Technische Universität München

TUM School of Engineering and Design

From Affordable Housing to Slum: Assessment of the Causes, Effects and Solutions in the City of Enugu, Nigeria

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Vollständiger Abdruck der von der TUM School of Engineering and Design der Technischen Universität München zur Erlangung eines Doktors der Ingenieurwissenschaften (Dr.-Ing.) genehmigten Dissertation.

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Prüfer der Dissertation:

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Die Dissertation wurde am 17.05.2023 bei der Technischen Universität München eingereicht und durch die TUM School of Engineering and Design am 05.09.2023 angenommen.

Declaration

According to § 12 section 8 ADPO (General examination regulations) of TU Munich, I herewith confirm that I wrote this thesis entirely by my own and that I did not use any other sources, means of support and aid than those mentioned within the text.

Munich 15/05/2023

Agboeze Anthony Ikechukwu

Acknowledgement

First, I thank my supervisor, Professor Walter Timo de Vries, for accepting to supervise my research. Through working with you, I learnt new skills, got new knowledge, and networked with other members of the doctoral team who supported me through this research journey.

I thank the management of the KAAD scholarship organization for providing me with the study funding which enabled me to finance my research. Thank you for involving me in your numerous educative and social events which widened my career outlook to opportunities and helped me to connect with many new networks. I will surely transfer the knowledge and the skills I acquired into improving other people's lives. A special thanks to Ms. Sabine Gerhard of the KHG-TUM for her consistent mentoring and career planning advice.

I also extend my heartfelt gratitude to my research mentor, Dr. Arc Pamela Duran Diaz for the unlimited attention she invested in guiding me through the whole process of learning and conducting my research. Thank you for your thoughtfulness in always suggesting resource persons, materials and events that would help me conduct a good research. You also mentored my teaching hours to help me improve my lecturing skills on constant basis.

My further gratitude goes to my co-doctoral candidates whose company and comradeships I enjoyed throughout this research period. I thank Pierre Damien Ntihinyurwa who routinely asked me about my research progress, and spared some quality time to discuss my written drafts whenever I shared them with you. I also thank Walter Dachaga who always called to check up on me, asking me about my research progress, and about my work-life-balance. I appreciate your constructive feedback on my research proposal during the beginning stage of my thesis draft. Thank you, Vineet Chaturvedi, for your spontaneous pledge to assist me in any way I felt you could. I took that opportunity to ask you all the boring questions about maps, GIS, and cartography. You always responded promptly, and your feedback was a game changer. I share my many thanks with Prince Donkor Ameyaw who always motivated me by sharing his good news with me. This solidified my belief that hope lies ahead for every hard work one does. I wish I could continue to write about everyone, but I may end up missing out on most people because all of you have been positively impactful on me throughout my research period. Thank you Bouchra Lamhamedi, Marco Holzel, and Bayarmaa Byambaa.

Thank you to the TUM community, and all the staff, lecturers and professors whose contributions towards improvement and delivery of knowledge has culminated into my current formation. Hence, I give special thanks to Ms. Christine Schwarz who made working in the Chair of Land Management interesting. I remember coming to pick up my scholarship letter in your office – the cheer of congratulations which I received from you means a lot to me. Thank you for always asking me about the wellbeing of my family back home especially during the COVID-19 pandemic season – I repeat, like I always responded, "they are all fine" and are saying "hello" back to you.

I vote my highest thanks to my family who have always supported my academic pursuit at different stages of my life. My doctoral study period has robbed you of the luxury of seeing me often especially on most holidays which I did not visit. However, my attention which you missed has turned into a benefit for me and the whole family.

Abstract (in English)

Since attaining an urban status, Enugu's population has continued to grow rapidly, leading to growing demands for housing by the teeming population, which is predominantly low-income. Several government dispensations have developed various affordable housing schemes to help deliver decent housing to Enugu populace. However, over a long period of usage, some of those housing schemes in Enugu are unabatedly deteriorating into slums alongside rising housing deficit. Emerging from a literature review, this research posits that the link between slum and affordable housing is that both the seekers of affordable housing and slum housing are low-income earners. The extended commonalities are that low-income housings can decay into slums and vice versa. Causes of this slum emergence were determined by analyzing the Nigerian housing policy and collecting expert and non-expert primary data which were further analyzed using interpretative approach for the collected qualitative data and correlation analysis for the quantitative data.

Findings from the Nigerian housing policy analysis suggest that there is poor/non-implementation of the housing policy while some other loopholes in the policy allow developers to deliver poor quality and unaffordable housing without consequences. Results from the expert data further suggest that poor planning and poor management cause the emergence of slums from delivered affordable housing in Enugu. Corroborating the expert data results, non-expert survey results show that above 60% of the occupants are tenants because they cannot afford to own the supposed affordable houses. Hence, there is high tenure insecurity and high unwillingness to maintain the houses because they do not own them.

Therefore, this research recommends the provision of incentives to developers who adhere to the Nigerian housing policy to increase its implementation while a review of some parts of the policy should be done to address its loopholes. This research also recommends participatory management by engaging the occupants in the monitoring and reporting of breakdowns in the housing estates. Furthermore, this research recommends innovative design and planning models to produce improved housing schemes that are slum-proof. This research additionally recommends alternative construction methods and alternative financing models to improve the affordability of those housing schemes.

Keywords: affordable housing, slum, low income, housing policy

Abstract (German)

Seit der Erlangung des städtischen Status ist die Bevölkerung Enugus weiter rasant gewachsen, was zu einer steigenden Nachfrage nach Wohnraum seitens der überwiegend einkommensschwachen Bevölkerung geführt hat. Mehrere Regierungsgenehmigungen haben verschiedene bezahlbare Wohnprogramme entwickelt, um der Bevölkerung von Enugu angemessenen Wohnraum zu bieten. Allerdings verschlechtern sich einige dieser Wohnsiedlungen in Enugu über einen langen Zeitraum hinweg unaufhaltsam zu Slums, während gleichzeitig das Wohnungsdefizit zunimmt. Basierend auf einer Literaturrecherche geht diese Studie davon aus, dass der Zusammenhang zwischen Slums und bezahlbarem Wohnraum darin besteht, dass es sich sowohl bei den Suchenden nach bezahlbarem Wohnraum als auch bei den Slumwohnungen um Geringverdiener handelt. Die erweiterte Gemeinsamkeit besteht darin, dass einkommensschwache Unterkünfte in Slums verfallen können und umgekehrt. Die Ursachen dieser Slumentstehung wurden durch eine Analyse der nigerianischen Wohnungspolitik und das Sammeln von Experten- und Nicht-Experten-Primärdaten ermittelt, die mithilfe eines interpretativen Ansatzes für die gesammelten qualitativen Daten und einer Korrelationsanalyse für die quantitativen Daten weiter analysiert wurden.

Die Ergebnisse der Analyse der nigerianischen Wohnungspolitik deuten darauf hin, dass die Wohnungspolitik schlecht bzw. nicht umgesetzt wird, während einige andere Schlupflöcher in der Politik es Entwicklern ermöglichen, minderwertigen und unbezahlbaren Wohnraum ohne Konsequenzen bereitzustellen. Die Ergebnisse der Expertendaten deuten außerdem darauf hin, dass schlechte Planung und schlechtes Management die Entstehung von Slums aus bezahlbarem Wohnraum in Enugu verursachen. Die Ergebnisse von Expertenbefragungen werden durch nicht von Experten durchgeführte Umfragen bestätigt, die zeigen, dass über 60 % der Bewohner Mieter sind, weil sie es sich nicht leisten können, die vermeintlich erschwinglichen Häuser zu besitzen. Daher besteht eine hohe Unsicherheit hinsichtlich der Besitzverhältnisse und eine große Zurückhaltung, die Häuser instand zu halten, weil sie ihnen nicht gehören.

Daher empfiehlt diese Studie die Bereitstellung von Anreizen für Entwickler, die sich an die nigerianische Wohnungsbaupolitik halten, um deren Umsetzung zu verstärken. Gleichzeitig sollte eine Überprüfung einiger Teile der Politik durchgeführt werden, um ihre Lücken zu schließen. Diese Studie empfiehlt auch ein partizipatives Management, indem die Bewohner in die Überwachung und Meldung von Störungen in den Wohnsiedlungen einbezogen werden. Darüber hinaus empfiehlt diese Forschung innovative Design- und Planungsmodelle, um verbesserte Wohnsysteme zu schaffen, die Slum-sicher sind. Diese Studie empfiehlt außerdem alternative Bauweisen und alternative Finanzierungsmodelle, um die Erschwinglichkeit dieser Wohnprojekte zu verbessern.

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Chapter 1: Introduction

1.1 Research Background

The motivation for this research emanated from my search for solutions to the problems of uninhibited decaying of housing which I observed while I grew up in Enugu city. During this period, I lived in various parts of Enugu and commuted to some other. I also studied and worked on housing-related projects in Enugu. The Enugu state government (just as obtainable in other states in Nigeria) continually develop and deliver affordable housing schemes in the urban parts of Enugu state and a few satellite towns bordering Enugu urban. "What have given Enugu urban its present form have remained the various layout plans and schemes by Town Planners and which have been approved and implemented over the years" (Iyi, 2014a). However, these housing estates are alarmingly decaying. Those observable housing decays in Enugu often trigger the tendency to address those decaying housing estates as slums.

While this slum tendency persists, the population of Enugu urban which is predominantly a low-income population (World Health Organisation, 2022) has increased steadily. It has grown from 165, 680 in 1971 (Population City, 2015) to 847, 000 (Population Stat, 2023). This population growth could be one of the causes of the current land scarcity and the consequent housing deficits and rising unaffordability in Enugu (Uwaegbulam, 2022). However, the few already-built affordable housing estates have continued to deteriorate. Hence, "people have found themselves relegated to living in unsafe and unsanitary conditions" (Arimah, 2010).

1.2 The study area (Enugu, Nigeria)

The study area for this research is Enugu, Nigeria (fig 1). Nigeria is made up of 36 states. Enugu state is one of the states. Enugu usually refers to either the city of Enugu (covering 3 local government areas), referred to as Enugu Urban, or the state of Enugu (covering 17 local government areas), which encompasses both the rural and the urban areas. This study focuses on Enugu urban only. Hence, this study covered only 3 local government areas, namely: Enugu East, Enugu North, and Enugu South local government areas. Enugu City has a household size of 773, 000 (Macrotrends, 2020). Enugu City has a land area of about 90 square kilometers. Enugu City is made up of a mix of privately owned lands/housing developments and state-owned lands/housing developments.

The intent for developing most state-owned housing estates was to provide affordable housing to the citizens and to eliminate slums. However, slums can still be found within Enugu city despite the government's agelong development history through comprehensive urban planning. As can be deduced from Iwuagwu & Iwuagwu (2015), the existence of these slums in Enugu can be associated with the government's failure to achieve the target housing needs of the teeming population.

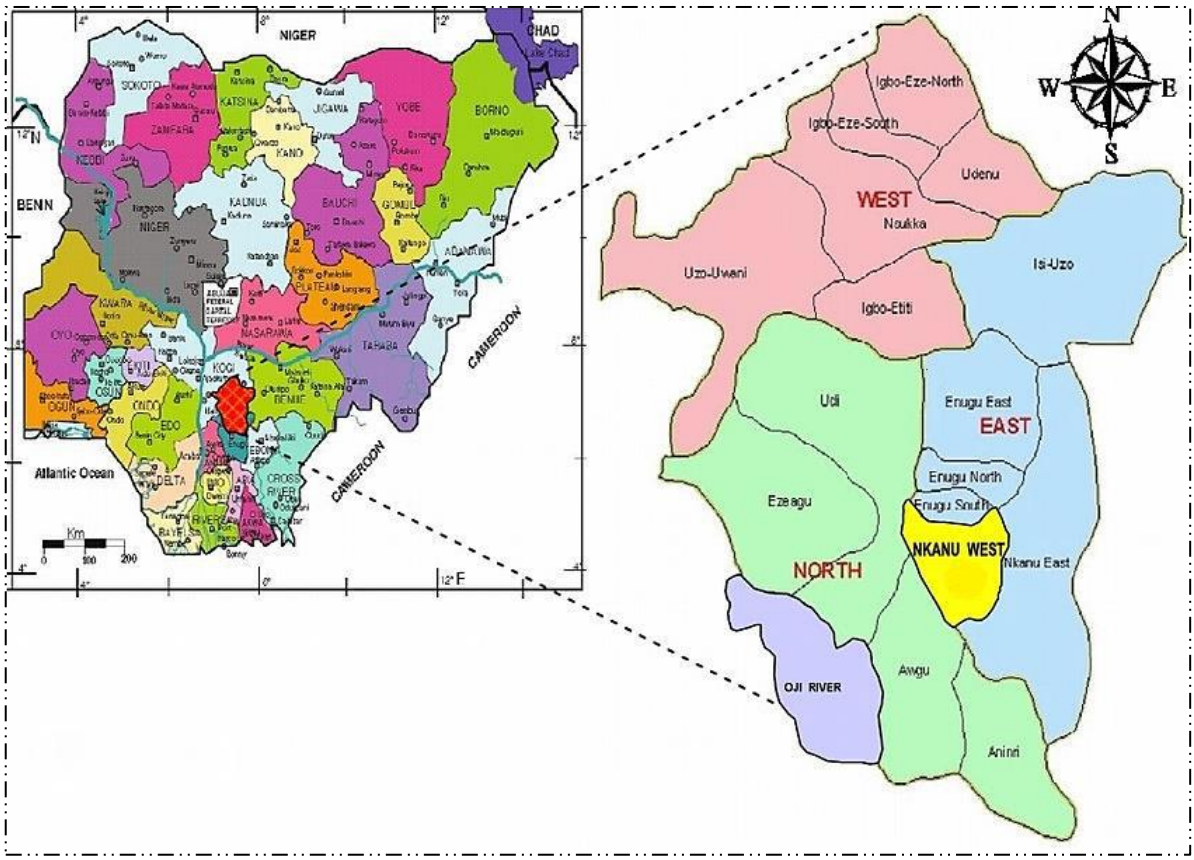

Figure 1: Map of Nigeria showing Enugu State (Lewis, Chukwudi, & Okonkwo, 2015)

1.3 Problem statement

In Africa today, in most cities and towns, "a twin development process is occurring wherein formal and informal cities are developing in parallel" (Bah et al., 2018). In Nigeria, just as found in Enugu, most of the urban population lives in a dehumanizing housing environment, while those with access to average housing do so at exorbitant costs (Iwuagwu, Onyegiri, & Iwuagwu, 2016). A recent study based on the salary structure of public servants in Nigeria showed that "no public servant in Nigeria (including Enugu) below salary grade level 13 in the federal civil service, and salary grade level 16 in the state civil service, can afford a property valuing N4.75m (12337.662USD) on a 25 years mortgage at 6% if he devotes 50% of his salary

per annum to housing" (Ugochukwu & Chioma, 2015). Although this claim is nearly a decade old, it is a pointer to the glaring poverty tendency in Enugu and across Nigeria and the concomitant choice of poor-quality housing owing to the unaffordability of good-quality housing. However, the present housing difficulty in Enugu, Nigeria arises not only because of poverty but also because of the absence of effective leadership with the will to appropriate the human and natural resources of the state for housing and urban development (Iwuagwu et al., 2016). Iwuagwu & Iwuagwu (2015) further recorded some Nigerian government's affordable housing schemes and showed how the various government regimes could not achieve the target housing demands in each case (table 1). This has contributed to the biting housing deficiencies in Nigeria as is also felt in Enugu particularly.

PERIOD	TARGET	ACHIEVEMENT
1962-1968	Construction of 61,000 housing units.	Only 500 units, less than 1 percent of the planned units were constructed.
1971-1974	Construction of 59,000 'low-cost' housing units across the Federation.	7,080 housing units representing 12% of planned houses were built.
1975- 1980	Construction of 202,000 low-cost housing units nationwide.	30,000 housing units representing less than 15 percent of planned houses were
1981- 1985	Construction of 160,000 housing units, for low- income people The second phase of the housing program set out to construct 20,000 housing units across the country	A total of 47,234 housing units representing about 23.6 percent of planned housing units were constructed in the first phase. The second phase was cut short by the military coup of 1983.
1986-1999	Construction of 121,000 houses on Site- and -Services housing program	5,500 housing units (less than 5 percent) of planned houses were constructed.
1999-2010	Construction of about 10,271 housing units through the Public- Private Partnership (PPP) arrangements in different PPP housing schemes across the country. Construction of 500 housing units in the Presidential Mandate Housing Scheme in all 36 State capitals and Abuja.	-2000 serviced plot through PPP site and service in Ikorodu, Lagos. -4,440 housing units completed in Abuja, Port Harcourt, Akure and Abeokuta, through PPP. -The Presidential Mandate Housing Scheme did not take off in many States. In Ogun State about 100 housing units representing 20 percent of the planned units were constructed.

Table 1: various government housing programs in Nigeria and their evaluated achievements (Iwuagwu & Iwuagwu, 2015)

Due to these recorded housing deficiencies, the number of people seeking access to housing has outnumbered the few available housing supply. For instance, there are 28,197,085 households throughout Nigeria (Nigeria Data Portal, 2017). For a population of about 200 million people, this means that at the rate of 5 persons per family (Nigeria Demographic and

Health Survey, 2013), only about 140 million people live in a house in Nigerian (including Enugu) – the rest are homeless. Yet, among those who live in a house, there are slums. Enugu, Nigeria, like the rest of the world's leading cities, has maintained a steady population growth. It is expected that the urban population will continue to grow so that by 2050, two-thirds (66 per cent) of the world's population would be urban while just one-third (34 per cent) would be rural (United Nations, 2014). This steady population rise in Enugu, Nigeria will pose some pressure on its existing housing supplies. This pressure could be in the form of overuse, vandalization, and change of use – these are predisposing factors to the generation of slums – a phenomenon called slum urbanism (Pieterse, 2013). Therefore, there is a need for a twin-track approach which prioritizes slum prevention and slum-upgrading programs for areas already affected by slums (Bah et al., 2018). Bah et al. (2018) suggests that slum can be prevented through improvement in the supply and affordability of new housing, while existing slums can be eliminated by implementing citywide and national slum-upgrading programs (Bah et al., 2018). Hence, the overall aim of this study is to proffer solutions for providing affordable housing that is slum-proof. Based on this overarching aim and guided by the stated problem, expanded research objectives (see section 1.4) which yielded three research questions (see section 1.5) emerged.

1.4 Research objectives

1. To investigate if there is/are connection(s) between affordable housing and slum emergence in Enugu, Nigeria.
2. To investigate if there are deficiencies in the affordable housing schemes in Enugu which cause slum emergence.
3. To recommend some measures that can be applied to help developers deliver slum-proof housing schemes in the future.

1.5 Research questions

This research addressed the following research questions:

1. How are affordable housing and slum emergence conceptually connected?
2. What are the deficiencies in affordable housing schemes in Enugu and how do they lead to the emergence of slums?
3. How can slum-proof housing schemes be used to improve the housing challenges in Enugu?

Chapter 2: The connection between affordable housing and slum emergence: a review from literature

2.1 Introduction

Chapter 1 posited that there is a decay of decently built affordable housing into slums in Enugu. This chapter looks at this issue from a theoretical perspective and discusses the link between affordable housing and slums. The goal is to find out whether there are some common attributes that slums and affordable housing share, which make those decently built affordable housing projects deteriorate into slums later. Answer(s) to this question would be used to derive a conceptual framework around which this thesis revolves. Thus, the question which this chapter addresses is: *"how are affordable housing and slum emergence conceptually connected?"* The key themes in this question (as well as in this research) are "affordable housing" and "slums". Therefore, to answer the connection between affordable housing and slum, the respective meanings of affordable housing and slum need to be unpacked. This unpacking was done through a literature review of various definitions by different authors.

First, a desktop study (secondary sources) was conducted to determine the respective meanings of the key terms ("slums and affordable housing"). Secondary sources in this study included (but were not limited to) Google searches, scientific journals, newspapers, and science repositories but did not include direct interviews or questionnaires. Further materials were drawn from bibliographies of some of the selected literature to make an in-depth study of the key terms under review.

In searching for the meanings of these key terms, most literature usually addressed them by providing their definitions. However, mere definitions are not always sufficient to communicate the complete meaning of a topic or term (Fearon, 1999; Hanks, 2000). Hence, additional sub-sections under each key term were introduced to help explain each term better. Through a combination of definitions for each key term and their sub-sections, a link between affordable housing and slum emergence was established to form the conceptual framework for this research.

Therefore, this chapter contains three sections. The first two sections discuss the individual meanings of "slum" and "affordable housing". The third section shows the link between slums and affordable housing – as derived from the definitions. This derived link between slums and affordable housing forms the operational conceptual framework for this research.

The context of this research is to view affordable housing as "clean and decent" while viewing slums as the opposite.

