major road into the estate which links MCC Road to Egbu Road is the Dick Tiger Road. A part of this road is currently under reconstruction, having been in a severely dilapidated state for a

long time. The other feeder estate roads have not fared any better, as almost all of them have their top surfaces completely eroded and thus difficult to navigate through (see Plate 3). The roads were initially constructed with side drainage channels, however, as a result of a number of factors including non-conformity with the natural drainage pattern, silting, and blockages caused by waste deposits and weed, most of the drainage channels are non-functional. This has led to eroding of the hard surfacing on the roads, and flooding (see Plates 4 and 5).

Plate 3: Benedict Nwamadi Street

Plate 4: A flooded street with blocked gutters

Plate 5: Chief Nnadi Street

Plate 6: Overhead tank for water storage

Public Services

The entire estate is connected to public power supply. Overhead power poles are seen dotting the entire estate (see Plate 5). Additionally all lots within the estate were at inception, connected to the public water works which has been non-functional for well over five years. Due to road reconstructions, most of the water pipes have been damaged or uprooted. As a result, residents have resorted to either buying water from water vendors which are discharged into storage tanks, or drilling boreholes within their properties (see Plate 6). Refuse collection in the estate is not coordinated. Residents dispose of their wastes indiscriminately at street corners, or drop them off at the refuse bin located at Dick Tiger Road. This bin is a considerable distance away from the central core of the estate, making it difficult for many households to access it. The immediate vicinity of the bin is very filthy and gives off a putrid odour.

Plate 7: Refuse collection point

Plate 8: Open field

Communal Areas and Recreational Facilities

The communal areas identified in this estate are one nursery/primary school, and an open area which could serve as both a football field and a meeting point for communal activities and outdoor events. No other shared public spaces were seen in the estate. The school is centrally located and can be accessed from the different sections of the estate. The open area on the other hand is over-grown with weed, and appears not to have been used in a long while (see Plate 8).

Plate 9: A privately owned school in the estate

Safety and Security

Individual residents make personal security arrangements. In most houses, fences are raised very high, to obscure view from outside, and give a sense of security. Private security men are also hired by those who can afford it, and security dogs are on-guard in many of the compounds.

4.1.2 Case Study 2: Graceland Housing Estate

Preamble

Graceland estate was developed based on a Public Private Partnership (PPP) arrangement. It is a residential estate comprising of a total of 255 units of bungalows and duplexes, ranging from three-bedroom to five-bedroom units. All the housing units have provisions for service quarters within their properties. The estate caters for the middle middle class and the upper middle class. It is bordered by two other middle-class estates namely: Arugo Garden Estate, and Egbeada Housing Estate. These three estates are within the Federal Housing Authority (FHA) property, and can be accessed either from Owerri-Onitsha Road, or the Amakohia end of Orlu Road.

Roads/Drainage

Graceland Estate has a good network of roads, ensuring access to all sections of the estate. The roads are provided with side drains to help in the discharge of storm water after the rains. Some of the drains are blocked, and residents report substantial flooding of the estate when it rains (see Plates 11, 12, and 13).

Public Services

An in-house articulated water supply system is used in the estate. A central overhead tank serves the entire estate and supplies the individual housing units. Some houses have private tanks for water storage. Electricity supply is from the public mains, fed through transformers provided in the estate. Residents augment the erratic supply with private power generating sets.

Plate 10: Base Map of Graceland Housing Estate (source: Google maps)

Plate 11: Fabian Osuji Street

Plate 12: Road showing patched up areas

Plate 13: Blocked and broken drain

Communal Areas and Recreational Facilities

Graceland estate has a number of facilities for communal activities and recreation. These include an open field for outdoor activities, a shopping mall, an events centre, and a hotel still under construction (see Plates 15, 17 and 18). There are churches and schools outside the estate, but near enough for use by the residents.

Safety and Security

The estate has a concrete perimeter fence around it and a security gate with personnel who work shifts. In addition, there are mobile police men who patrol the estate day and night on foot and with motorcycles. There are street lights all around the estate for illumination at night.