2.2 Affordable housing

The standard definition for affordability is that 30% of a household's income or less should be able to pay for housing, including utilities (Danko, 2013; Pivo, 2013). Since the late 2000's, a lot many scholars have differed greatly from this definition while trying to provide a more appropriate definition for affordable housing. Bergenstrahle (2018) argued that no matter how expensive a house may be, it is affordable to some people. On the other hand, some people cannot afford any house unless it is for free. This means that what is affordable to one person may still appear unaffordable to another person. Thus, currently, experts discuss affordable housing in terms of people who have some sources of income and how much of their incomes they are willing to spend on housing – it does not include people without any source of income. Housing that is provided for those without income can be referred to as social housing (Reeves, 2005). For specificity, fig. 2 differentiates affordable housing from social housing.

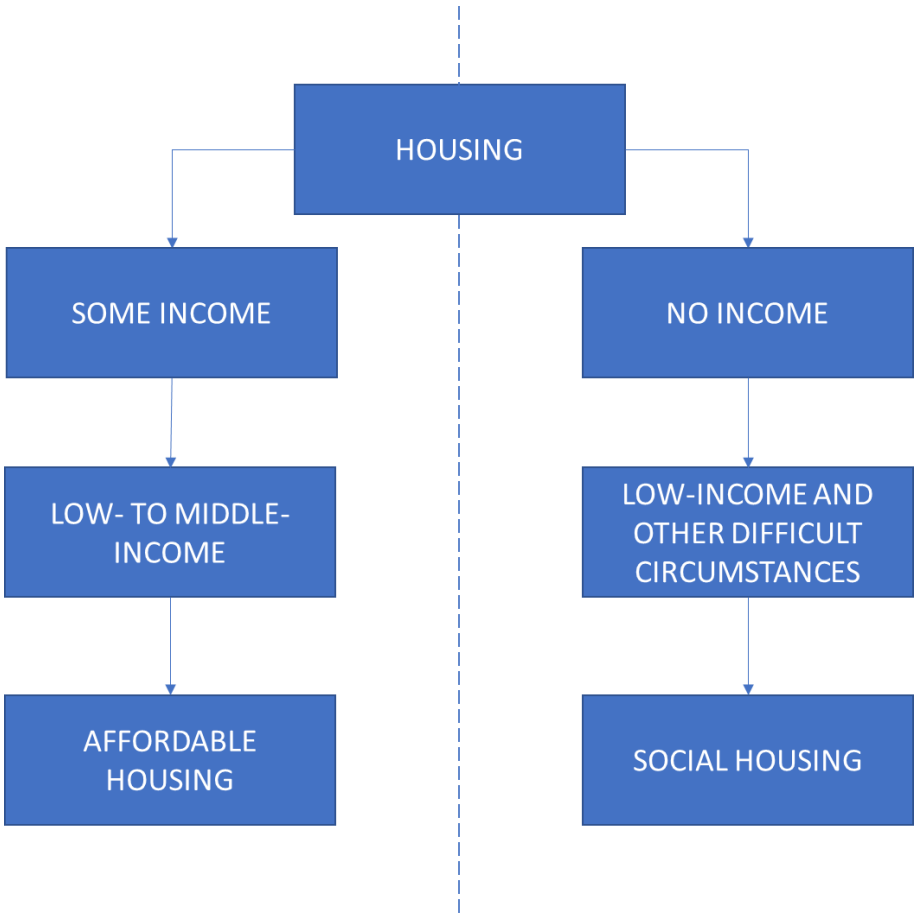

Figure 2: differentiation between affordable housing and social housing (Author, 2023)

Based on the income relationship, O'Neill et al. (2008) define affordable housing as housing which low and moderate-income households can access within their incomes and still be able to meet their other basic needs. Similarly, Bergenstrahle (2018) posits that housing is affordable when a household can still provide their other non-housing needs after paying for the house. As opposed to Danko (2013) and Pivo (2013), O'Neill et al. (2008) and Bergenstrahle (2018) do not talk about percentage (30%) of peoples' incomes but simply talk about households' incomes and the incomes' capacity to pay for housing and still pay for other needs. Thus, affordable housing is a decent dwelling in a good location whose cost does not hinder its occupants from meeting other basic needs, including their enjoyment of basic human rights (Menon et al, 2019; UN-Habitat, 2011).

The various perspectives (as above) from which affordable housing has been defined show that affordable housing does not mean cheap housing. "Cheap" could connote a compromise on quality. Therefore, even if the housing is affordable, it should still be of good quality. This "good quality" is what distinguishes affordable housing (decent) from slum housing, even if the slum housing appears affordable. Thus, housing providers concern themselves with finding a balanced mix of affordability, decency, and space adequacy in housing delivery. Depending on the context, housing providers try to achieve this balance by exploring possibilities for: choice of affordable construction materials, legal allowance to build without deadline (incrementally), or ability to finance gradually (mortgage).

2.2.1 Choice of construction materials

Construction materials vary in their chemical and physical properties, which determine their uses, prices, qualities, and durability. Attention to the type of construction materials is important in reducing the cost of housing when delivered. As studied by Qayyum et al. (2018), an approach to housing cost reduction is substituting luxury features and fixtures in the house with durable, non-luxury (lower cost) alternatives that can still perform the same use function as the luxury material. For instance, a wall can be built of clay bricks, sandcrete blocks, concrete, or timber. Therefore, the low cost of each material is not always because it is low in quality. Hence, alternative building materials are applied to reduce the cost of housing such that the owners/users can afford them within their incomes and yet have enough money to be able to cater to other needs (Bergenstrahle, 2018). However, care must be taken to choose alternative building materials correctly. An example of incorrect substitution is using a material meant for internal parts of a building on the external just because the cost appears lower. There

could be a quicker decay or breakdown of such material owing to its exposure to harsher conditions (heat, rain, or wind) than it was designed to withstand. If the users or owners of the house cannot cope with constantly repairing the worn-out parts of the building, decay gradually occurs and can multiply into a slum proportion. Therefore, if the developer cannot still finance the housing, having chosen the cheapest materials, the quality and durability of the house may be compromised. To avert this compromise on quality and durability, housing development can be done in phases to allow the client the comfort of building as money becomes available – this phenomenon can be described as incremental housing.

2.2.2 Incremental housing

Incremental housing is a strategy based on a "progressive system, where construction is incomplete but in conditions of habitability" (Van Noorloos et al., 2020). This definition is influenced by the fact that people could have a certain ambition of owning a house of a certain mass and elegance but may not have all the money to build or buy the house at once. Such house ownership aspirants usually start small by building the house in fragmented stages. At some point, they can occupy the house while the uncompleted parts are finished later. Therefore, incremental housing can further be defined as a "gradual step-by-step process whereby building components are appended or improved by owner-builders as funding, time, or materials become available" (Urban Nouveau, 2013). In this approach, the clients are mostly directly involved in the financing and management of the project; and in this way, the costs of housing construction can be reduced, especially compared with the housing delivery by contractors (Urban Nouveau, 2013). An advantage of incremental housing is that the developer is not under time pressure to meet deadlines. However, the problem with incremental housing is that the house may remain uncompleted for so long, causing the already-built parts to break down. A multiple of this breakdown can turn a neighborhood into a slum. To avert a significant breakdown of already-built parts, a developer either borrows to complete the housing construction or buys already-built houses and pays up in installments. This borrowing or gradual payment is usually done under a housing mortgage scheme.

2.2.3 Mortgage

A mortgage loan is "an advance of funds from a lender to a borrower for the purchase of real estate" (State of New Jersey, 2011). Because average home prices range from 4 times the annual income in developed countries to 8 times in emerging countries (Ball, 2003; Rodríguez-Planas, 2018), mortgage debt is a key element to the homeownership (Rodríguez-Planas, 2018).

While incremental housing deals with the gradual building of the house as material becomes available, mortgage deals with the gradual paying of a housing cost as money becomes available – but within a definite time frame. In mortgages, there are other cost factors, such as interest rates, inflation, and appreciation indices, depending on the market situation. But this section is limited to looking at mortgages from the angle of installment payments for the convenience of the property buyer. Therefore, in mortgage, low-/middle-income people can access a property valued high because they are given an opportunity to pay off the cost in installments over a set time frame. Through mortgages, low-/middle-income earners can access high-quality housing without fear of compromise to quality; or living in uncompleted buildings.

All these approaches to affordable housing provision are applied to ensure that the housing being provided to the people is of good quality and can be accessed at convenient costs. However, not everyone can still access those housings, baring all these good strategies for housing provision discussed above. Housing deficit is one of the reasons people do not access decent housing (National Coalition for the Homeless, 2007). Apart from housing deficits, another reason for this housing inaccessibility is the very low incomes or no-income situations of the housing seekers (Fumnanya, 2016). Without social housing programs that can help low-/no-income people access decent housing, many people might move into slums. Therefore, squatter and slum housing is the housing solution for this low-income urban population (Ooi & Phua, 2007). Hence, the next section explains the meaning of slum to enable us to understand its correlation with affordable housing provision.

2.3 Slums

In Africa and Asia, where most of the world's largest slums are found (Friesen et al., 2019; Wee, 2019), people come to slums as an affordable housing option in their ploy to stay close to urban opportunities. "Some are in the slum and feel they are in the slum on a temporary basis only, and others are there and feel they are there to stay" (Seeley, 2007). Most scholars define slums by either their attributes/characteristics or by their causal factors. When viewed from their characteristics, authors identify certain features which, when present in a settlement, qualify a place as a slum. On the other hand, when viewed by their causal factors, authors discuss certain conditions or factors that predispose a settlement to turn into a slum.

By their attributes, slums can be perceived as illegal urban settlements on public land and usually grow over a period of time in a constant and sporadic manner yet are considered an

integral part of urbanization and manifestation of overall socio-economic policies and planning in the urban sector (Singh & Raj, 2014). Sequel to the definition of Singh & Raj (2014), often, the terms "slum" and "informal settlements" are used interchangeably in the literature (Mahabir et al, 2016). When viewed as an informal (illegal) settlement, slum dwellers are perceived as holding their properties with high tenure insecurities (Durand-Lasserve, 2015; Sori, 2012). This is owing to the non-documentation of the developments taking place in the slums and their concomitant absence in the cadaster. However, there are instances where slum occupants are legally located there. This is due to the decay of residential areas that were once formally planned and built (Bbareui, 2015). An example is the case of existing housing developments turning into slums over time (as in some parts of Enugu, Nigeria). Hence, slums can also be defined as "an area, either legally or illegally occupied by a diverse group of people without access to safe water, adequate sanitation, secured tenure, and durable houses of permanent nature" (Oppong, 2016). Therefore, whether legal or illegal, the parameters used for urban slum classification are water source, accessibility types, wall materials, conditions and types of waste disposal, roof and roof trusses types, and cluster nature of the areas (Usman Badaru et al., 2014). Thus, the UN-Habitat (2006) defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following:

1. Durable housing of a permanent nature that protects against extreme climate conditions.
2. Sufficient living space which means not more than three people sharing the same room.
3. Easy access to safe water in sufficient amounts at an affordable price.
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
5. Security of tenure that prevents forced evictions.

While the above descriptions of slums are based on their characteristics, some other scholars have defined slums by their causal factors. Bah et al. (2018) posit that slums are generally the result of a combination of rapid urbanization and demographic growth, bad policies, and inappropriate incentive systems including poor governance, inappropriate regulatory frameworks, dysfunctional housing markets, and a lack of political will. For Laing (2014), colonialism, poverty, poor planning, poor governance and climate change are the causal factors of slum formation. Oppong (2016) further opines that causal factors of slum formation include rural urban migration, conflict and civil war, poor urban planning and lack of secured tenure cause slums to emerge. Ooi & Phua (2007) believe that "squatter and slum settlements have formed mainly because of the inability of city governments to plan and provide affordable

housing for the low-income segments of the urban population". Mahabir et al. (2016) sees causal factors of slum as location choice factors, rural-to-urban migration, poor urban governance; and ill-designed policies. Roy et al. (2014) identify population dynamics, economic growth, housing market dynamics, informal economy, local topography, street pattern, and the politics of slums as the causes of slums.

Although the selected various authors bear diverse perceptions about slum, some of them seem to agree on a few identified attributes and causes of slum. Such points most of them seem to agree on include rural-to-urban migration, poor governance, and poor planning. Sequel to such intersection of opinions, a simple definition of a slum would be "a heavily populated urban area characterized by substandard housing and squalor" (UN-Habitat, 2007). Slums do not just occur. They grow gradually till they attain a large span. Hence, there are stages through which slum growth passes.

2.3.1 Stages of slum growth

Turner (1968) classifies slum development into three stages: incipient squatter, semi squatter and provisional squatter settlements. Incipient denotes the beginning stage of the slum when the squalor is small and gradually emerging. Most of the people here have no land titles and they build their houses through self-developments which contravene development ordinances of a state. Semi-squatter denotes when a squalor has been noticeably shambolic. However, the occupants here have land titles, and the area mostly has a physical master plan. However, this spatial chaos is because the occupants develop their houses through self-help and self-financing only. Hence, most of them build incrementally and move into the uncompleted building to complete them later. The uncompleted buildings here are enormous that they become a slum in whole. The provisional squatters try to socket themselves as close as possible to urban opportunities by settling illegally around available properties. This settlement lingers till the settlers can find themselves more decent living standards. Some remain there permanently and develop a community of its own with its unique system. This is because slums, "rather than being disorganized often simply has its own organization, usually a type judged by the middle class to be unconventional" (Wangaruro, 1988).

Eyre (1972) identified four stages of slum development as (1) the initial occupancy, (2) the transitional, (3) stage of attaining secure tenure and (4) the stage of absorption. Eyre (1972) uses this classification to explain the phases a slum undergoes through time and use. At the initial occupancy stage, people simply move into an available expanse of land illegally and

begin to either cultivate or build on the land. At the transitional phase, more people will move into the same land expanse because they notice that the initial occupants have not been ejected. Their further incursion reduces the amount of land per capita for the slum occupants but their perceived tenure security increases. At the stage of tenure security, most occupants begin to formalize their occupancies by seeking titles on the parcels they occupy. This is because they have occupied these illegal properties for a while without interruption. At the absorption stage, the state or the relevant authorities incorporate (absorb) the slum into the state cadaster for having been accorded formality and can now exist in the cadaster as properties with secure tenure. Through this, they can be included in economic planning and property taxes. The absorption stage does not translate automatically into making the slum decent. However, this stage makes the process of sanitizing the slum easy as there will be clear delineation of properties according to ownerships and userships.

Abebe (2011), classifies slum growth stages into three: (1) infancy which can be understood as a stage when a neighborhood is gradually tending towards disorder by incursion of the first generation of illegal occupants; (2) consolidation further implies that more illegal occupants keep filling up the available spaces in an existing neighborhood and causing increasing problems in those places; and (3) saturation means, that there are little or no more available spaces to be filled up in the neighborhood, but more people keep coming in to settle in such neighborhoods by squeezing themselves into already occupied spaces.

While not much has been written about stages of slum growth, a few modern authors have adopted the classification of Abebe (2011). They include Sori (2012), Bbareui (2015), Aggarwal (2016), and Maula, Choerunnisa, & Akbar (2019). Noteworthy is that the classification of Abebe (2011) was done using the context of illegal occupancy and slum emergence from fallow lands but does not address slum emergence from legal and planned neighborhoods. However, a decent affordable housing can turn into slum due to decay of residential areas that were once formally planned and built (Bbareui, 2015).

In the context of slum emergence from a planned neighborhood, not all households that start a building or renovation process, can or will succeed (Urban Nouveau, 2013). This statement suggests that slum can emerge from neighborhoods bearing a significant number of uncompleted housing developments or unfinished renovations. Therefore, the starting point of slum growth is not always about people moving in to settle on a bare piece of land to expand from there; but rather, slum can also emerge from already occupied non-slum settlements

depending on the type of human activities that triggered the slum emergence. It is not uncommon in Enugu, Nigeria to find construction projects being abandoned mid-way into the construction and allowed to waste away (Nwanekezie & Nwanguma, 2019). In this situation, there is an intention to build a decent house or improve on a degraded building (in the case of those renovating their existing buildings), but this intention is not realized (Mrema & Mhando, 2005; Nwanekezie & Nwanguma, 2019; Otim et al., 2009; Richmond et al., 2016).

In summary, stages of slum growth imply that slums start small and gradually increase both in their land area and the population of their occupants, amounting to different degrees of environmental and spatial problems. Therefore, as slums grow, planners and policymakers decide on the right action to take based on the enormity of the slum and the available resources. In taking any chosen response action on the slum, people are either kept in their slum settlements to improve their living conditions (slum upgrading) or relocated to places with better housing conditions while a total rebuild of the evacuated slums (slum clearance) is conducted.

2.3.2 Slum clearance and slum upgrading

Some authors write that slum clearance and slum upgrading are the same: the similarity they share is that either of them can be applied at a certain stage of slum growth to address a unique problem. However, there are differences between the two. Slum clearance means the clearance of any slum area by the demolition and removal of buildings therefrom (Government of India, 1956). On the other hand, slum upgrading refers to improvements in housing and/or basic infrastructure in slum areas (UN-Habitat, 2014). Also, slum upgrading is the process of delivering place-based environmental and social improvements to the urban poor, including land tenure, housing, infrastructure, employment, health services, and political and social inclusion (Corburn & Sverdlik, 2017).

For slum clearance, although the good intent is to remove squalor and raise decent structures through proper planning, existing slum dwellers often risk uncompensated expropriation and forced eviction. This is due to the illegality and high tenure insecurities of occupancies in most slums. An approach to protecting people from uncompensated expropriation is the formalization of tenures. Payne (2000) describes 10 steps of achieving this formalization (fig. 3). These 10 progressive steps of formalization by Payne (2000) show different categories of informal settlement (from least to most secured tenures) till a full legality is attained. It is also built on the understanding that peoples' incomes or conditions will keep improving so that they

are able to afford better housing conditions as time progresses. This gradual process extends towards accessing better and decent affordable housing conditions either through renting or ownership as the slum dwellers' incomes improve. This journeying from slum to affordable housing is called "housing career" (Goetz et al., 2010; Skobba et al., 2013).

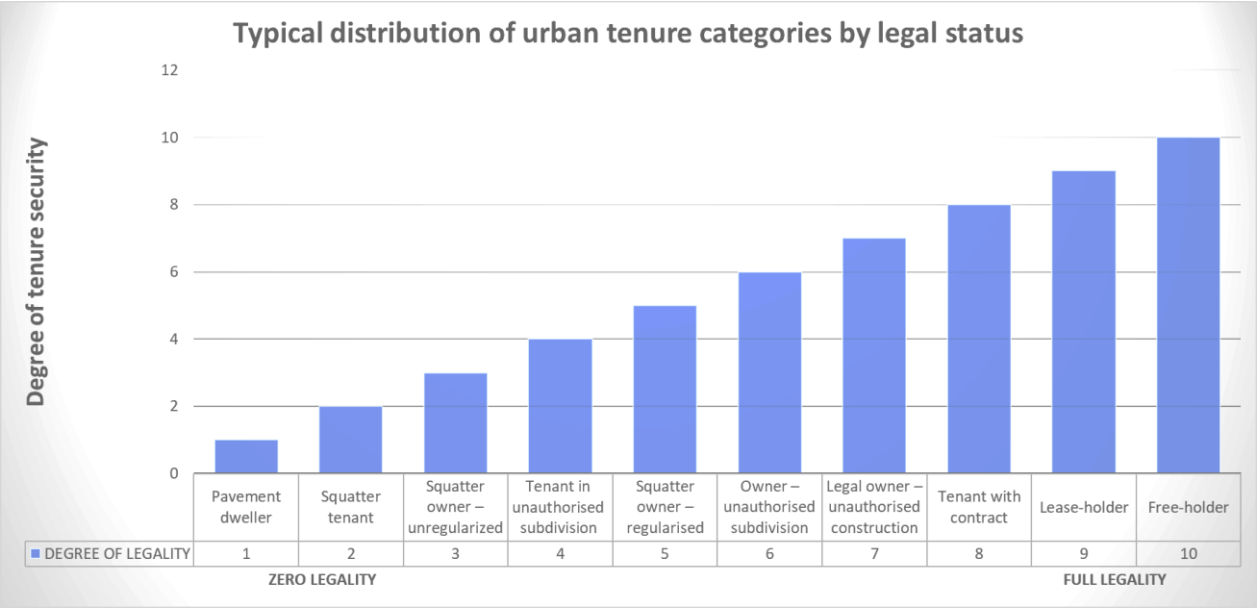

Figure 3: Typical distribution of urban tenure categories by legal status according to Payne (2000)

While people risk forced eviction and uncompensated expropriation in slum clearance, slum upgrading does not displace the occupants but rather keeps them while making some changes to their quality of life in the slum. Hence, slum upgrading concerns itself with ensuring that the lives of the occupants become better than they were before the upgrading exercise. The UN-Habitat, (table 2) describes 5 "key dimensions of improving slums" El-hadj M et al. (2018). These identified key dimensions of slum improvement suggest that slums are mostly defined by what they lack. What a slum lacks are usually the things a comfortable and decent housing has – including decency (see section 2.2).