Plate 14: Overhead tank

Plate 15: Open field for outdoor activities

Plate 16: Refuse dump on the main road

Plate 17: Event Centre and Hotel behind

Plate 18: Interior of the shopping mall

Plate 19: Security gate

4.1.3 Case Study 3: Federal Housing Estate Uratta

Preamble

Federal Housing Estate Uratta is located off MCC Road. Chukwuma-Nwoha Road, a road cutting across MCC Road to Egbu Road is the major access into the estate. According to Imo State Housing Corporation (ISHC) records, there are a total of 144 housing units in the estate comprising of 14 two-bedroom houses, 116 three-bedroom houses, and 14 four-bedroom houses. There are also a number of housing estates nearby. They are Aladinma, Prefab, Trans-Egbu, and Uratta Road housing estates.

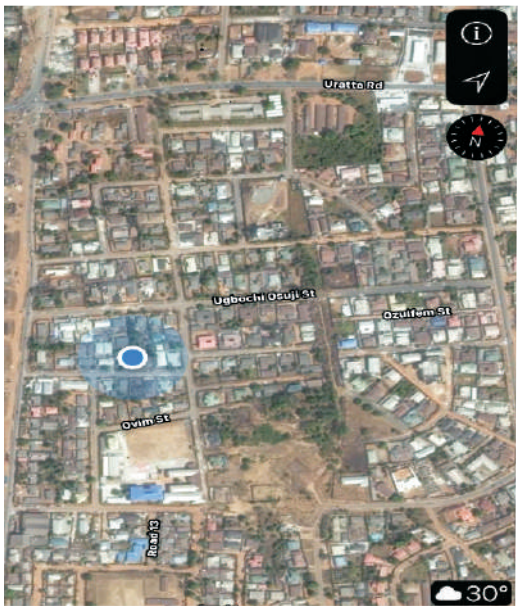

Plate 20: Aerial view of the estate (Google maps)

Plate 21: Eze Nwachukwu Udeaku Street

Plate 22: Road behind St. Paul's Secondary School

Plate 23: Estate road eroded by rainwater

Public Services

The estate is connected to public source of power. Individual households use generators to provide electricity to their houses in the absence of steady supply from the public source. All the buildings in the estate were initially connected to public water supply from Imo State Water

Corporation. This service is no longer operational, leaving residents with no other option than to make private arrangements for water supply, which include drilling boreholes or sourcing water from water vendors. Some residents have water discharge points in their properties which they use to supply water to other residents as a commercial venture. Refuse disposal within the estate is uncoordinated. Residents dump wastes generated from their houses indiscriminately on roads and street corners. Disposal trucks are seen at irregular intervals carting away refuse from Chukwuma Nwoha Road, leaving internal roads and street corners. The dump sites end up dirty, smelly, and unsightly. The roads and gutters are not cleaned, as there is no operational estate maintenance outfit. As a result, the entire estate is strewn with refuse and overgrown with weed (see Plates 21, 22, and 25).

Plate 24: Weed overgrowth by the sides of the road

Plate 25: Flood activity in front of the commercial centre

Plate 26: Disposal truck carting away refuse on Chukwuma Nwoha Road

Plate 27: Water supply outlets from a residence

Communal Areas and Recreational facilities

The estate has a commercial area that houses a number of retail shops, beer parlours, and grocery stands (see Plate 23). The estate also has a government owned nursery and primary school, and a privately owned secondary school. The estate sports club was acquired by a private business, bulldozed, and rebuilt as a warehouse for sale of alcoholic beverages. Presently there is no communal space for socialisation, recreation, or other informal interaction in the estate.

Safety and Security

There is no perimeter fence in the estate. Security arrangements are handled on a street level, as organised by concerned residents, with arrangements differing from street to street. Security gates are visible on some streets in the estate (see Plate 25), and are manned by private security guards. However, low compliance with contributions to offset payment of the security guards, was cited as the reason for the breakdown of this arrangement in some streets. As a result, many residents had to fall back to personal arrangements. In addition to these is the absence of street lights, making the estate very dark in the night, and residents unable to move about freely at night for fear of muggings and robberies which are quite frequent in the estate.