In summary, slum clearance will remove the slum while slum upgrading keeps the slum but introduces facilities and services to improve livelihoods.

Access to safe water	A household is considered to have access to improved water supply if it has enough water for family use, at an affordable price, available to household members without being subject to extreme effort, especially for women and children
Access to sanitation	A household is considered to have adequate access to sanitation if an excreta disposal system, in the form of either a private toilet or public toilet shared with a reasonable number of people, is available to household members
Secure tenure	Secure tenure is the right of all individuals and groups to effective protection by the state against forced evictions. People have secure tenure when there is documentation that can be used as proof of secure tenure status, or there is either de facto or perceived protection from forced evictions.
Durability of housing	A house is considered durable if it is built on a non-hazardous location and has a structure that is permanent and adequate to protect its inhabitants from extremes of climatic conditions such as rain, heat, cold, and humidity.
Sufficient living area	A house is considered to provide a sufficient living area for the household members if not more than two people share the same bedroom.

Table 2: Five key dimensions of improving slums according to El-hadj M et al. (2018).

2.4 Conclusion: the conceptual link between slum and affordable

Although this research views affordable housing as "clean and decent" while viewing slum as the opposite, slum and affordable housing interrelate. Low income is central to both the people choosing slum dwelling and those choosing affordable housing options. Therefore, the commonality between slum and affordable housing is that people mostly seek both options because of their low incomes. A further link between slums and affordable housing is cyclic. From one direction, a slum can be rebuilt into a decent affordable housing or renovated to upgrade the slum condition (Turley et al., 2013). From the other direction, a decent affordable housing can turn into slum due to decay of residential areas that were once formally planned and built (Bbareui, 2015). An urban governance system is therefore only effective if it considers both aspects simultaneously.

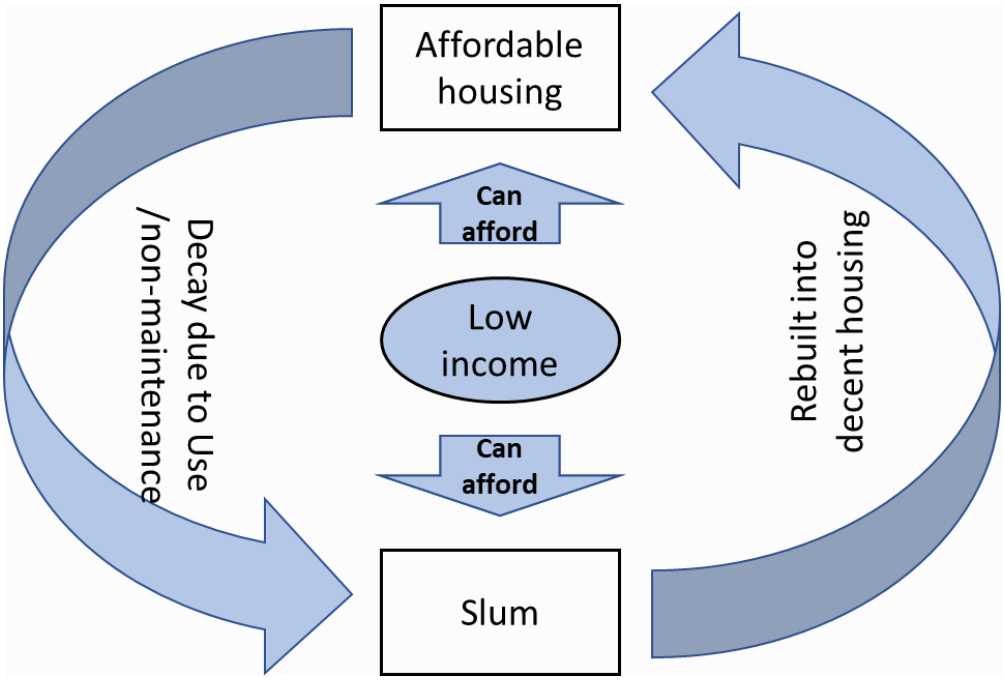

Figure 4: Conceptual link between affordable housing and slum in Enugu (Author, 2023)

The next chapters (3, 5, and 6) built the bases for addressing research question 2. Research question 2 says: "What are the deficiencies in affordable housing schemes in Enugu and how do they lead to the emergence of slums?" To understand the deficiencies in existing affordable housing schemes which lead to slum in Enugu, we need to understand how the Nigerian housing policy, which Enugu state uses, addresses housing provision, the housing condition in the study area, and the developers' opinions on affordable housing. Therefore, answers to research question 2 were derived as follows:

1. analysing the Nigerian housing policy to understand how the policy either aids or prevents slum emergence from delivered affordable housing schemes. The Nigerian housing policy was further compared with those of Ghana and Australia to draw insights from both a low-income country and a high-income country (chapter 3).
2. collecting non-expert survey data from the households in the study area about the housing conditions (chapter 5).
3. collecting expert interview data from developers who are active in the study area to understand their views on affordable housing (chapter 5)
4. analysing the collected data to derive logical conclusions (chapters 6 and 7)

Chapter 3: Review of the existing housing policies in Nigeria and the global south

3.1 Introduction

Chapter 1 posited that there is a rapid decay of decently built housings into slums while chapter 2 suggested that the central link between affordable housing and slums is "low incomes" of most of the dwellers. This chapter (3) analyzed the Nigerian Housing policy to understand its strengths and loopholes to be able to recommend amendments which would promote development of slum-proof housing schemes. Policy analysis is the "process of systematic investigation of the implementation (i.e., actions, decisions, executive orders, assumptions and objectives underlying actions and decisions, resources, instruments) and impact (i.e., changes in resources for households, changes in access to housing, changes in households, changes in crime rates, etc.) of existing policy (ex-post analysis), and of options for new policy (ex-ante analysis)" (European Training Foundation, 2018).

In conducting this policy analysis, this chapter (3) recognizes that Nigeria is a signatory to several international conventions on housing as a fundamental human right (Federal Republic of Nigeria, 2014; Tagliarino et al., 2019). About 90 percent of the Nigerian population is categorized as low income (Ojerinola et al., 2007). Therefore, the core focus of the Nigerian housing policy is on providing affordable housing for the low-income people in Nigeria. However, despite the existence of a housing policy in Nigeria, "there is a proliferation of slum populations in towns and cities in Nigeria because it is difficult for the general masses to afford or rent decent housing" (Saidu & Yeom, 2020).

Therefore, the essence of this policy analysis is to understand under which conditions, with which resources, and with which assumptions and objectives the governments are currently executing its strategies for providing housing to the low-income population. Outcomes of the Nigerian housing policy analyses were compared with the housing policies of other countries selected from the global south. "Global South" broadly refers to the regions of Latin America, Asia, Africa, and Oceania (Dados & Connell, 2012). This definition is only true for the "geographic" global south. However, economically, Australia (including South Korea, Singapore, and Japan) belongs to the "economic global north". Hence, they have a duality of being both "economic global north" and "geographic global south".

While these countries with the duality of being economic north and geographic south are high income economies (Statistics Times, 2020; World Bank, 2020), most countries in the economic global south are low- and middle-income economies. Therefore, the global south is characterized by the prevalence of lower income economies as well as emerging ones. While Nigeria is the largest population and largest economy in Africa (Statista, 2021a), it is a middle income (lower middle income) economy on a global scale (Fumnanya, 2016). Hence, it is a good idea to learn lessons from countries with better or similar economic situations as Nigeria. While there are many countries that fit into either similar or better situations as Nigeria, Australia, and Ghana were selected for review. The selections of Ghana and Australia for comparison with Nigeria were based on availability of information about their housing situations.

Additionally, the choice of Australia is because, among the high income countries with the duality of being "geographic global south" and "economic global north", Nigeria has a stronger immigration relationship with Australia than the rest (Statista, 2021b)**.** Hence, both countries have exchanged a lot of trades and cultures with each other. Secondly, both Australia and Nigeria are members of the Commonwealth Organization. Thus, exchange of policy opinions and lessons between Australia and Nigeria would be easier than from places with littler contacts with Nigeria.

On the other hand, Ghana was chosen because of the agelong political and trade relationships it shares with Nigeria. This could be attributed to the common colonial pasts shared by Nigeria and Ghana (anglophone). Therefore, Ghana and Nigeria share so many similar political and policy ideas. Sequel to these similarities, although on the map, there are two countries between Nigeria and Ghana (Benin Republic and Togo – fig. 5), Nigeria interacts more with Ghana than with those nearer countries. Also, both Nigeria and Ghana are members of the Economic Community of West African States (ECOWAS); and are both members of the Commonwealth Organization.

Figure 5: Map of West Africa (https://www.britannica.com/place/western-Africa)

The desideratum of considering similarities in selecting countries to compare with Nigeria is because change is a gradual process and are better perpetuated through a gradual introduction of familiar alternatives pending when an assertion of a radical overhaul is possible. This comparison will also enable us to understand how the policies address slum prevention and provision of affordable housing to (low/middle income and no income) people. This policy comparison will further guide the research in formulating which issues to look further into while investigating the causes and effects of slums; as well as the impact of housing policies on them. A policy analysis framework was used to conduct this policy review.

3.2 Policy Analysis Framework

This policy analysis adopts the analytical framework of the European Training Foundation (2018) as shown in fig 6. The European Training Foundation (2018) provides four steps of policy analysis:

1. Step 1 is to frame and understand the "problem" – in this case, the problem is the policy's inability to address slums, housing deficit and unaffordability.
2. Step 2 is collecting "evidence" of the identified problem – in this case, literature review.
3. Step 3 is "interpreting" the evidence by relating it with the analysed policy.
4. Step 4 is to "update" the problem if something has changed about the problem over time.

However, step 4 is used only if necessary. In this research context, it is not necessary because the identified problem was kept constant; not variable. Therefore, this policy analysis was done in 3 steps: (1) problem, (2) evidence, and (3) interpretation.

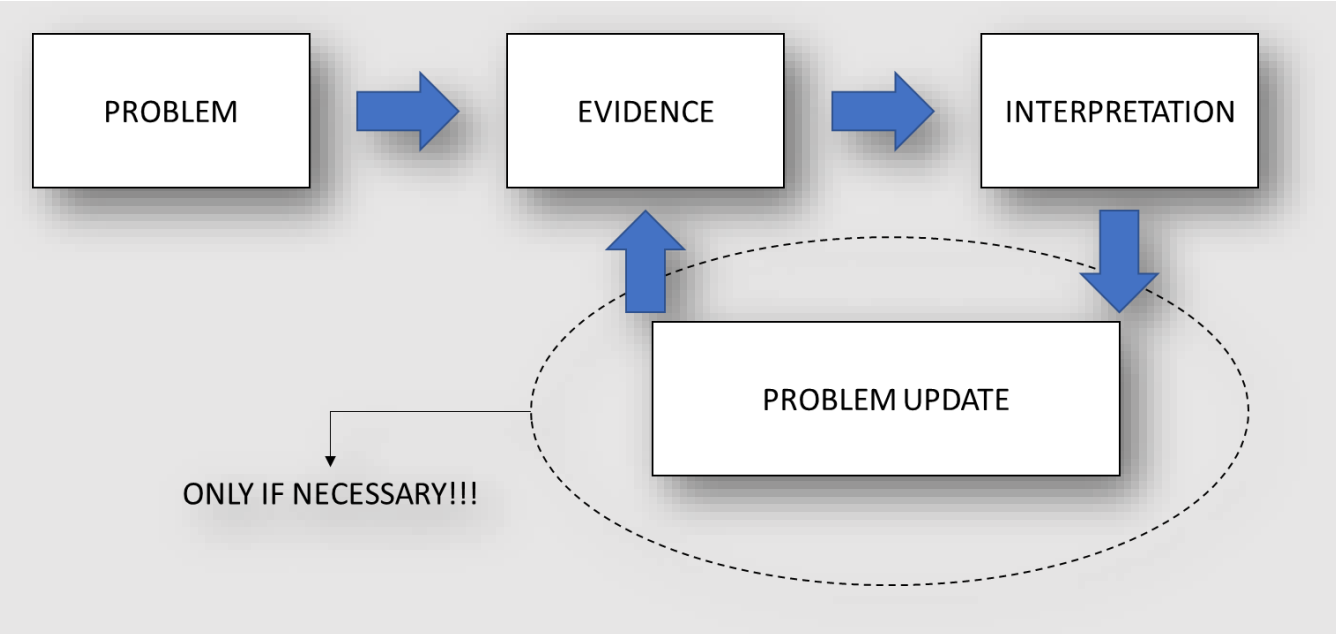

Figure 6: policy analysis framework according to European Training Foundation (2018).

3.3 Nigerian National Housing Policy (2012): an overview

The Nigerian housing policy has passed through 8 review timelines: the 2012 edition is the most recent version (Federal Republic of Nigeria, 2012). These various reviews were made to capture some previously neglected areas in housing development and supply. Thus, every new policy is supposed to be some improvements on the preceding ones. The 2012 version (section 2.8.3 – i and ii) of the Nigerian housing policy, took advantage of the then on-going millennium development goals (MDG's) to declare its development plan (vision 2020). The vision 2020 is a statement of goals which would be achieved through this housing policy by the year 2020. The vision statement therein is that: *"housing would be achieved through a private sector led housing delivery system anchored on mass construction of houses and strong mortgage finance"* (Federal Republic of Nigeria 2012).

This vison statement is further backed with an implementation statement which holds that: *"……10 million new houses to the national housing stock should be added by building an average of 1 million new homes every year; and ensure that at least 50 percent of the new homes are built in the urban centers and the remaining in the rural areas; and provide*

incentives to encourage Public Private Partnership (PPP) in mass housing development" (Federal Republic of Nigeria 2012). Backing the vision statement with an implementation statement (as above) shows that the Nigerian housing policy has both a plan (housing provision) and the strategies to actualize the plan.

Based on the implementation statement of targeting 10 million new housing units by 2020, Nigeria's existing housing deficit which has been estimated at up to 17 million units (Center for Affordable Housing Finance in Africa, 2020 - pp 192; World Bank, 2016) would have been reduced to 7 million by 2020. This simply means subtracting 10 million from 17 million to be left with just 7 million housing deficits. However, if the construction were to begin from 2012 (immediately after adopting the housing policy), by complying with the annual target of 1 million new houses (beginning from 2012), only 8 million new houses would have been built by 2020. This means that if 8 million is subtracted from 17 million, there would still be up to 9 million housing deficits in Nigeria by 2020 instead of reducing it to only 7 million. This further implies that there was a wrong calculation in the Nigerian housing policy such that even the policy action statement could not guarantee the actualization of the target 10 million new houses by 2020. Sequel to this policy calculation error, decent housing has over the years remained elusive in Nigeria especially to the low-income people who constitute an estimated 90 percent of the nation's total population (Ajanlekoko, 2001; Ojerinola et al., 2007). The extended implication is that the current housing supply in Enugu, Nigeria is yet insufficient while the available ones are not affordable (Belke & Keil, 2017; Cohen & Karpavičiūtė, 2017; Geng, 2018; Glindro et al., 2018; Sunde & Muzindutsi, 2016; Taghizadeh-Hesary et al., 2019). There is a need to understand the housing problems in Enugu better.

3.3.1 Understanding the Problems (of Nigerian Housing Policy)

To understand the problem with how the Nigerian housing policy addresses slum generation and affordable housing supply, the keywords, "slum" and "affordable housing" were checked in the soft copy of the Nigerian housing policy. Also, other possible synonyms of the search keywords were searched for. The synonyms for affordable housing as used here include "housing affordability", "social housing" and "low-income housing" while the synonym for slum as used here is "informal settlement". The essence of searching for those keywords was to know if the housing policy adequately discussed those keywords.

i. Step 1: The first step was a look on the table of contents to see if any chapter or section contains the terms, "affordable housing" or "slum", or any of their respective

synonyms. The Nigerian housing policy (2012) contains eleven chapters. Out of the eleven chapters, none bears "affordable housing" among the key terms in the titles of those chapter/sub-section. Also, none bears "housing affordability" or "low-income housing". However, "social housing" appears once in one chapter. Out of the same eleven chapters, none bears the term, "slum", and none bears the synonym, "informal settlement".

ii. Step 2: Absence of the sought-after key terms in the table of contents led to an in-depth word search (text mining) in the policy document. Therefore, the second step was done by conducting a simple text mining (word search) in the soft copy of the policy document to explore the presence of the interest key terms. Arising from the search, "affordable housing" occurred 12 times in the document. Among the synonyms, low-income housing appeared 6 times while "housing affordability" and "social housing" occurred zero (0) and 17 times respectively. "Slum" occurred 5 times while its synonym, "informal settlement" appeared zero (0) times in the search. Table 3 summarizes the search outcomes.

Key Terms and Synonyms	Number of Occurrences
Search by table of contents	
AFFORDABLE HOUSING	0
Housing affordability	0
Social housing	1
Low-income housing	0
SLUMS	0
Informal settlement	0
Search by the entire policy volume	
AFFORDABLE HOUSING	12
Housing affordability	0
Social housing	17
Low-income housing	6
SLUMS	5
Informal settlement	0

Table 3: word search for key terms in the housing policy (Author, 2023)

The number of times (12 and 5) which the keywords, "affordable housing" and "slums" appeared respectively in the Nigerian housing policy (2012) seems infinitesimal. This suggests that persistent housing deficit and slum (re)emergence could either be arising from poor implementation of the housing policy (Ojerinola et al., 2007) or from some lapses in the housing policy itself (fig 7). To be able to draw this conclusion, a further literature review was conducted to provide evidence to the claims.

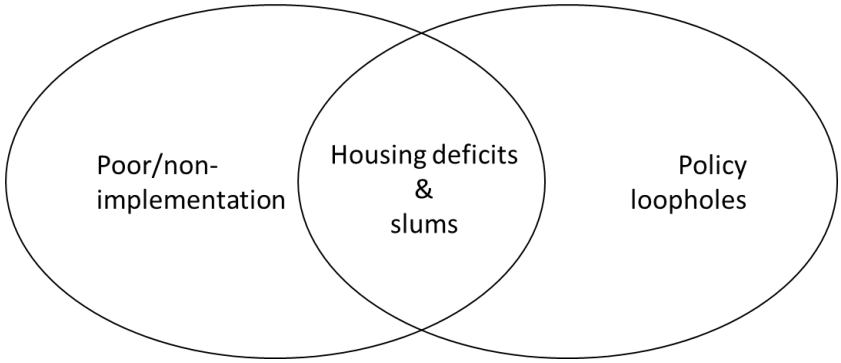

Figure 7: policy loopholes and poor implementation breed housing deficits and slums (Author, 2023)

3.3.2 Evidence 1: Poor or non-implementation of housing policy

Between 1960 and 2015, only about 14 percent of the housing units planned for construction within several government housing programs has been constructed (Ezennia & Hoskara, 2019). Sequel to this, Festus & Amos, (2015) suggest that housing inadequacy in Nigeria is partly caused by non-implementation of the de facto housing policy. In agreement, Ojerinola et al. (2007) opine that that there is a gap between the Policy objectives and Policy outcomes. For instance, the Nigerian Housing Policy stipulates that: "housings produced under this scheme should be targeted towards the low-and the middle-income groups" (Federal Republic of Nigeria, 2012). This is to ensure equal opportunities for both the poor and the rich to access decent housings. However**,** the bourgeois take over the whole low cost housing scheme built for the low income group (Obiefuna, 2012). Kalu et al. (2014) suggested that the Federal Republic of Nigeria does not monitor the implementation of its housing policy adequately, leading to a failure to forestall the allocation of low-income housings to the rich only. Therefore, the gap between the rich and the poor widen further due to how those state Agencies and the Federal Housing Authority handle the execution of government policies (Obiefuna, 2012). This takeover by the bourgeois is simply because the rich can outbid the poor in an unfair market competition to buy up the limited housing supply. Thus, wrong, or unintended outcomes (such as housing deficits, unaffordability, and slum generation) are obtained when the policy is not (well) implemented. Hence, people keep moving to new places in search of affordable dwellings. Some of these new/affordable dwellings could be found in the slums. These slums, apart from their squalid nature, have high degree of tenure insecurity. Secure tenure is the right of all individuals and groups to effective protection by the state against forced evictions (Payne & Durand-lasserve, 2012). When these individuals or groups cannot enjoy

this protection against forced eviction, they have tenure insecurity. Housing and land tenure share similar tenure attributes. This is because houses must be built on a land. Therefore, if a land has no tenure security, the house, no matter its high material quality, also has no tenure security. Therefore, just as one can be evicted from a house, one can also be evicted from a land.

Therefore, just as housing itself is a problem, acquiring land for housing is also a problem. Sometimes, acquisition of land for housing requires expropriation from the poor customary owners. However, some of these customary land owners may be forcefully evicted without compensation or they receive delayed compensation (Tagliarino et al., 2018). This contradicts with the intension of the land use act of Nigeria (1978) which was intended to facilitate availability of urban and rural land for development (Federal Republic of Nigeria, 2012). While the land has been expropriated without compensation, houses being built on those lands are also unaffordable to the displaced persons (Obiefuna, 2012; Oni-Jimoh & Liyanage, 2018; Tagliarino et al., 2018). People who cannot afford the high rent of housing in the urban centers tend to develop temporary houses within and around the cities where there are vacant and unclaimed parcels of land that are farther away from the core urban centers, thereby resulting in slums (Oni-Jimoh & Liyanage, 2018). Therefore, poor/non-implementation of the housing policy is evidenced in the increase in land and housing tenure insecurities which is a major attribute of slum and informal settlements.

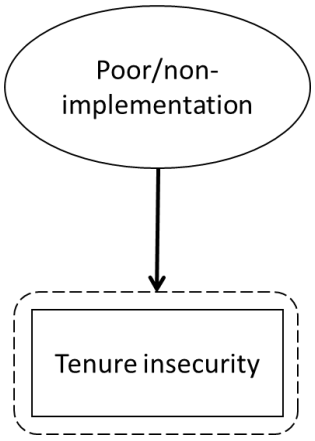

Figure 8: poor/non-implementation of housing policy as a breeding ground for tenure insecurity (Author, 2023)

However, the Nigerian Housing Policy (2012) anticipates unforeseen problems like those mentioned above and provides for the possibility to review the policy. This is to enable the

policy to keep up with times and trends. Thus, the Nigerian housing policy (chapter 11.4) provides that: "it is desirable to review the policy every four years" (Federal Republic of Nigeria 2012). However, since adopting the current housing policy, there has not yet been any review so made to address the lapses encountered in the implementation of the policy so far. Therefore, failure to review the de facto policy is also another major non-implementation issue. Consequently, some provisions of the current Nigerian housing policy may have been outdated and no longer effective. Therefore, there are some lapses and loopholes in the Nigerian housing policy.

3.3.3 Evidence 2: Policy Loopholes/Lapses

Apart from presence of outdated solutions in the Nigerian housing policy, there are other loopholes which make its implementation difficult. Adeshina & Idaeho (2019) posit that "the Nigerian Housing policies which have been directed in actualizing the goal of available and affordable housing for all have largely been unrealistic, unattainable and ineffective because majority of the people are low-income earners who cannot afford housing under the various programs, as well as high cost of capital". Olawale, Lawal, & Alabi (2015) remark that "although the objectives of the nation's National Housing Policies are laudable and take cognizance of the housing needs of the poor, these objectives are far from being met". In other words, many housing developments planned for affordability end up as unaffordable to the target groups.

To ensure a fair pricing for housing, it is recommended that cost-triggering factors should be controlled. Cost-triggering factors include but are limited to: land acquisition, high cost of building materials, lack of proper land regulation and policy (Center for Affordable Housing Finance in Africa, 2020). Building materials, for instance, make up 40 percent to 70 percent of total construction costs in Nigeria, depending upon the type, scale and quality of the project (Sunde & Muzindutsi, 2016; World Bank, 2016). Therefore, making building materials affordable and available could help encourage developers to complete their constructions. Consequently, chapter 3.2 (ix) of the Nigerian housing policy recommends the "promotion of the use of locally made building materials and appropriate production technologies by governments taking the lead" (Federal Republic of Nigeria, 2012; Ononugbo et al., 2010).

However, the Nigerian housing policy could not address the strategies for ensuring the availability and accessibility of those local materials at affordable costs. Therefore, local production of those building materials is low and expensive. Consequently, most of the

building materials used in Nigeria are imported and expensive especially when they are sold without any government subsidies (Ononugbo et al., 2010). Ononugbo et al. (2010) believe that "the adoption of European standard in housing construction and neighborhood development encouraged the substitution of indigenous materials with expensive imported building materials". This is because some of those imported materials are not locally available or are technologically expensive to produce locally.

While there are no, clearly defined strategies for ensuring availability and affordability of local building materials, there are also no legal consequences (sanctions) for not adhering to using local building materials – this also applies to many other aspects of the housing policy. Hence, implementation of the Nigerian housing policy is difficult.

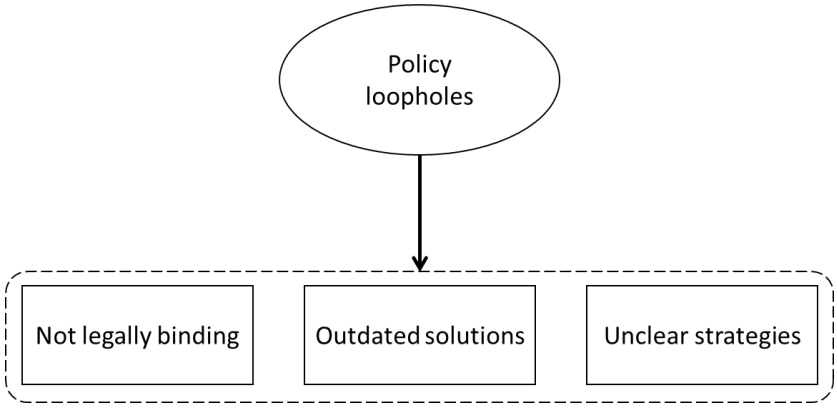

Figure 9: the many parts of the loopholes in the Nigerian housing policy (Author, 2023)

3.3.4 Interpretation

Sections 3.3.2 and 3.3.3 of this chapter (3) discussed poor/non-implementation and loopholes/lapses as the problems with the Nigerian housing policy. This section explains those problems further by demonstrating their impacts on slum generation and housing affordability.

Poor/non-implementation of the housing policy simplistically implies that housing problems (especially deficits and slum re/emergence) would keep rising if the identified problems remain unsolved. In essence, Nigeria's housing deficit which has been estimated at up to 17 million units (World Bank, 2016) would keep rising above this estimate. This further implies (as in fig 10) that more people would move into slums or other informal dwellings with high tenure insecurity which is one of the major characteristics of a slum. Currently, the Nigerian slum coverage is above 50% of the total urban area settlements and is likely to keep increasing (Trading Economics, 2021).

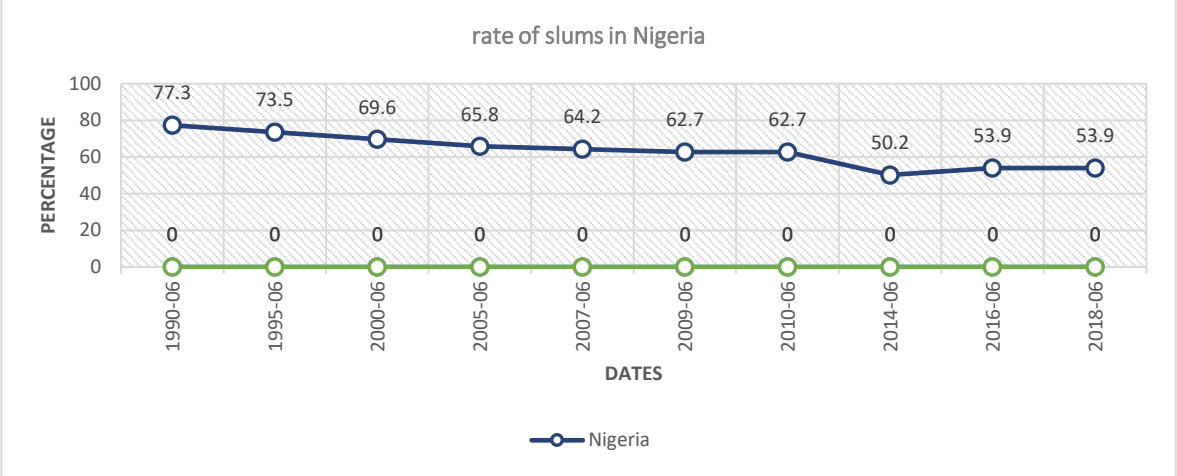

Figure 10: rate of slums in Nigeria according to Trading Economics (2021)

While poor/non-implementation of Nigerian housing policy correlates with the rate of slum re/emergence, loopholes/lapses in the Nigerian housing policy also contribute to slum re/emergence. Loopholes/lapses in the Nigerian housing policy could be resulting from outdated policy provisions. Outdated policy provisions are evident from the section 3.1.2 of this chapter where it observed that the current Nigerian housing policy has not been reviewed since its adoption. Also, loopholes are found when the policy has no clearly defined strategies for actualizing a purpose. Thus, development plans are executed through the discretions of the implementing stakeholders. One example of unclarity of strategies as identified in the Nigerian housing policy analysis [in chapter 3.2 (ix)] is the ambiguity around the use of local building materials. The policy does not address how to ensure that those building materials are locally produced. Sequel to this, projects that run on discretions rather than established frameworks have no guarantee of yielding the desired result. Furthermore, with discretions, people are more likely to deviate from the policy intent than when action plans are clear and specific. However, there are no legal consequences for not adhering to the policy dictates. Therefore, although the policy provides the citizens with the right to housing, those rights are non-justiciable and cannot be contested in the law court (Tagliarino et al., 2019). Similarly, some people who may have misappropriated the policy on the course of implementation could go freely without having to attract any legal sanctions. This is because the Nigerian housing policy is not a law but a mere voluntary guideline. As a mere voluntary guideline, the stipulates of the housing policy are not compulsory. Figure 11 summarizes the interpretations.

In summary, policy loopholes can be unpacked as: Not legally binding, outdated solutions, and unclear strategies while poor/non-implementation of the policy could lead to tenure

insecurity and perpetuate it. These inference from the Nigerian housing policy analysis combine to result into the central problem under study (slums and housing deficits).

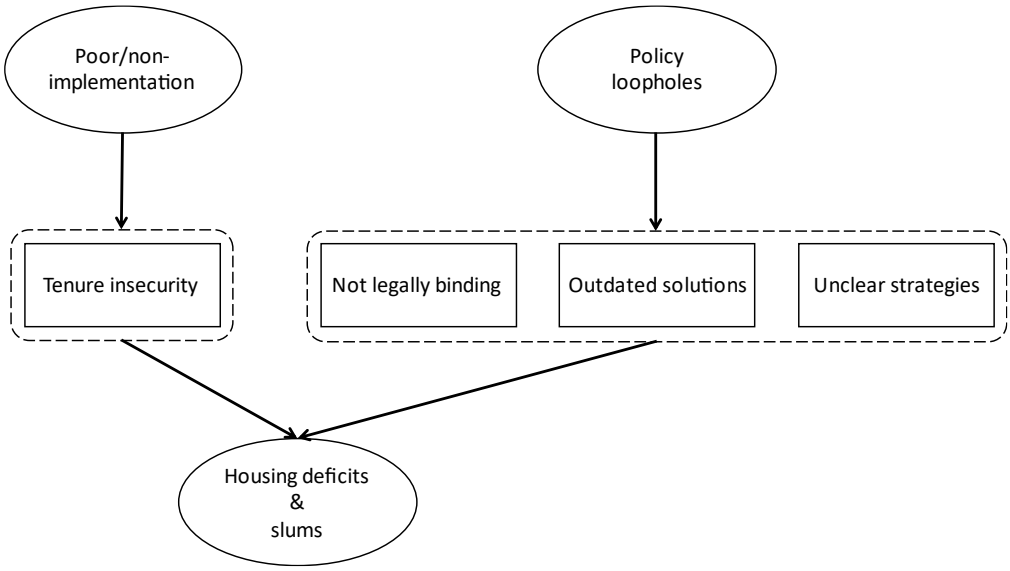

Figure 11: extended impacts of policy loopholes and poor policy implementation (Author, 2023)

3.4 Ghana and Australia's Housing Policies.

This section discusses the strengths and opportunities in Ghana and Australian housing policies which can be borrowed as lessons guiding recommendations for improving the Nigerian housing policy. Therefore, the scope of these comparisons is limited to the capacity of the policy to address slum emergence or re-emergence. Hence, this review focuses only on the strengths of the compared policies in relation to solutions to slum emergence and reemergence while ignoring their weaknesses.

3.4.1 Ghana Housing Policy: its capacity to address slum emergence.

In UN-Habitat (2006), slums are judged by the number of occupants (4 persons and above) per room. This suggests that 3 people and below are required to occupy a room to achieve a non-slum situation (provided the housing is decent and tenure-secured). Traditionally, in Ghana, urban housing has been dominated by multi-inhabitant compound housing (Owusu-Ansah et al., 2019). Multi-inhabitant compound housing implies a housing typology consisting of several units sharing the same land space without delineation of boundaries according to persons or parties. Thus, "there is a high concentration of households in urban Ghana (around two fifths – 2.7million) occupying single rooms" (Government of Ghana, 2015). Apart from

its choice by poor households, single rooms are preferred by most unmarried young people as an affordable option in their early lives/careers. Ghana is a young population, with approximately 57% of the population under the age of 25 (Index Mundi, 2021). Therefore, most young people who move to the city in search of opportunities would rent single rooms as the first affordable housing option considering their low incomes and their less need for large accommodations. In the absence of these rooms in decent locations, slum would become an option. Thus, to control the spiraling of slums in urban Ghana, its housing policy recommends that: "to clear the shortfall in the number of rooms available for occupation in urban Ghana, at 2 persons per room, 1.7million rooms must be built" (Government of Ghana, 2015).

Observably, Ghana is clear about developing single-room accommodations to meet the needs of its predominantly young population who prefers single-room dwellings (rather than in flats or houses). Ghana's Housing Policy has also ensured to control the number of occupants of a room by specifying "2 persons per room". Having adhered to this vision so far, the majority of households in Ghana (42.1 percent) own their dwelling units while 29.7 percent are rent-free (Centre for Affordable Housing Finance Africa, 2021). This implies that Ghana's housing policy has successfully addressed the housing needs of its predominantly young and low-income population through its choice of housing scheme (single-room housing). Ghana further controls slum expansion by providing rent-free housing for its no-income population. Therefore, Ghana has recorded a steady drop in its slum rate and housing deficit through its policy implementation strategies (see fig 12).

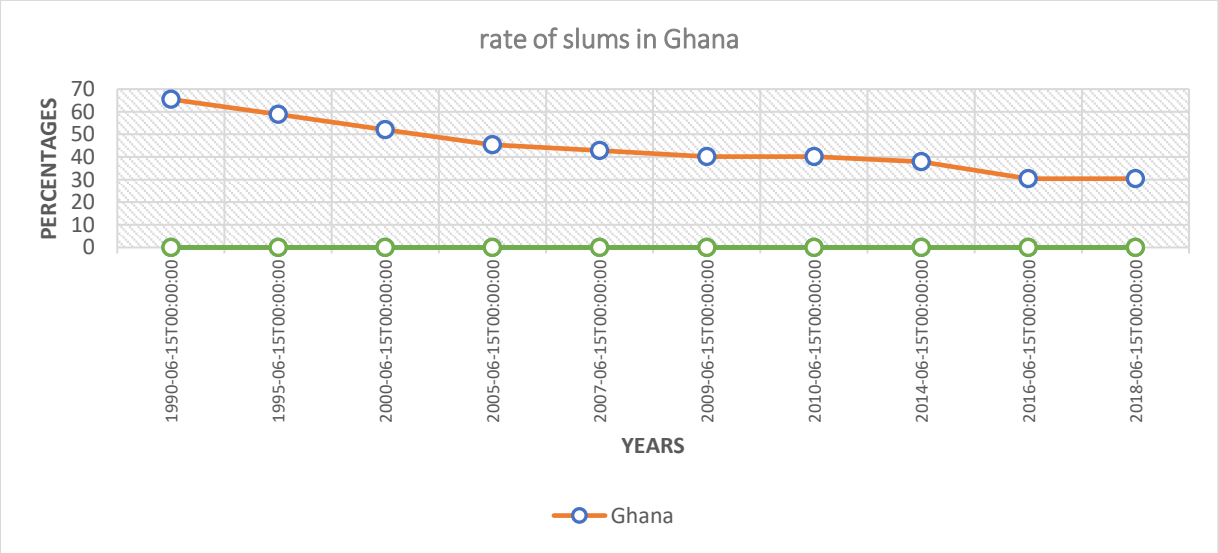

Figure 12: rate of slums in Ghana according to Trading Economics (2021)

Ghana achieved this drop in slums and housing deficit in two ways:

i. First, the Government of Ghana acknowledged that previous housing schemes which were deliberately targeted towards the urban poor turned out unaffordable to them. The Government of Ghana also understood that this housing unaffordability was founded on the absence of an "enabling framework" (Government of Ghana, 2015).
ii. Secondly, the Government of Ghana developed its housing policy by focusing on creating an "enabling framework". Enabling framework is a situation "whereby the state will play a less direct role in the housing sector in the future and encourage private sector developers, cooperative groups and other actors to take leadership in the delivery with the state facilitating equitable production and allocation" (Government of Ghana, 2015).

The enabling framework created made it possible that the urban poor (especially the no-income group) can be included in housing provision schemes. An evidence of inclusion of the urban poor in the affordable housing schemes of Ghana (post-2015) is its provision of rent-free housing for those no-income people (Centre for Affordable Housing Finance Africa, 2021). Also, this enabling framework offered the private developers an opportunity to compete among themselves to develop and deliver high quantity of housing units within a shorter time while making the housing prices lower due to increase in the quantity supplied. Consequently, more Ghanaians are moving into decent housing while the slums are shrinking in scale.

3.4.2 Australian Housing Policy: its capacity to address slum emergence.

Australia currently has no formal national housing minister, department, or policy (Martin et al., 2016). It does, however, have what might be called an implicit housing policy embedded in official stances on tax, monetary settings, retirement incomes, and finance sector regulation (ibid). What this implies is that Australia coordinates the affairs of affordable housing provision using a collection of bills, relevant laws, and government development agenda. For instance, under the three Labor Governments of 2007-2013, six persons in turn held a variously-configured housing portfolio expressly connected with social housing and homelessness (Martin et al., 2016). Therefore, with the absence of a deliberate housing policy in Australia, this review looks at how different laws guiding provision of affordable housing and social housing in Australia address slum generation.

In Australia, the two major approaches to the measurement of housing affordability in policy discussions are ratio measures and residual measures (Thomas & Hall, 2015). Ratio measures focus on the relationship between housing expenditure (prices or costs) and household income, either as a median or mean (ibid), while residual measures emphasize the capacity of a household to maintain an acceptable standard of living after housing costs (ibid). Affordable housing rents vary and are set either as a discount to the market rent or as a percentage of a household's income (New South Whales Government, 2021). This discount is usually paid for through Australia's government rent assistance scheme (Australian Government, 2021). Currently, over a million lower-income households are paying housing costs which exceed the commonly used affordability benchmark of 30% of household income (Australian Council of Social Service, 2021). However, this situation is not so severe when compared to the cost burden of many households in Nigeria, with about 14 million units of housing deficit. This is because those households in Australia whose housing costs exceed the affordability benchmark of 30% of household income receive subsidies which enable them to cope with their housing costs and other household needs.

Despite this minor severity of the housing cost burden and deficit, there is increasing fear in Australia that rents may rise faster than incomes (Yates et al., 2007). This warning is founded on the assertion that average weekly household expenditure on housing has increased from approximately 12.8% to 18.0% between 1984 and 2015 (Thomas & Hall, 2015). Thus, if the household expenditure continues to increase in Australia, it might hit an unbearable threshold which could force the people into living in slums.

Therefore, one could rightly infer that slums are controlled in Australia through proactive alerts to the responsible authorities, which spur them to act before the housing deplores. Hence, most scholars opine that Australia has no slums (ABC Radio Adelaide, 2016; Baker et al., 2016; Burton, 2020; Flood, 2003; Ritter, 2010; van Onselen, 2019). While the claim that Australia has no slums looks good, it is only a claim mostly from the lenses of its state-managed institutions. Some other non-state interests think otherwise and suggest that there are slums, especially in the settlements of most aboriginal citizens (Bourke et al., 2014; Latimore, 2017) Hence, Callanan (2021) refers to the slums in Australia as "slum pockets" based on the notion that slums are few in Australia. Therefore, this research aligns with the claim of "no slums in Australia" because the identified slum volume in Australia is less when compared with those of Ghana and Nigeria.

3.5 Discussion

Findings from the three reviewed housing policies show that each of the reviewed countries have their unique characteristics. With slum emergence as the core focus, existing data show that Ghana and Nigeria have high degrees of slums while Australia has no slums. Hence, a comparison of rates of slums was done only between Ghana and Nigeria. Based on the comparison (between 1990 and 2018), slums in Ghana are decreasing, while the slums in Nigeria are increasing (fig 13). Currently, Ghana's slum coverage is about 30%, while slum in Nigeria is above 50% (Trading Economics, 2021).