4.1.4 Case Study 4: Federal Housing Estate Egbeada/Irete

Preamble

Federal Housing Estate Egbeada is a large housing estate which provides housing for the lower middle class, the middle middle class, and the upper middle class, all properly zoned in different sections of the estate. It can be accessed from Owerri Onitsha Road, or Orlu Road Amakohia. It is located near Arugo Gardens Estate and Graceland Housing Estate.

Roads/Drainage

The main access road into the estate is in a serious state of disrepair. Although there is a good network of roads within the estate, however almost all the roads are earth roads with no hard surfacing.

Plate 28: Earth road in the estate

Plate 29: Muddy road at the entrance of the estate

Plate 30: Road badly eroded by water

Plate 31: Potholes on the road

This makes it difficult to ply the roads both in the rainy season and the harmattan season. To compound the road problem, most sections of the estate, especially the area for the higher middle class, do not have drainage channels for storm water drainage. Consequently, the roads are flooded and develop potholes during the rainy season. Some roads are also eroded for the same reason.

Public Services

Electric supply into the estate is from the public supply source, and as reported by the residents, very erratic. As with the other estates, private sources of power supply are employed by residents. There is no articulated water supply in the estate. Individual households drill boreholes, and with pump and overhead tank system, provide potable water to their homes. Overhead tanks are visible in Plate 28. There is no coordinated refuse management system in the estate. Residents bag their household wastes and drop them off in nearby bushes, and sometimes by the sides of the road (see Plates 32 and 33). Some other residents arrange with private refuse disposal companies, who are paid for picking up the refuse at their door steps.

Plate 32: Refuse scattered in front of a building with a shop front

Plate 33: Heap of dirt on the road

Communal Areas and Recreational Facilities

There is no clearly marked out shopping centre in the estate. Some residents provide shops in their residences to fill the gap (see Plate 34). This largely distorts the original concept of the estate. There are three privately owned nursery and primary schools. However, these schools do not have adequate spaces for playground for the children. There is no secondary school in the estate. There are a number of churches in the estate, used by the estate residents. There is a privately owned relaxation centre in the estate, used mostly for relaxation, entertainment and meetings by the residents. There is no open field for sports and recreation.

Plate 34: The relaxation centre

Plate 35: Residences turned to shops

Safety and Security

There is perimeter fencing over large portions of the estate. There are two security gates into the estate from the main access road that connects Onitsha Road to Orlu Road. All security arrangements in the estate are by residents who engage private security personnel to keep watch in the absence of formal police presence. There are no street lights in the estate, making it always dark at night.

Plate 36: Inside the relaxation centre

Plate 37: The main gate into the estate

5. Discussion

The housing estates studied show glaring deficiencies in public infrastructure. Provision of public services, communal activity areas, and security were better co-ordinated in Graceland Housing Estate than in the others. However, it is also the newest, having been operational for less than twenty years. Generally, there were clearly significant shortcomings in neighbourhood infrastructure and facilities in the estates studied. The poor quality of the estates were found to be as a result of one or a combination of the following reasons:

- Some basic infrastructure and services were not provided at the inception of the estates, leading to early deterioration of the neighbourhoods.
- Where public infrastructure and services were provided, they were of such poor quality that they quickly deteriorated within a short time.
- Good quality infrastructure and services were provided from inception, but deteriorated over time due to lack of maintenance.
- Non-articulation of effective maintenance plan for both housing units and neighbourhood infrastructure led to inevitable disrepair and in some cases ultimate dilapidation of the estates.
- Indiscriminate change of land use drastically altered the cohesion and residential outlook of the estates.