Having established that low income (chapter 2) is a commonality between slum dwellers and affordable housing seekers, Ghana developed housing schemes prioritizing its young population, which is the predominant group of its population. This is to ensure the affordability and accessibility of housing among the young population (target group). Ghana also delivers some of its housing schemes as rent-free dwellings to accommodate the no-income groups of its youthful population. The extended environmental impact of implementing these housing strategies in Ghana is the reduction of slums and homelessness among Ghanaians.

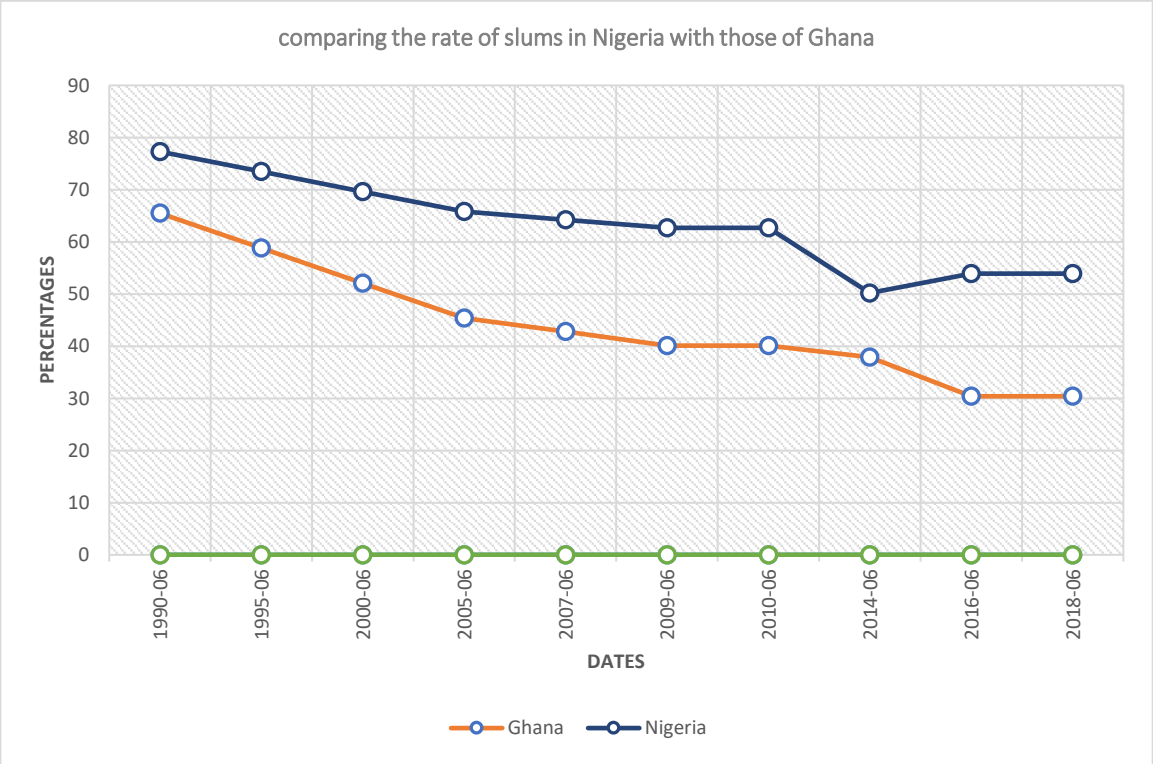

Figure 13: comparing the rate of slums in Nigeria with those of Ghana according to Trading Economics (2021)

On the other hand, Australia offers its housing to the target low-income groups at a maximum of 30% of their incomes. Those who cannot afford those houses at 30% (or below) of their incomes receive subsidies from the government through the Australian Council of Social Service. How it works is that the house buyers or renters offer their 30% which cannot pay for their desired housing (of a certain value). The remainder of that housing value is then paid by the government. With this approach to housing provision, Australia claims that it has successfully eliminated slums and homelessness within its territory.

In another context, Nigeria builds its houses as family dwellings and hardly as single-room apartments even though its population is predominantly youths. Housing deficits and slums keep increasing. A few housing delivered under the government affordable housing scheme are taken over by the rich and influential people. Hence, the low-income and the target groups for affordable housing provision do not get access to those houses. Also, the government's affordable housing scheme has no provision for no-income people. Hence, there are no social housing schemes, making it highly likely that more people with no income will keep moving into the slums. This aligns with the claim that Nigeria's slum growth is high and keeps increasing.

Table 4 summarizes the respective housing situations derived from the respective policy analyses of Nigeria, Ghana, and Australia and how each country tackles slum and housing provision.

Living Conditions	**Ghana**	**Nigeria**	**Australia**
Slums	Yes	Yes	No
Housing Deficits	Yes – decreasing	Yes – increasing	No – but imminent
Housing Affordability	Moderate	Not affordable	Affordable
Solutions			
Rental housing	Yes	No	Yes
Mortgage	Yes	Yes	Yes – affordable
Self-funded building	Yes	Yes	No
Home buying	Yes	Yes	Yes
Rent-free (no income)	Yes	No	Yes

Table 4: comparison of housing situations among Ghana, Nigeria, and Australia (Author, 2023)

Following from table 4 above, while the scales of slums and housing deficits in Ghana and Nigeria are high, Ghana has recorded a steady decrease while Nigeria keeps recording an increase. For Australia, housing policy which operates as a collection of several government

schemes has been very effective in keeping preventing slums while sustaining adequate decent housing supplies to the target population, at affordable costs.

3.6 Conclusion

In conclusion, the purpose of this chapter is to analyze the Nigerian housing policy; to understand its strategies for providing housing for the low-income population in Nigeria; and to understand what causes/d slum re/emergence arising from existing affordable housing schemes. A comparison was made with the housing policies of Ghana and Australia to understand what they (Ghana and Australia) did differently from Nigeria that might have made their housing schemes appear better in the aspects of affordability and slum prevention. Therefore, what can be understood from this analysis are as follows:

For the Nigerian housing policy, two problems deduced from the analysis are: (i) poor/non-implementation and (ii) loopholes in the housing policy. Poor/non-implementation implies that the implementation stakeholders did not adhere (or adhered to but not totally) to the stipulated guidelines for delivering affordable housing to the target groups (low-/middle-income). However, targeting only the low-/middle-income groups implies non-inclusion of the no-income groups. This non-inclusion of the no-income groups is one loophole in the Nigerian housing policy, which makes it non-compulsory for the policy implementers to develop housing for no-income groups. This same loophole of non-inclusion of the no-income groups extends to the possibility of most of them moving into slums (new or existing) where they can access housing. Therefore, loopholes in the Nigerian housing policy implies that some aspects of the housing policy make it difficult to achieve housing affordability, prevent slums and eliminate homelessness. Therefore, in Nigeria, slums and housing deficits/unaffordability have maintained a constant increase despite the existence of a housing policy.

Conversely, the housing policies of Ghana and Australia successfully addressed the problems of slums and housing unaffordability. For Ghana, it has successfully achieved access to affordable housing but only succeeded in reducing its slums without eliminating it totally yet. For Australia, it successfully achieved both access to affordable housing and the total elimination of slums.

To ascertain the reliability of the lessons learnt from these policy analyses and literature reviews (hypotheses), further field data were collected to either validate the hypotheses or to gain more knowledge into the possible causes of the spiraling slums which re/emerge from

delivered affordable housing schemes in Enugu, Nigeria. Further analysis of the data collected was also useful in determining the proper recommendations for improving the Nigerian housing policy.

Sequel to the issues raised in this chapter (3), the primary data collection focused on seeking answers to the causes of and solutions to:

1. Loopholes in the Nigerian housing policy
2. Poor/non-implementation of the Nigerian housing policy
3. Slum re/emergence in the delivered housing schemes
4. Housing deficits and unaffordability
5. Absence of social housing

Based on the focus of this data collection, target respondents were classified into two:

1. The housing development experts (include construction companies, government officials in the appropriate departments, construction professionals)
2. Non-experts/occupants of the delivered affordable housing schemes.

Chapter 4: Research Methodology

4.1 Introduction

A research methodology entails “the procedures by which researchers go about their work of describing, explaining and predicting phenomena” (Rajasekar et al., 2013). Also, research methodology is about “how a researcher systematically designs a study to ensure valid and reliable results that address the research aims and objectives” (Derek & Kerryn, 2020). This chapter (4) on “Research Methodology” describes the structure which was followed in collecting and analyzing the primary data for this research (fig 14). While figure 14 presents a generic research framework, figure 15 expands on figure 14 to present a detailed structure which was followed to conduct this research.

4.2 Research design

Answer to research questions 1 (stated in chapter 1) were derived through literature reviews only. Therefore, the answer was solely based on secondary data sources. Secondary data are the data that have already been collected by other sources and are available for use by other researchers (Management Study Guide, 2020). In this thesis, one could refer to the answer from the secondary sources as the hypotheses for this research as it helped to give some preliminary insights into the stated research problem.

A further investigation (relying on primary data sources) was conducted whose results would either test, validate or expand on the answers from the secondary sources. “Primary data are original and unique data, which are directly collected by the researcher from a source such as observations, surveys, questionnaires, case studies and interviews according to his requirements” (Ajayi, 2017). This implies that primary data are not collected from already published sources (books, newspapers, or journals) but rather are original to the researcher and are collected directly from a raw source.

The primary data collected were compared with those of the secondary sources (triangulation) to derive some interpretations (results). To conduct the comparison, results of the secondary data which formed the hypotheses were used as a guide to frame the questions for the primary data collection (both surveys and interviews). Additionally, the questions in the questionnaire were framed using the five attributes of slum (chapter 2) as guiding framework. This was to be able to deduce the extent to which the housing estates under study align or deviate from the attributes of a slum.

While the primary data was necessary to validate, confirm or expand on the hypotheses, some answers were best obtainable from the expert respondents while the others were best obtainable from the non-expert respondents. Therefore, rather than seeing expert data as corroborating the non-expert data, both data complemented each other to produce a single result that was useful in validating, rejecting, or expanding on the claims of the hypotheses (primary data). Questions of the primary data were framed to capture issues on housing management, slum, and housing affordability. Therefore, a check was done to see how the collected primary data match, closely align, or deviate from the claims from secondary data. Therefore, interpretations were done based on the results of those comparisons. Through those interpretations, some recommendations were proposed for ways of developing slum-proof housing schemes in Enugu. Those recommendations address answers to "research question 3" of this thesis.

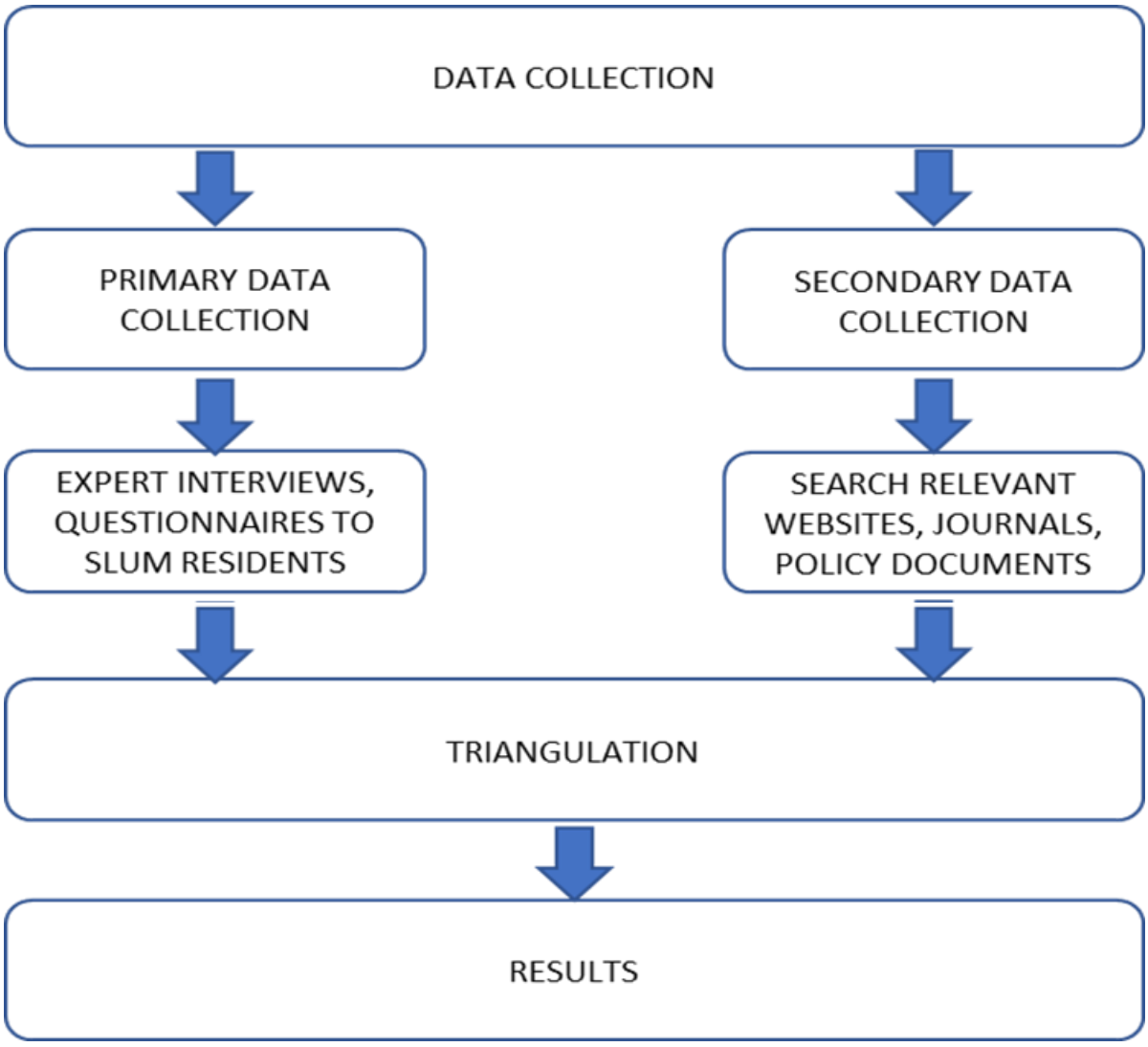

Figure 14: summary of research methodology (Author, 2023)

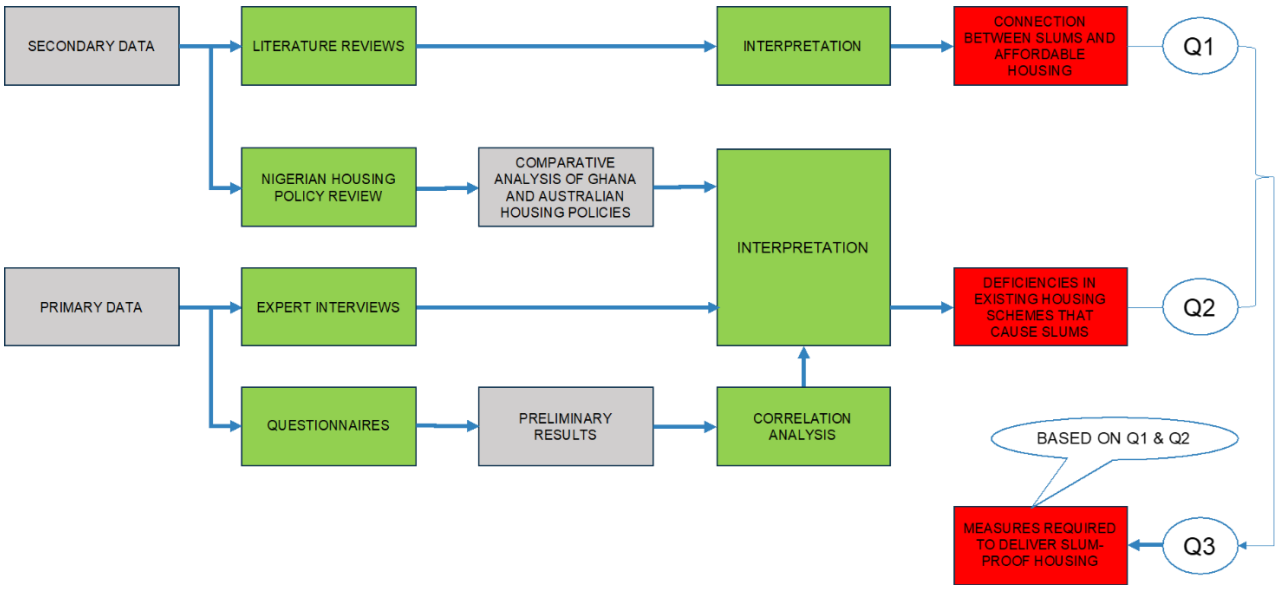

Figure 15: Research matrix (Author, 2023)

4.3 The case study approach

"A case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context" (Crowe et al., 2011). Also, "case study methodology enables researchers to conduct an in-depth exploration of intricate phenomena within some specific context" (Rashid et al., 2019). Collectively, these two definitions suggest that a case study recognizes that there can be various angles to a situation. They further suggest that case study would focus on specific aspects of that situation by looking into tiny details of that situation to unpack them into simpler terms. Thus, the specific focus of this research is on understanding the causes and effects of "decay and dilapidation" of some of the existing government housing estates in Enugu. This case study was conducted using qualitative data collection approach. There are broadly two approaches to research data collection: qualitative and quantitative data collection methods. "Qualitative research is a type of social science research that collects and works with non-numerical data that seeks to interpret meaning from these data that help us to understand social life through the study of targeted populations or places" (Mohajan, 2018). "Qualitative researchers are interested in people's belief, experience, and meaning systems from the perspective of the people" (Mohajan, 2018). On the other hand, "quantitative research methods deals with explaining of an issue or phenomenon through gathering data in numerical form and analyzing with the aid of mathematical methods; in particular statistics" (Apuke, 2017).

In simple terms, qualitative data collection seeks information using texts (description) while quantitative data collection seeks information using numbers (calibration). The nature of this research requires an understanding of the causes of decay of existing affordable housings in Enugu. Causes of those decays can further be categorized if they can be interpreted as having some classifiable characteristics. This implies that among the many responses from the sample population, some responses would exhibit some similarities that distinguish them from the other responses which share some other forms of similarities. Through this grouping of responses, the housing situation within the Enugu urban area as part of the urban governance system can be analyzed and interpreted.

4.3.1 The study area and justification: Enugu Urban (south-east, Nigeria)

Enugu is in the south of Nigeria. For administrative convenience, Nigeria is divided into southern and northern Nigeria. Each of the north and south of Nigeria is broken into three sub-regions or geo-political zones (fig 16). The geo-political zones of southern Nigeria include south-east, south-west, and south-south. Enugu is in the south-east.

Enugu can be perceived in two ways: (i) Enugu as a state and (ii) Enugu as a city. Enugu as a state is made up of both the rural and urban areas and is comprised of 17 Local Government Areas (LGA's). On the other hand, Enugu as a city is exclusively an urban area and is comprised of three LGA's – namely Enugu north, Enugu east and Enugu south LGA's (fig 16).

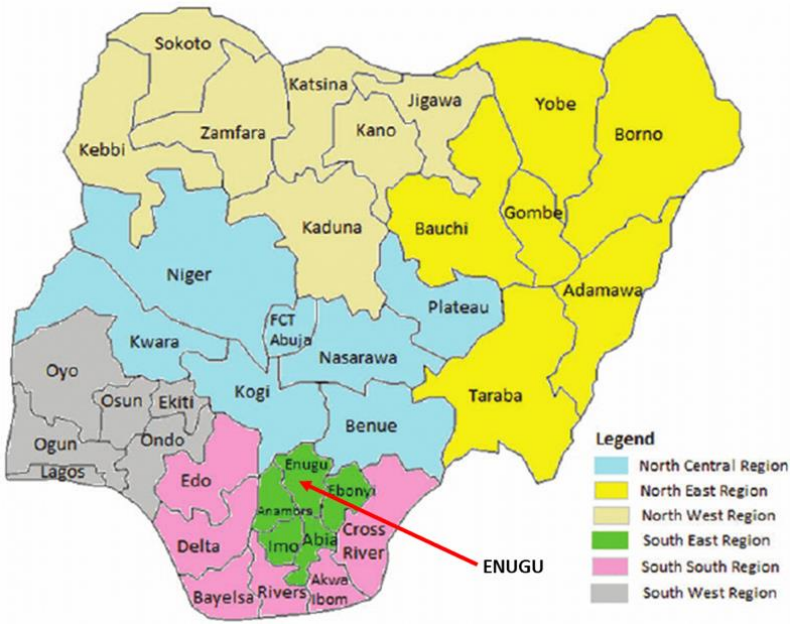

Figure 16: Six geo-political zones of Nigeria (Woles Theme, 2019)

The focus of this study is on Enugu as a city (figure 17). Enugu (city) was chosen because most of the government housing schemes in Enugu state are in the urban – out of the 66 housing estates developed and managed by Enugu state government, only 5 of them are in the rural – the rest are in the urban (see table 5). Furthermore, Enugu urban is preferred over the rural by most investors and developers because most businesses are attracted to places with high prospects of larger customer base than to places with lower number of costumer base. Consequently, the rural population is decreasing while the urban population in increasing in Enugu state (Ritchie & Roser, 2018; United Nations, 2018).

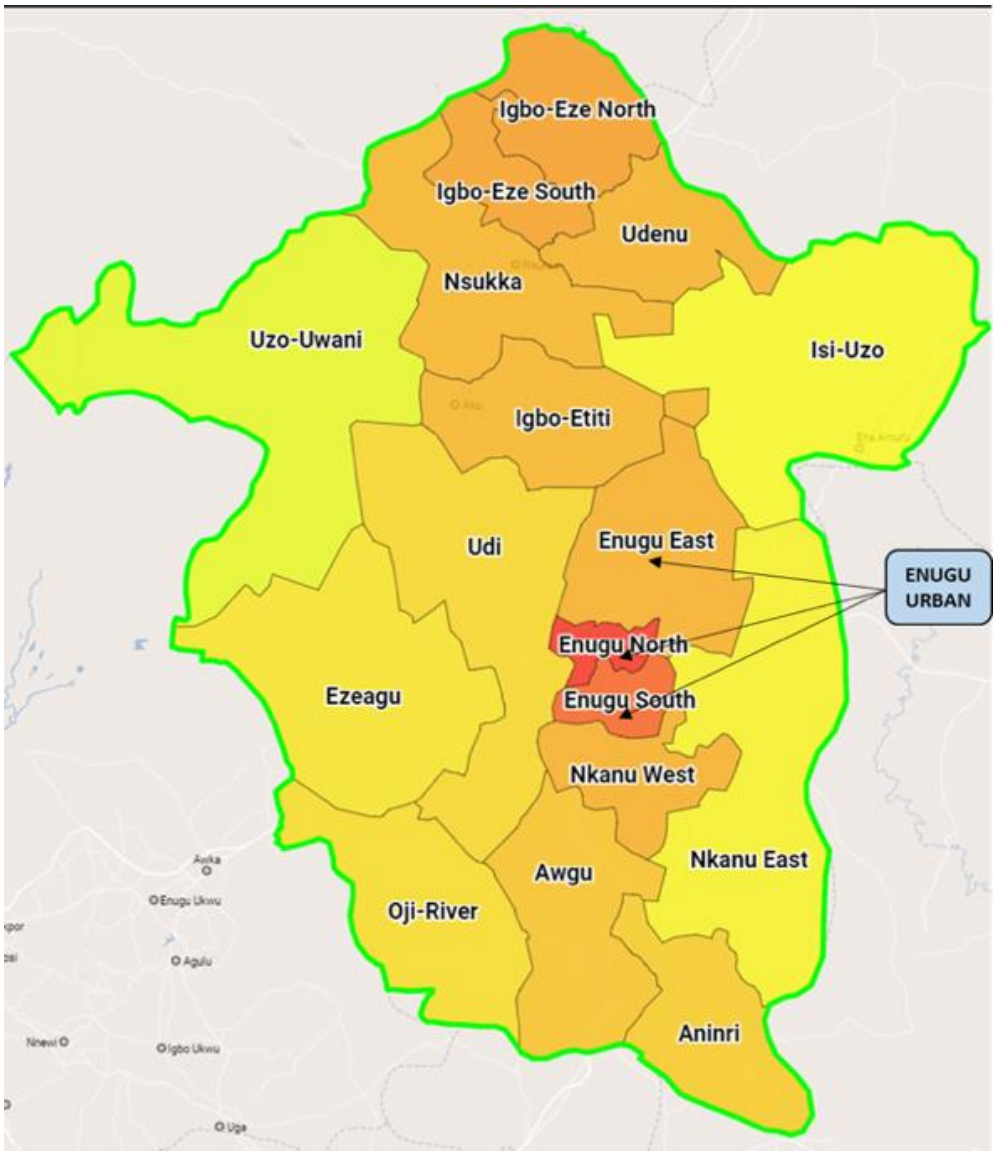

Figure 17: Map of Enugu state showing Enugu urban (City Population, 2021)

Attraction of businesses to Enugu urban over the rural can further be translated as increased demand for lands needed for development of infrastructures that support businesses, including housings to accommodate the seekers of economic opportunities in Enugu urban. To acquire lands, the possible tenure types that apply are either statutory or non-statutory tenures – this depends on the custodians/holders of such lands (AEC, 2004). The non-statutory tenure encompasses all tenure types that are not under the jurisdiction of the states (for instance customary and religious tenures). In Enugu (or across Nigeria), statutory and non-statutory tenures often conflict. Therefore, one can say that there is a pluralistic land tenure pattern in Enugu, Nigeria (Nwapi, 2016). Pluralistic land tenure implies that both the statutory and non-statutory tenures are operated in Enugu. However, using the power of "eminent domain", the government may take over the land if the state's interest is of priority over the private interests. Eminent domain is the right of the Central or State Government to acquire private property for public purpose (Wallcliffs Law Firm, 2020).

While the application of power of eminent domain appears simple, it is not straightforward as it does not always apply without some oppositions from the landowners/holders/users. In some extreme circumstances, violent conflicts requiring police or military actions occur – as in:

1. Aguleri-Umuleri land dispute (Obiakor, 2016)
2. Oruku-Umuode land dispute (Okechukwu, 2014)
3. Ezillo-Ezza land disputes (Michael et al., 2015)

Concerns for the cost, time, and other resources it takes to resolve some of these land acquisition hurdles restrict the government and other investors to fewer parcels of lands for housing in Enugu urban. One close evidence is the fact that urban Enugu is limited to just 3 Local Government Areas (LGA's) out of the 17 LGA's of Enugu state (figure 18).

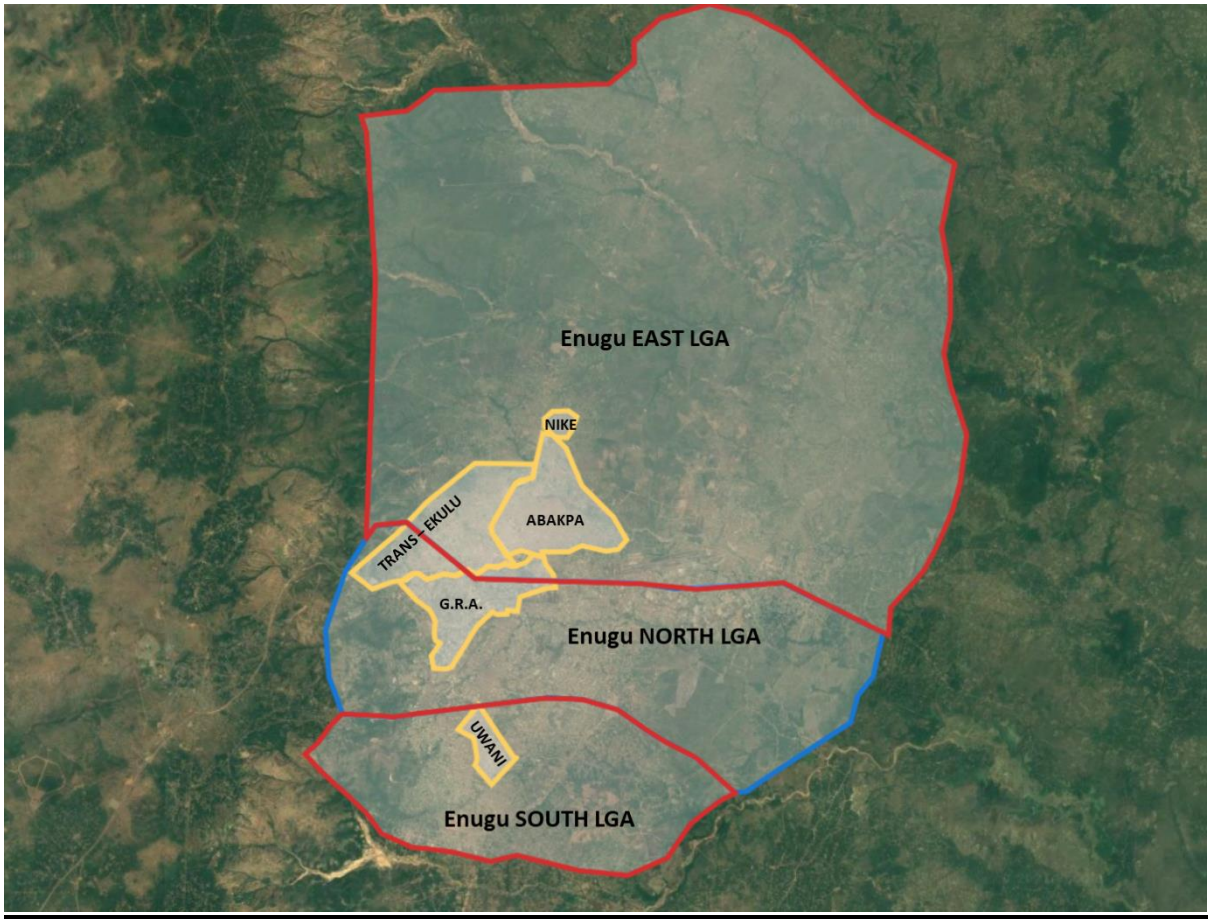

Figure 18: map of Enugu urban showing host-communities of government housing estates (google earth)

As can be seen from figure 18, although those estates are distributed across the three LGA's of Enugu urban, they seem to be located close to one another, and forming a quasi-common center within Enugu urban metropolis. Beyond this quasi-common center, human settlements in the rest of other parts of Enugu city are either privately-owned or customarily owned properties; or other housing schemes developed by non-governmental and private entities. This further implies that land for housing in Enugu has remained low in supply even as the population keeps increasing. Therefore, to ensure an efficient use of the limited land supply for housing, a masterplan of Enugu was proposed and developed by different government dispensations. Hence, "what have given Enugu urban its present form have remained the various layout plans and schemes by town planners and which have been approved and implemented over the years" (Iyi, 2014b).

The Enugu State ministry of lands is in-charge of acquiring and mobilizing lands for housing, roads, and development of other infrastructures (Enugu State Government, 2023). Based on the quantity of land available, the Enugu Town Planning Authority (ENTPA) designs and implements master plans for Enugu city (Enugu State Government, 2023). The Enugu Capital Territory Development Authority (ECTDA) supports the ENTPA in monitoring developments and enforcing the implementation of the Enugu city masterplan (Enugu State Government, 2023). On the other hand, Enugu State Housing Development Corporation (ESHDC) is in-charge of designing, developing, and delivering housing to the public (Enugu State Housing Development Corporation, 2023). As a second function, the Enugu state ministry of lands also participates in housing development to help ensure sufficient housing supply to the public (Enugu State Government, 2023). Also, there are numerous private housing developers in Enugu who acquire land to develop housing and deliver to the public.

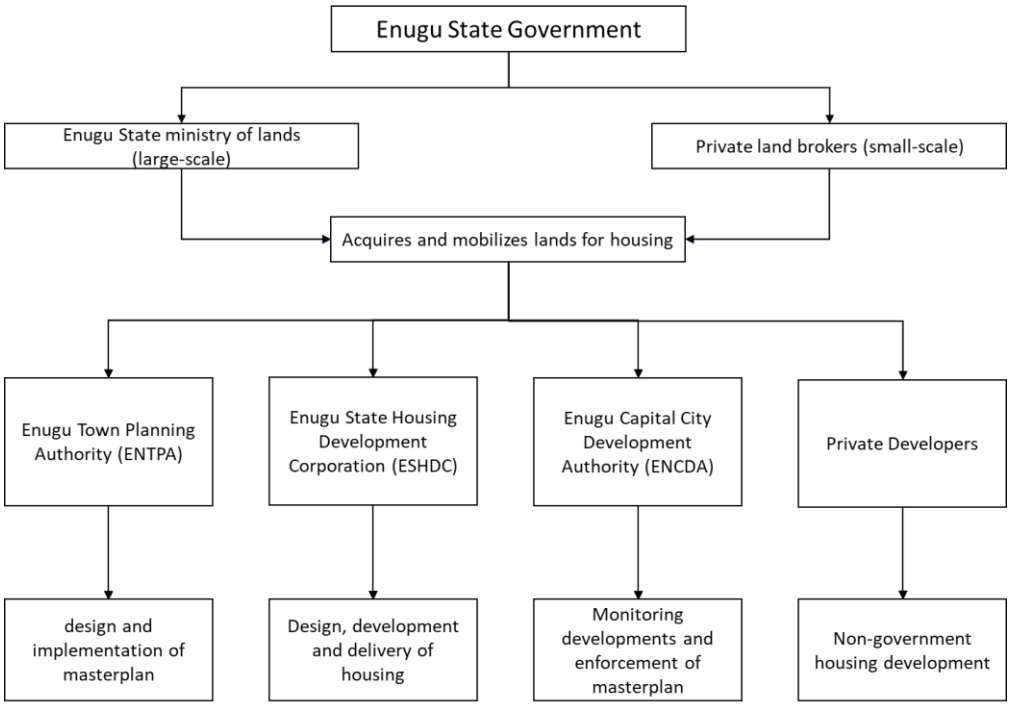

Figure 19: hierarchy of different government housing development stakeholders in Enugu State (Author, 2023)

Despite the participation of (ministry of lands, ENTPA, ESHDC, ECTDA and private developers) in planning, housing development and delivery, Enugu urban still has housing scarcity and unaffordability while some of the existing housing supplies are turning into slums. Therefore, at least one respondent from each of them (ministry of lands, ENTPA, ESHDC, ENCTDA and private developers) was nominated as respondents to the semi-structured

interview used for primary data collection. However, due to COVID-19 lockdown and restrictions during the field data collection period, only the private developers and respondents from ministry of lands accepted a physical interview in full compliance with the COVID-19 safety rules, viz distancing, nose mask, and hand sanitizer. The rest (ENTPA, ESHDC, and ECTDA) preferred virtual meetings. Although they preferred virtual meetings, none of them accepted to grant an interview owing to the political nature their jobs and their concerns for misuse of information which would be gathered from them. However, they (ENTPA, ESHDC, and ECTDA) supported the research by providing other useful materials such as brochures, journals, and existing estate masterplans. Hence, respondents to the interview questions were only one delegate of the ministry of lands and three private developers that are active in the three Local Government Areas of Enugu urban. As a semi-structured interview, respondents were allowed to freely discuss their opinions as they perceived them rather than being compelled to answer in a defined pattern.

While the experts answered the interview questions, the non-experts (households) in the study area answered the survey questions in the questionnaire. Collecting opinions from both the experts and the non-experts (housing occupants) was to be able to draw comparative and complementary views between producers and users of housing.

4.3.2 Population of study area

Population of the study area is not the population of the entire Enugu urban but rather the number of households in the housing estates built by the Enugu state government.

Ideally, population of the study area should be contained in the demographic data of the focus area. Demographic data can be obtained from some strategic government sources such as National Bureau of Statistics (NBS), National Population Commission (NPC) or Independent National Electoral Commission (INEC). Those listed government agencies are the principal custodians of population information in Nigeria as their jobs require them to work with human headcounts in their project execution. However, attempts to contact them during data collection were unsuccessful. They did not respond to emails, phone calls, and text messages. Also, demographic information about the study area were not found on their websites.

Therefore, to ascertain population of the study area, a list of government housing estates (table 5) was compiled using materials gathered from Enugu State Housing Development Corporation (ESHDC). However, accurate number of housing units in each of those estates

was not available but the ESHDC could provide the number of plots (parcels) of land in each of those estates. Inferentially, a plot (parcel) of land represented a housing unit (household) for the purpose of this research. Thus, the total number of plots (parcels) in all the estates represented the total number of households in the study area.

SN	NAME OF ESTATE	LOCATION	NO. OF PLOTS	GEOREFERENCE	YEAR BUILT
Enugu EAST LOCAL GOVERNMENT AREA					
1	VICTORY ESTATE	OLD AIRPORT ROAD	18	LAT: 6.46331 N6º27'47.90999" LONG: 7.5559 E7º33'21.23914"	2015
2	TRINITY ESTATE	OLD AIRPORT ROAD	17	LAT: 6.46362 N6º27'49.02023" LONG: 7.54986 E7º32'59.48117"	2015
3	SUNRISE ESTATE AREA A	EMENE	381		
4	SUNRISE ESTATE **ES**	EMENE	247	LAT: 6.46233 N6º27'44.39934" LONG: 7.57573 E7º34'32.62346"	2003
5	RIVERSIDE HOUSING ESTATE PHASE 1	ABAKPA	721	LAT: 6.47954 N6º28'46.33676'' LONG: 7.52007 E7º31'12.24728"	1967
6	RIVERSIDE HOUSING ESTATE PHASE 2	ABAKPA	317		
7	LAKE SIDE ESTATE	ABAKPA	18	LAT: 6.50052 N6º30'1.87765" LONG: 7.50955 E7º30'34.38997"	2015
8	HARMONY ESTATE PHASE 1	ABAKPA	395	LAT: 6.48551 N6º29'7.836" LONG: 7.54161 E7º32'29.79629"	2001
9	HARMONY ESTATE PHASE 2	ABAKPA	271	LAT: 6.49073 N6º29'26.6402" LONG: 7.54674 E7º32'48.25752"	2001
10	HARMONY ESTATE PHASE 3	ABAKPA	426	LAT: 6.48883 N6º29'19.7741" LONG: 7.55011 E7º33'0.38725"	2001
11	HARMONY ESTATE PHASE 2 EXTENSION	ABAKPA	260		
12	GREENLAND ESTATE 1	RCC	97	LAT: 6.472 N6º28'19.191" LONG: 7.48818 E7º29'17.46557"	2005
13	GREENLAND ESTATE 2	RCC	78	LAT: 6.47133 N6º28'16.79959" LONG: 7.48453 E7º29'4.29839"	2008
14	GREENLAND ESTATE 3	RCC	49	LAT: 6.47223 N6º28'20.0172" LONG: 7.48304 E7º28'58.95872"	2010
15	TRANS EKULU PHASE 1	TRANS EKULU	250	LAT: 6.47725 N6º28'38.11199" LONG: 7.49548 E7º29'43.72264	1980
16	TRANS EKULU PHASE 2	TRANS EKULU	201	LAT: 6.48089 N6º28'51.20598" LONG: 7.48783 E7º29'16.18382	1991
17	TRANS EKULU PHASE 3	TRANS EKULU	355	LAT: 6.48249 N6º28'56.95108" LONG: 7.49553 E7º29'43.90163"	1980
18	TRANS EKULU PHASE 4	TRANS EKULU	238	LAT: 6.47524 N6º28'30.87214 LONG: 7.49077 E7º29'26.78575"	1990
19	TRANS EKULU PHASE 5	TRANS EKULU	210	LAT: 6.4734 N6º28'24.2382" LONG: 7.48379 E7º29'1.631"	1989
20	TRANS EKULU PHASE 6	TRANS EKULU	929	LAT: 6.47637 N6º28'34.93654" LONG: 7.48012 E7º28'48.4324	1989
21	IVORY ESTATE PARCEL A (CBN)	TRANS EKULU	15	LAT: 6.47872 N6º28'43.37915" LONG: 7.49723 E7º29'50.01734"	2009
22	IVORY ESTATE PARCEL B (CBN)	TRANS EKULU	54	LAT: 6.47348 N6º28'24.54524" LONG: 7.49459 E7º29'40.52155"	2008
23	IVORY ESTATE PARCEL C (CBN)	TRANS EKULU	9	LAT: 6.47343 N6º28'24.35437" LONG: 7.49804 E7º29'52.95584"	2009
Enugu NORTH LOCAL GOVERNMENT AREA					
24	COAL CITY GARDEN	GRA	108	LAT: 6.44826 N6º26'53.73294" LONG: 7.48918 E7º29'21.04188"	2008
25	GOLF COURSE ESTATE PHASE 1	GRA	123	LAT: 6.46002 N6º27'36.07837" LONG: 7.48041 E7º28'49.48068"	
26	GOLF COURSE ESTATE PHASE 2	GRA	2168	LAT: 6.46651 N6º27'59.43708"	