The observed significant shortcomings in quality of estate infrastructure and services are expected to greatly impact social interactions, as estate infrastructure usually serve as the hub for communal interactions and social networks. The housing neighbourhoods were also observed to be prone to exposure to security hazards and other health threatening factors. This effectively makes the housing neighbourhoods unsafe places for full expression of family living, denying the residents a crucial benefit of housing. Absence of neighbourhood safety and security impinge on resilience, sustainability and inclusion, which are all determinants of sustainable cities and communities. The resulting effects are glaring inequalities, missed opportunities, ineffectual

cultural integration and stunted economic development, which affect both the immediate and larger communities.

The United Nations projection for 2050 is that two-thirds of all humanity will reside in cities by then. Cities are made up of people, including the facilities, services and infrastructure that support the people. Quality of residential environment is one critical indicator of the way of life of a people, and investment in good neighbourhoods has the potential of improving social, economic and environmental outcomes of cities. Findings of this study show that as a result of the severely poor infrastructure in the estates studied, housing residents are preoccupied with improving their individual units, while resigning to the reality of degraded surroundings, which overtime become acceptable as normal. Consequently, there is no social cohesion among residents, as there are fewer opportunities for interaction largely due to dearth of relevant infrastructure. As a result, there are no safeguards against social malaise in the neighbourhoods, leading to breakdown of order within the neighbourhoods. The lack of social interaction between neighbours further reinforces suspicion and stereotyping, and detracts from the goals of building sustainable cities and communities.

6. Conclusion and Recommendations

Deficiencies in infrastructure in the estates studied are expressed in dilapidated roads, flooding during the rains and generally dirty and unkempt surroundings. Unkempt public spaces reflect lack of cohesion in the community due to a lack of sense of ownership by residents. Lack of sense of ownership births a non-committal attitude towards ensuring the well being of the estate. This cycle of disorder is sustained, as poor quality neighbourhoods appear to be both the cause and the result of lack of sense of community. The issue of housing infrastructure cannot be handled effectively by individual house owners, as resources for implementation are well beyond their reach. It is expected that residential neighbourhoods must have in place, basic infrastructure, which together with the housing units, qualify them to be categorised as housing estates.

The possibility exists that the reluctance to engage in the community by residents could be as a result of the sheer enormity of the deterioration of their neighbourhoods, such that they want to distance themselves as much as they can from the neighbourhoods. This can also explain the efforts residents make to provide all the facilities they need within the confines of their individual lots, including barricading themselves from their neighbours. In the light of these, social sustainability suffers, as all its benefits including tolerance of diversity and differences, improved quality of life, and improved acceptance of governance structures (Barron and Gauntlett, 2002) are lacking, and therefore cannot be exploited for public good.

In view of the role of housing in showcasing the level of development of a people, it is imperative that housing reflects the goals and ideals of a people. Housing should match the level of exposure and intellectual development of its residents. It should also enhance their desire for social interaction and recreation, and their quest for clean decent living. In the absence of good quality housing, substandard living results, with the potential to greatly diminish creativity of a people and hamper their overall well being. The benefits of good housing for Nigerian urban residents can therefore not be overstated, as it can redirect social character for good. Good quality housing for Nigerian urban residents can only be attained if proposed new housing developments are approached differently from what is presently obtainable in the estates studied. To achieve good quality housing, the following recommendations are made:

(1) New designs of housing estates should create a strong relationship between communal areas and individual housing units, with the communal areas acting as the focal point of the estate. This will help strengthen participation by residents, and foster a greater sense of belonging among them.

(2) Basic infrastructure like roads, drainage, power supply and water supply should be properly planned from inception. It is important that roads and drainages be built well, and of durable materials. Water supply should be coordinated from a central source, and treated for use of estate residents. This will help curb indiscriminate drilling of boreholes, and the attendant environmental hazards.

(3) Every urban mass housing estate in Nigeria should have a dedicated Facilities management outfit, to handle maintenance of public facilities, security, and ensure cleanliness of the estate surroundings. It should also be their duty to maintain standards in the estate, so as to prevent the estates from slipping into dilapidation. This should be statutory in estate development. It will also be the obligation of the residents to pay a fee for the services rendered, and to ensure that they get quality for money paid.

(4) Change of land use in the estate should only be undertaken for public good, and after due consideration of the social and environmental impacts of such change.

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