				LONG: 7.47711 E7º28’37.60288”	
27	GOLF COURSE ESTATE PHASE 4	GRA	14		
28	GOLF COURSE ESTATE PHASE 5	GRA	22	LAT: 6.46758 N6º28’3.29999” LONG: 7.48314 E7º28’59.29262”	2003
29	GOLF COURSE ESTATE PHASE 1 EXTENSION	GRA	238	LAT: 6.46343 N6º27’48.33274” LONG: 7.48307 E7º28’59.06748”	2008
30	GOLF COURSE ESTATE PHASE 1 COMMERCIAL PLOTS	GRA	18	LAT: 6.46435 N6º27’51.65424” LONG: 7.47287 E7º28’22.32894”	2008
31	EKULU EAST ESTATE (ZOO)	GRA	135	LAT: 6.46626 N6º27’58.53517” LONG: 7.50921 E7º30’33.16954”	2003
32	VALLEY ESTATE PHASE 1 EXTENSION	GRA	16		
33	HERITAGE ESTATE	GRA	9		
34	VALLEY ESTATE PHASE 1	GRA	84	LAT: 6.46534 N6º27’55.24013” LONG: 7.47067 E7º28’14.42312”	2018
35	FIDELITY ESTATE	GRA	63	LAT: 6.45665 N6º27’23.93172” LONG: 7.50073 E7º30’2.61853”	2015
36	FIDELITY ESTATE (TERRACE BUILDING)	GRA	BLOCK A-U		
37	WTC ESTATE	OGUI	162	LAT: 6.4293 N6º25’45.46772” LONG: 7.50333 E7º30’12.0001”	2018
38	CITADEL ESTATE PHASE 2	OGUI	57	LAT: 6.43294 N6º25’58.5759” LONG: 7.50896 E7º30’32.2583”	2018
39	DIVINE ESTATE 9TH MILE	NGWO	81		
40	VALLEY ESTATE PHASE 2	IVA VALLEY	202		
41	CITADEL ESTATE PHASE 1	INDEPENDENCE LAYOUT	68	LAT: 6.42405 N6º25’26.58457” LONG: 7.51465 E7º30’52.74076”	2017
42	CITADEL ESTATE PHASE 1 EXTENSION	INDEPENDENCE LAYOUT	8	LAT: 6.43294 N6º25’58.5759” LONG: 7.50896 E7º30’32.2583”	2018
43	REPUBLIC LAYOUT (BY EHOCOL) PHASE 1	INDEPENDENCE LAYOUT	112	LAT: 6.42557 N6º25’32.04991” LONG: 7.53091 E7º31’51.26657”	1985
44	REPUBLIC LAYOUT (BY EHOCOL) PHASE 2	INDEPENDENCE LAYOUT	47	LAT: 6.42794 N6º25’40.57597” LONG: 7.53198 E7º31’55.11601”	1990
45	REPUBLIC LAYOUT (BY EHOCOL) PHASE 3	INDEPENDENCE LAYOUT	114	LAT: 6.43335 N6º26’0.05615” LONG: 7.53635 E7º32’10.84394”	2009
46	LIBERTY ESTATE PHASE 1	INDEPENDENCE LAYOUT	61	LAT: 6.43705 N6º26’13.3903” LONG: 7.51295 E7º30’46.62911”	2009
47	LIBERTY ESTATE PHASE 2	INDEPENDENCE LAYOUT	32	LAT: 6.43269 N6º25’57.67471” LONG: 7.51519 E7º30’54.69192”	2014
48	INDEPENDENCE POCKET LAYOUT (EBEANO)	INDEPENDENCE LAYOUT	30	LAT: 6.45612 N6º27’22.04572” LONG: 7.51118 E7º30’40.23162”	2003
49	Q SERIES ESTATE	INDEPENDENCE LAYOUT	10	LAT: 6.44883 N6º26’55.77331” LONG: 7.52185 E7º31’18.64726”	2003
Enugu SOUTH LOCAL GOVERNMENT AREA					
50	TRANSPARENCY ESTATE	UWANI	45	LAT: 6.4255 N6º25’31.80612” LONG: 7.48521 E7º29’6.76043”	2014
51	REAL ESTATE (TERRACE BUILDING)	UWANI	BLOCK A-Y	LAT: 6.42032 N6º25’13.15463” LONG: 7.49144 E7º29’29.19361”	1965
52	MARYLAND ESTATE (TERRACE BUILDING)	UWANI	BLOCK A-I	LAT: 6.41713 N6º25’1.67153” LONG 7.51937 E7º31’9.72264”	2003
53	MARYLAND ESTATE (TERRACE BUILDING)	UWANI	BLOCK 10		
54	MARYLAND ESTATE EXTENSION	UWANI	21		
55	SAND VIEW ESTATE	AKWUKE	46		
	TOTAL NUMBER OF PLOTS		10, 195		
RURAL AREAS AND THE FEDERAL CAPITAL TERRITORY (FCT), ABUJA					
56	NETWORK ESTATE	IBAGWA	244		
57	RANGERS ESTATE PHASE 1	AKEGBE	51		
58	RANGERS ESTATE PHASE 2	AKEGBE	116		
59	PALM BEACH ESTATE	NSUKKA (OBUKPA)	121		

60	OLD GRA	NSUKKA	4		
61	WUSE ABUJA ESTATE	ABUJA	09		
HOUSING ESTATES UNDER CONSTRUCTION					
62	HIMALAYA ESTATE	IBAGWA	UNCOMPLETED		
63	ESUT	AGBANI	UNCOMPLETED		
64	UGWUOBA ESTATE	OJI RIVER	UNCOMPLETED		
65	COAL CITY VIEW ESTATE		UNCOMPLETED		
66	TRANS EKULU (OFF PHASE 6)	TRANS EKULU	UNCOMPLETED		

Table 5: list of housing estates under the Enugu State Housing Development Corporation (Author, 2023)

Following from table 5, there are 66 housing estates owned by the Enugu state government – 5 of them are still under construction while another 6 of them are located outside of the Enugu urban territory. Therefore, the remaining operational number of housing estates considered for study were 55 estates.

For the 55 operational housing estates considered for this study, there are 10, 195 households (parcels of land) – this number of parcels was used as the population (or number of households) of the study area. However, 10, 195 households would be too much to handle if survey questionnaires were to be distributed to all of them. Therefore, a sample size of the study area's population was determined and used for the survey. The next section discusses the sample size and how it was determined.

4.3.3 Sample size

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Fridah, 2002). Also, sample size is the number (n) of observations taken from a population through which statistical inferences for the whole population are made (Sims, 2016). In this research context, sample size refers to the number of households selected from the focus population which can be accepted as sufficiently representative of the total households in the study area. Therefore, sample size of the non-expert respondents was determined based 10, 195 households using the following formula (Surveymonkey Inc, 2016):

$$sample\ size = \frac{\frac{z^2\ X\ p(1-p)}{e^2}}{1 + \left(\frac{z^2\ X\ p(1-p)}{e^2 N}\right)}$$

Let N be the total number of households in the focus area.

e = margin of error

p = desired confidence level (expressed as decimals)

z = constant coefficient according to each chosen confidence level

Assigning values to these variables:

N = 10, 195

e = 5%=0.05

p = 95% = 0.95

z = 1.96

Therefore, the sample size was 378 households.

4.3.4 Sampling technique

Having determined the sample size for this study, how to distribute the questionnaires to the respondents was also considered. The ideal practice would be to distribute questionnaires to all the 55 operational housing estates in Enugu urban using the ratios that are proportionate with their respective numbers of households. However, 55 housing estates were too much to handle especially for the limited time frame (1 month) for the field study. Thus, 50 percent of the 55 housing estates were surveyed. 50 percent of 55 estates is arithmetically 27.5 – it was rounded to 27 housing estates (to make it divisible by 3 LGA's).

Clusters of housing estates to focus on in each of the three Local Government Areas (LGA's) of Enugu urban was also considered. Clusters of housing estates were selected using the following criteria:

1. Number of housing estates in the LGA – instead of allocating equal number of housing estates to each LGA, 50 percent of the actual number of housing estates in each LGA was factored out. Therefore:
    a. Enugu north (50%) – 13 estates – 182 questionnaires
    b. Enugu south (50%) – 3 estates – 42 questionnaires
    c. Enugu east (50%) – 11 estates – 154 questionnaires
    d. Total allocations – 378 questionnaires
2. Proximity of selected estates from one another – a complete list of all the estates in the study area was available, field visits were scheduled by grouping sampled estates according to their named locations. Thus, estates located close to one another were grouped together and assigned a single enumerator for convenience of commute during the field data collection.

4.3.5 Instruments of data collection

The instruments used for the data collection were of two mediums:

1. Structured questionnaire for a household survey to collect data from the non-expert respondents.
2. Semi-structured interviews to collect data from the expert respondents.

4.3.6 Method of data collection

There were 4 proposed respondents to the semi-structured interview while there were 371 proposed respondents to the structured questionnaire. Therefore, the semi-structured interview was conducted by one person (because the respondents were few), but three additional research assistants were employed to help in distributing the questionnaires and collecting back the answered questionnaires. This was to ensure that data collection would be completed within the limited time (1 month) allotted for it. Those research assistants were trained for the data collection. Part of the training involved:

1. Familiarizing the research assistants with the structure of the questionnaire.
2. Explaining the objective of the research to the research assistants.
3. Explaining the rationale behind each question contained in the questionnaire to the research assistants so that they could explain same to any respondent who needed clarifications during the data collection.

Furthermore, the research assistants were trained for two categories of respondents – those who could read and write and those who could not read and write. Those who could read and write were allowed to fill out the questionnaires unassisted while those who could not read and write or had difficulty were helped/guided by the research assistants to fill out the questionnaires.

To ensure that the research assistants truly visited the sites allocated to them for survey, they were required to pick the georeference (coordinates) of each estate they visited as a confirmation. By documenting (pinning) the reported georeferences, the idea to extend the georeferencing to other unsurveyed estates was birthed. This was to use the georeferences to create a map of estates owned by the Enugu state government (see fig 19) since none existed prior to the data collection. Mapping of all the estates in Enugu is a part this research's contribution to the society apart from the contribution which the research main objectives would yield.

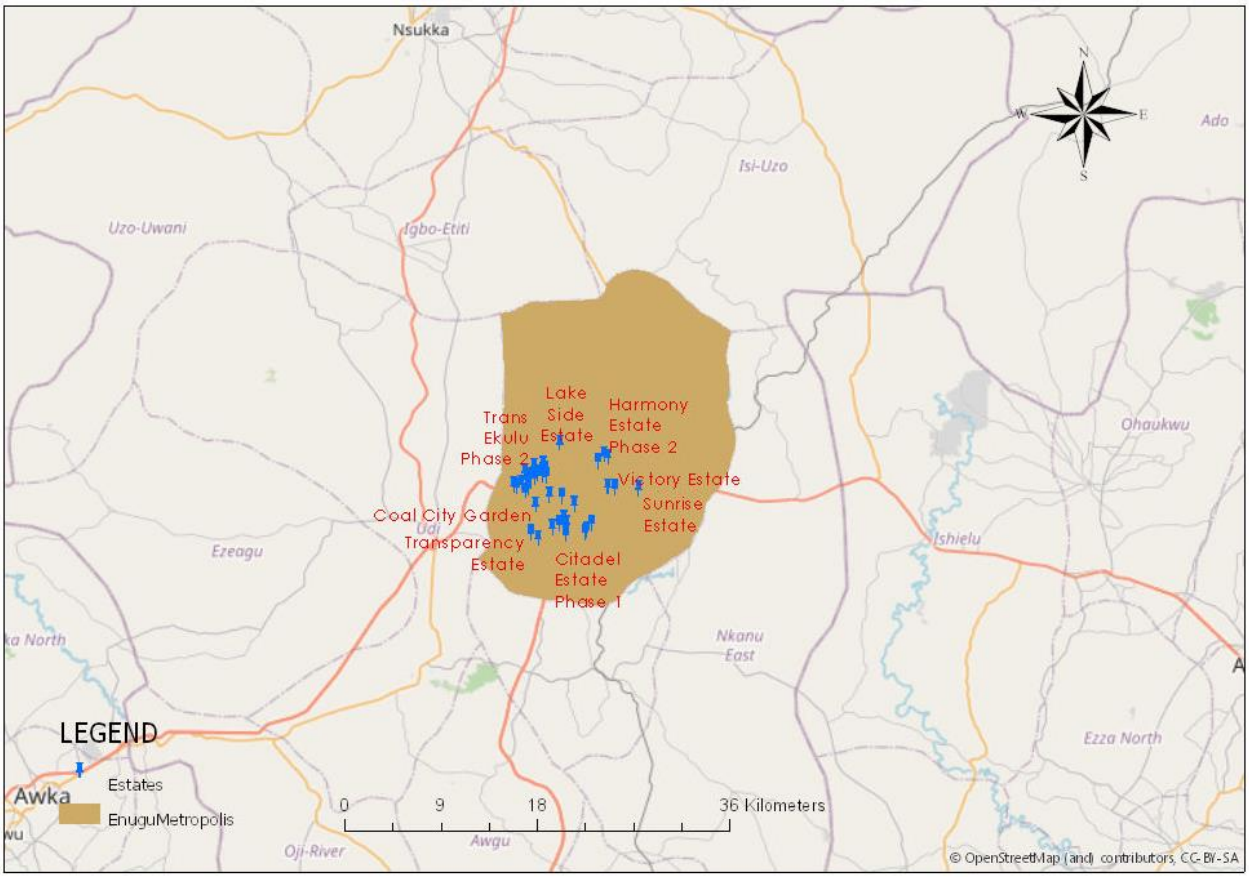

Figure 20: GIS map of Enugu Metropolis showing government housing estates (Author, 2023)

Although the use of digital questionnaire (google sheet or other online platforms) is becoming a trend, paper-printed questionnaires were used for the following reasons:

1. There was an expectation that most occupants in the study area would be elderly respondents, and they were not likely to be conversant with the use of digital gadgets.
2. The fonts on the printed questionnaire were better for the eyes especially for elderly respondents who might struggle reading from the screens of a mobile device or computer.
3. A printed paper has no risk of battery failure or internet network fluctuations as could be experienced in digital devices used in collecting data from digital questionnaire.
4. There was the expectation that most people in the study area (likely) do not use their emails regularly owing to the costs of internet and preponderance of chat platforms over emails in the study area.

4.3.7 Testing internal validity of data collection instruments (pre-survey test)

To ensure that the questionnaires being sent to the field covered all the necessary aspects of information needed for the research, a trial survey was conducted. The trial survey was conducted to receive feedback and critiquing of the questionnaire only. This trial survey was done with a group of randomly selected respondents across experts and non-experts in the planning and development sectors. The trial respondents involved twenty people:

- 1 architect
- 1 real estate surveyor
- 1 civil engineer
- 2 facility managers
- 15 other non-expert respondents living in low-income housing estates in Enugu.

After collecting feedback from the trial survey with experts and non-experts, a final trial was done with critiques from the academia to help form the questionnaire into a scientifically acceptable tool for data collection. Hence, the feedback providers from the academia ranged from, doctoral students, master's students, post-doctoral researchers, and career academic researchers.

Above all, samples of questionnaires from existing research were perused and used as guides to developing the final draft questionnaire for this research. Therefore, the questionnaires used for this data collection underwent a total of six reviews and feedback processes before a final piece was adopted for the field survey.

4.4 Criteria for data collection

The choice of Enugu urban was because all the affordable housing schemes in Enugu state are concentrated in the Enugu urban. Other criteria were adopted in collecting data for this study.

4.4.1 Criterion 1: testing plausibility and validity of responses from multiple perspectives of respondents

The "respondents" in this research refers to the groups of people who were contacted to provide answers to the questions in the interviews and the questionnaires. The two groups of people considered for response to the research questionnaires and interviews were:

1. The expert respondents and

2. The non-expert respondents.

The expert respondents broadly include professionals in the housing industry. In the context of this research, managers of housing development companies, architects, engineers, or planners were eligible expert respondents. This is because they play major design roles in the early stages of housing development projects. For the expert respondents, interviews were conducted but observations were made whenever necessary as supportive resource in improving the quality of the data collected. Conducting interviews with the experts was necessary because of the non-obvious nature of the problem (causes of slum) being investigated. Information of this nature requires interactions with respondents who can answer questions based on knowledge and experience in projects related to the research problem.

The non-expert respondents, on the other hand, were limited to the occupants of houses in the study area. The non-experts answered semi-structured interview questions to provide deep insights into slum problems in housing units they occupy. Survey questions were developed using the five attributes of slum as a guide (see chapter 2). These attributes of slum were later used to measure the extent of dilapidation of existing housings in the case study area. As the attributes, a place is a slum when they lack one or more of the following (Un-Habitat, 2006):

1. Durable housing of a permanent nature that protects against extreme climate conditions.
2. Sufficient living space which means not more than three people sharing the same room.
3. Easy access to safe water in sufficient amounts at an affordable price.
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
5. Security of tenure that prevents forced evictions.

Houses in the study area refer to the "housing estates that were developed under one of the government's affordable housing schemes". This is because there have not been much research and publications on the states of disrepair and dilapidation on government-owned housing estates in Enugu. However, there are some attempts at research into the private estates in Enugu. For instance, Umeora (2020) conducted a research into the levels of disrepair on non-governmental housing estates in Enugu. That research revealed (in general) that the areas under study required just minor repairs and were mostly good for human habitation. This suggests that there is no urgent need to attend to the private housing estates in Enugu. Therefore, this research focused solely on the affordable housing estates owned by the government (see table 5).

4.4.2 Criterion 2: the rationales behind each survey question

The survey questionnaire contained five sections aligning with the five attributes of slum. Each of the five attributes formed a dependent variable under which other sets of related questions were asked to determine how the study area aligns or deviates from such attribute. Tables 6 – 10 present questions under each slum attribute. Below each table are explanations on the reason for choosing those questions.

4.4.2.1 Tenure security/housing affordability

Tenure security/housing affordability
1. do you own or rent your apartment?
2. If you own your apartment, how did you acquire it?
3. if you are a tenant, how much rent do you pay in 1 year?
4. if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year?
5. at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase?

Table 6: rationale for selecting survey question under tenure security (Author, 2023)

In discussing housing tenure security, what comes to the mind is the extent to which an occupant can remain in a property without fear of displacement (Payne & Durand-lasserve, 2012). This sense of stability in occupancy can be held either as a house owner or as a tenant. Owning or renting depends on what an occupant can afford. Furthermore, for a house owner, tenure security is infinite unless it is altered by exceptional situations such as escape from insecurity or government eviction order based on power of eminent domain. For a tenant, the tenure depends on how long the lessor can rent the property. Also, not having the money to pay for rents can compromise or shorten the tenure security of a tenant. Therefore, questions under this item covered both housing ownership, cost of renting an accommodation, and the respondent's ability to afford the rent. Further questions were asked to determine how affordable the housings are to either those who rent or those who own. For those who own their dwelling, the questionnaire aimed to elicit how they acquired it. This was to know which strategies help homeowners most to acquire their properties. On the other hand, for those who rent their dwellings, the questionnaire focused on how much they pay for their rents, how much they can afford if they were to rent a specific size of dwelling (3-bedroom bungalow). 3-bedroom bungalow was used as a standard here because it has been the most widely used configuration for design of a single-family (family of 5) housing unit in Nigeria. Also, 1 year rent value was applied because rents are paid per annum in Nigeria rather than monthly, weekly, or daily.

4.4.2.2 Sufficient living space

Sufficient living space
1. how many bedrooms are there in your house/apartment?
2. how many people live in your house/apartment?
3. Within your estate, do you have some recreational centres/playgrounds?
4. Do you have some green areas (with trees/flowers) for relaxation within your estate?

Table 7: rationale for selecting questions under sufficient living space (Author, 2023)

In the context of housing estates, sufficient living space includes both the interior and the exterior spaces. The interior space in this research context refers to the single housing unit occupied by a household while the exterior space refers to the surroundings of the housing including the ancillary facilities. In either case (whether interior or exterior), the space is discussed in terms of human-space relationship to know how adequate the space is to the users.

Thus, for the interior space (single housing unit), data were collected on the number of bedrooms contained in a household. The emphasis on "bedrooms" here is that residential housings in Nigeria are judged by the number of bedrooms not by the absolute number of rooms in the house. Also, the square meter (area) of the space is not as important as the number of bedrooms for Nigerian tenants. Furthermore, data were collected on the number of people living in the single housing unit to know if the space is enough for them or not. On the other hand, for the exterior space, data were collected on the availability of open utility spaces. They include green cover and recreational spaces.

The category used here was according to UN-Habitat (2006) attributes of slum. One of the attributes suggests that a place is a slum if more than 3 people live in one room. Thus, the family sizes were checked in three categories: (i) one category was 1-3 persons in a room; (ii) another category was 4-6 persons; (iii) the other was above 6 persons. Number ranges were used instead of specific numbers because people are unlikely to tell you the exact family size in a household enumeration because of their distrust on the stated purpose of the data collection. From the cultural dimension, the Igbos quantify humans using indefinite quantities (such as "many", "several" or "innumerable") rather than in specific headcounts. Sequel to this culture, people find it uncomfortable to mention their exact family size.

4.4.2.3 Access to adequate sanitation

Access to adequate sanitation
1. do you clean your sewage by yourself?
2. if no, in your opinion, who should take care of your sewage?
3. does your neighbourhood have functional drainage channels (gutter)?
4. if no, why?

Table 8: rationale for selecting questions under access to adequate sanitation (Author, 2023)

Under this attribute, questions about access to adequate sanitation covered issues on cleaning of sewage channels; who cleans the sewage; and whose responsibility it is to clean the sewage ideally. As decently build estates, they have in them modern toilets and other basic sanitary utilities. Thus, the questions were not focusing on whether a household has a toilet. Furthermore, most people are unlikely to discuss issues concerning their toilets with a stranger. Culturally, anything pertaining to feces and human excretes is treated with repugnance and can be referred to as vulgar. Therefore, anything associated with feces is found indecent. A good example is that in Igbo culture, the left hand is dedicated to cleaning after defecation while the right hand is dedicated to eating food. Thus, giving items to an Igbo person using the left hand is found disrespectful because of its association with feces and other negatives. Hence, instead of probing into the conditions of their toilets and bathrooms which most people would not be willing to discuss, questions about sanitation were limited to conditions of sewage and drainage systems in the estates which many people can freely discuss.

4.4.2.4 Easy/sufficient access to services

Easy/sufficient access to services
1. is your house/apartment connected to the central water supply?
2. if no, where do you get your water?
3. How far away is your house/apartment from hospitals/health centres/clinics?
4. How far is your house/apartment from a nursery/primary school?
5. How far is your house/apartment from markets and shopping centres?
6. How do you access internet services?
7. What is the condition of access roads to your estate?
8. is there consistent/routine repair of roads in your estate?

Table 9: rationale for selecting questions under easy/sufficient access to services (Author, 2023)

Easy and sufficient access to services investigated the presence or absence facilities that help a dwelling to function both externally and internally. Internal services include water,

electricity, telecommunication, and other utilities attached to a housing unit which the occupants can use exclusively from other occupants. External services include hospitals/clinics, schools, churches, shopping centers, access roads and other facilities which are outside of the housing unit and are jointly used by other occupants which help individual housing units to be livable.

For internal services, questions focused on access to water supply only but did not address electricity or telecommunication. While all are important, water is the most important of them and is indispensable for human existence. On the other hand, electricity is a national issue of which its supply nationally is problematic. Thus, the challenge an estate faces on electricity might be the same as the challenge other neighborhoods face.

4.4.2.5 Durable housing of permanent nature

Durable housing of permanent nature
1. are there serious breakdowns/damages to your house/apartment?
2. If there is a damage or breakdown in your apartment, how long do you have to wait for the repairs to be done?
3. whose responsibility is it to repair breakdowns in your house?

Table 10: rationale for selecting questions under durable housing of permanent nature (Author, 2023)

Absence of housing built with long-lasting materials may qualify a place as a slum. Hence data were collected on goodness or damages on the housing units within the estates which were surveyed. A test of durability of a material is to check its extent and nature of breakdown over period of use. Therefore, data on the damages to the housing units were collected. Further data were collected on the repairs and whose responsibility it is to repair damages in a house.

There are different categories of damages to the housing units. While a list of some damages was given, there was a provision for the respondents to indicate “others” that were not covered in the list. The “others” gives the respondents a chance to include some of those things they might not be comfortable naming.

4.4.2.6 Important but not included in the questionnaire.

Because of their sensitivities, the following question were excluded the survey questionnaire: incomes of respondents, conditions of toilets, additional rooms to an existing building, erection of shops withing residential areas, living on unauthorized parcels in the estate, living with friends and relatives, marital status if separated/divorced, age, gender, exact family size, and conditions of kitchens in the house.

1. Why exclude those sensitive questions?
    a. Respondents would be uncomfortable to answer those sensitive questions (to a stranger).
    b. Presence of those sensitive questions in a survey could also raise suspicions in the respondents and might further discourage them from answering subsequent questions in the survey because the trust would have been lost.
2. How were the sensitivities determined?
    a. Before designing the final questionnaire, a test questionnaire was sent to the field; and those sensitive questions were not answered.
    b. Also, a discussion with 19 locals was held about those question and they confirmed that such questions would receive less or no responses.
3. How were the sensitive questions addressed?
    a. through observations
    b. taking photos
    c. making written notes.

4.4.3 Criterion 3: testing plausibility and validity through multiple data collection methods distributing the questionnaires and field data.

Arising from the pre-survey test, two types of questionnaires were designed:

1. Structured (close-ended) questionnaire
2. Semi-structured (open-ended) questionnaire

Structured questionnaires were used to keep the non-experts guided on the ways to answer the questions. This is because they were not specialists in the subject of study and were likely to provide a wide range of answers which might not be applicable to the research focus.

On the other hand, semi-structured questionnaires were used for the expert respondents to obtain wider arrays of answers on the research issue. This open-ended approach allowed the expert respondents to provide as much answers as they could which would provide extended insight into some answers already provided by the non-experts. The import of allowing the experts to address open-ended questions is that they would have had numerous experiences in housing development and the commerce of spatial planning. Therefore, it was necessary to

allow them to share those experiences in detail to guide this research in making plausible recommendations through knowledge of reliable data.

4.5 Data storage, analysis, triangulation, and presentation

The information collected needed to be stored, interpreted, and presented in a form that is understandable to a wider audience and readers. There are innumerable mediums of data storage, analysis, and presentation.

4.5.1 Data storage

While the data collected using the structured questionnaires could be directly captured and stored using the same questionnaire paper, there was the need for an additional data capturing instrument for the semi-structured questionnaire. This is because the semi-structured questionnaire required open-ended answers which could either be in simple-single-words or in elaborate sentences. However, most interview responses are orally provided (spoken) and require some capturing tools and systems. Spoken responses can be written down, recorded electronically (in audio/video form), or memorized by the listener. In each data capturing option adopted, there is always the need to return the captured information to the responder for validation. Validation is done to ensure that the responder agrees with what the interviewer captured. Therefore, fig 21 captures the six basic steps toed towards storage of primary data extracted from the unstructured interview of this study.

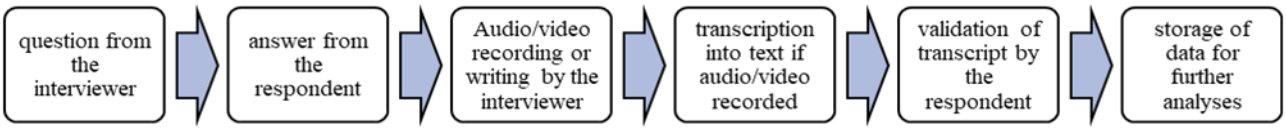

Figure 21: the process of collecting interview data, storage, and analysis (Author, 2023)

Among these three options of data capturing mentioned here, memorizing by the listener appeared to be the weakest option. This is because the listener can forget much of the information memorized after some time, reducing the quality of data reported. In memorization, one way to seek validation from the responder is to orally ask them (for instance) “did you say x, y, z…….?”. Therefore, even when those validations are made, it is still possible that some of the information remembered may not adequately represent the idea of the responder when they are finally written out. Thus, memorizing was eliminated.

For electronic (audio/video) recording, a device is used to capture the voice (or and) image of the respondent which can be replayed to portray the exact words of the respondent. However, two challenges therein are: (i) possibility of poor sound quality during replay and (ii) poor listening skills of the transcriber who would transcribe the audio into texts.

Assume that the audio quality is good but human transcriber is not available, there exist some audio/video-to-text (transcription) software such as envivo, Happy Scribe, Rev, Amberscript, Nuance, Transcribe, Trint, Transcribe, Express Scribe (Rehan, 2021). However, the challenges with the transcription software include mismatch of the speakers' accents with the dictions recognizable by the software itself. Another challenge is compatibility/interoperability issues with data files across different devices. Therefore, there is always the need to ensure that the file format of final transcript of the voice-to-text output is compatible with the medium in which it is intended to be used. Furthermore, some voice-to-text software are not free access and require license fees. For some of them which are free access, they provide the users access to limited functions.

Beyond the technical problems mentioned above, seeking validation of the captured data from the respondent requires that the transcript of the recorded audio/video is sent back to the respondent to peruse and confirm, reject, or correct (parts of) the transcript. This requires some time expenditure by both the transcriber and the respondent who reads through the transcript before validation.

Additionally, all 4 respondents did not accept to be recorded. They expressed their concerns about their recorded audios/videos being misappropriated in the future. This is especially because the nature of their occupation (real estate and occasional consultancy with the government) required them to apply caution while granting recorded interviews.

Above all, most of the transcription software require internet connection to perform their functions. Meanwhile, cost of internet data in the study area was high, requiring me to seek some other interview data capturing system.

Having rejected the two options of memorizing and audio/video recording, the only feasible option was writing down the respondents' answers during the interviews. The option of Writing down the respondents' answers accorded the respondents the comfort to express themselves better and freely without any fear of their audio/video being misappropriated in the future. As opposed to writing with pen/pencil and paper, answers were written using a laptop computer

(while keeping a digital tablet as backup in case of battery outage on the laptop). Writing with laptop or tablet offered the flexibility to edit already written texts whenever the respondent requested some corrections.

Validation of answers from the respondents was done in-situ. Immediately after responding to each question, recorded responses were read out to the respondent to confirm if what was written represented their thoughts. Using this approach, encounter with the respondent was just once and saves everyone the time which could have been wasted during transcription and sending back to the respondent for validation. This approach was adopted because of the difficulty encountered in contacting and making appointments with those respondents. This was because they appeared busy and might likely not be available to follow up on the conversation in further appointments and meetings. Figure 22 summarizes the selection criteria adopted in capturing and storing data for this study.

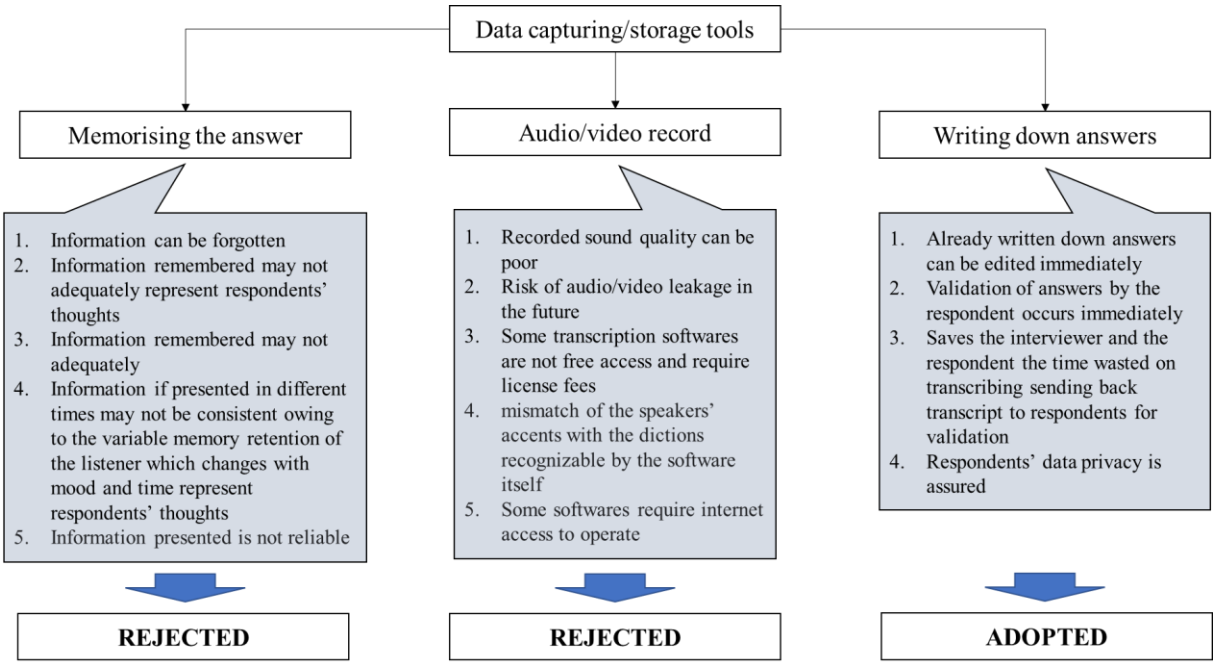

Figure 22: comparison of different data storage tools and criteria for choosing a tool (Author, 2023)

4.5.2 Data analysis

Responses from both the structured and semi-structured questionnaires required further breaking down into simpler forms to make their meanings clearer. Answers to the semi-structured interview were grouped according to the similarities which each answer shares with another. These groupings helped made interpretations/discussions easier. On the other hand,

Microsoft excel, and IBM SPSS were uses to analyze data collected from survey (structured questionnaire). Extensive use of tabulations and charts were employed to organize the results. Classifications of results (semi-structured) and tables/charts (structured) was just one step towards breaking down the data for better understanding. However, the meanings of those results were not complete without adding further explanations.

Therefore, further interpretation of the data was made to explain what each classification, characteristic or outcome meant. This was especially because there was the need to relate each result with the context under which the study was conducted to avoid misinterpretation of results.

4.5.3 Data Triangulation

Triangulation is a method used to increase the credibility and validity of research findings (Noble & Heale, 2019). Triangulation is classified into four (Noble & Heale, 2019; Norman, 2009; UN Aids, 2010). Those four types of triangulations are as follows: (1) data triangulation: the use of multiple data sources in a single study; (2) investigator triangulation: the use of multiple investigators/researchers to study a particular phenomenon; (3) theory triangulation: the use of multiple perspectives to interpret the results of a study; and (4) methodological triangulation: the use of multiple methods such as interviews and observations to conduct a study. Triangulation closely resembles a literature review, but the difference is that literature review is limited to comparing already published data while triangulation extends to originally collected data by the researcher. Using triangulation, a researcher can use the strengths of one method to compensate for the shortcomings of another (Shortcutstv, 2015). Such shortcomings can affect the plausibility and reliability of a result. Therefore, to increase the plausibility of this research, triangulation was used to eliminate possible biases that might enshroud the results.

Among the four types of triangulations described, methodological triangulation was used. This was because answers to the primary data questions were solely based on peoples' standpoints. Two standpoints in this research context were either as an expert involved in development and delivery of housing or as an occupant of one of the housings. Therefore, methodological triangulation sufficed because of its characteristic of assessing data using multiple methods. Hence, the choice of collecting both expert and non-expert data.

4.5.4 Data presentation

Although the responses gathered had been broken down into simpler forms, some of them would be better understood when presented in less complex forms. Hence, visual tools were used where applicable to represent the data already processed. Most of the results were presented in tables, some others as graphs, bar charts and histograms. Also, legends or additional descriptive texts were added wherever necessary to make those visuals more understandable.

4.6 Conclusion

This research followed a qualitative approach to data collection. It relied mostly on primary data collected through interviews with expert respondents and questionnaires distributed among selected non-expert respondents. This chapter explained the steps followed in the data collection. This chapter also explained various considerations made in adopting the approaches used for the data collection. Hence, this chapter acknowledges that there exist other methods which can be used in collecting, analyzing, and presenting the data but the adopted methods were chosen because they fitted best into the context of the research despite the limitations faced during the research.

Chapter 5: Data and findings

5.1 Introduction

Whilst chapter 4 addressed the data collection and analysis methodology, this chapter (5) presents the collected data and further interprets them.

Following the logic of case study research, the data collection focused on understanding the causes and the extent (effects) of slum emergence in the case of an existing affordable housing scheme delivered by the state government in Enugu, Nigeria.

Respondents in the data collection were experts (4 respondents) and non-experts (375 respondents). The expert respondents answered questions concerning (1) the models for affordable housing in Enugu and (2) the management of housing estates in Enugu. Expert data were collected using semi-structured interviews only. On the other hand, the non-expert respondents answered questions concerning (3) the conditions of houses in which they live (within the government housing estates in Enugu urban). Non-expert data were collected using structured surveys only.

For the expert respondents, one respondent from Enugu State Ministry of Lands was interviewed. The Enugu state ministry of lands participates in housing development apart from land acquisition and mobilization. Answers provided by the respondent from the Enugu state ministry of lands represent opinion of the government developers. To corroborate the answers provided by the government developers, and to check whether the initial insights were consistent across different types of organizational contexts, 3 additional expert respondents from three different non-government housing developers were interviewed. Those private developers were selected on the condition that each of them was active in the three Local Government Areas (LGA's) of Enugu urban (the focus area). The expert respondents (government and private) presented their respective views, wishes, and needs in relation to developing and delivering housing to the low-income populace of Enugu. They further indicated what they perceived as best approaches to control or prevent slums from occurring in their housing projects.

Each expert interview followed the same protocol. Before commencing interview with each respondent, they were asked to indicate if they wished to remain anonymous or allow their individual/companies' identities to be disclosed alongside their responses. All the expert

respondents preferred to remain anonymous. Therefore, each respondent was represented by an alias. Thus, they were named as respondents A, B, C and D as will be seen in the next sections.

5.2 Experts' views on affordable housing and social housing in Enugu

As a semi-structured interview, respondents were asked the same set of questions, but were allowed to answer those questions flexibly without being confined to a list of answers. While the design of the semi-structured interviews was kept broad, the aim of the interview was to derive a qualitative insight into whether there would be any relationship between the independent and the dependent variables.

1. Independent variables – investigated the presence of active policies on affordable housing through the following questions:
    a. Does your company build low-income houses? (To know if a company produces or does not produce low-income housing)
    b. Does your company produce social housing? (To know if a accompany offers houses to no-income people)
    c. How long has your company been practicing? (To understand historical and contingent factors contributing to motivation for low-income housing)
2. Dependent variables – investigated the manifestations of slum emergence through the following questions:
    a. Are there some of your existing housing developments that turned into slums? (To address durability factors)
    b. Does your company have records of uncompleted/abandoned housing developments? (To discuss the role of strategic and operational planning)
    c. Does your company have records of not achieving the target number of housing units? (To investigate the degree of uncompleted/abandoned housing projects)
    d. Respondents were further given a chance to talk about any aspects they felt that were not covered in the discussion.

Summarizing the answers to the six main interview questions, out of the 4 respondents:

a. 3 companies build low-income housing while 1 company does not build low-income housing.
b. All 4 companies have practiced for 11 years and above.

c. All 4 companies have no records of housing developments which turned into slums.
d. All 4 companies have no records of uncompleted housing developments.
e. All 4 companies have no records of not achieving their target number of housing units.

The interview protocol continued with open-ended questions which allowed broader discussions. In the broader discussions, each expert respondent expanded further on reasons behind each answer they have provided for each main question they answered. It further provided the opportunity to relate those answers to the topic of interest. The latter was considered necessary to elicit the context and strategies for their behavior and intentions in the long run.

During the open discussion, the main points of their responses were recorded with the aim to classify their answers afterwards and relate them to other contextual factors which could be of influence on slum formation. First, answers from the respondents were written as quotes from them. Then, a recap of their responses was read out to them immediately to confirm if the recorded answers of them were correct. Through this, it was ensured that the data collected and presented were the true representations of the respondents' answers. This was as opposed to sending the respondents records of their responses later on a different date which might prolong their response time and delay the research progress. Concern for response time was important because getting appointments with the expert respondents was difficult. Answers from the expert were further simplified by interpreting them in simpler words. The next sections present the answers by the expert respondents and the accompanying summaries of those responses.

5.2.1 Building/not building low-income housing.

This question required both those that build and those that do not build low-income housing to provide their reasons/motivations for building/not building low-income housing. Additional to the reason/motivation, those that build low-income housing:

i. Described their respective approaches for determining a low-income housing.
ii. Described their strategies for delivering the low-income housing to the people.

Respondent D does not produce low-income housing – the rest do. For those that build low-income housing, their motivations for building low-income housing varied among the respondents. Their reasons are as presented below.

According to respondent A: "*our company wants everybody to own a home no-matter their incomes. If you look, you will see that many people in Enugu are low-income earners, and we must build what they can afford. Meanwhile, our company does not make high profits from low-income housing, but it helps us to stay relevant and popular in the competitive real estate business. The more properties we build and sell, the more likely people know about us. People will also trust us to handle bigger projects because they see what we can do. From those bigger projects, we can then make better profits. Also, we create jobs when we develop low-income housings in Enugu*". The key issues here are the reference to profits and the purchasing powers of the larger population. For respondent A, low-income housings give them low profits, but they produce them to contribute to making decent housings accessible to all income groups (especially the low-/middle-income people). However, they derive other non-monetary benefits which include publicity, credibility, and opportunities for new projects.

Although respondent B also builds low-income housing, their motivation slightly differed from that of respondent A. Quoting respondent B: "*low-income housing is the only realistic kind of housing for the larger Enugu population. Enugu is predominantly occupied by civil servants whose incomes are between low and middle. This means that high-income housing is not viable in Enugu. Therefore, we focus mostly on low-income housing.* The key issue here is a balance of interests. The ideal interest of this developer would have been to make the highest possible profit in each sale. However, the ruling market interest is that of the predominant population. The predominant population are the low-income people of Enugu. Hence, the developer adjusts the costs of their housing to meet the purchasing power of the predominant population. Therefore, this developer simply complied with the market realities to be able to remain in business – otherwise, they may not be able to sell much of their houses if they built only for the high-income groups.

Respondent C builds low-income housing and explained their motivation as follows: "*We are a partnership company of three people. The three of us were raised in the same neighborhood in Enugu. We were from poor families and grew up in a neighborhood with poor housing conditions – in short, it was a slum, but I will not mention the name here. Growing up, we were exposed to many dangers, diseases, insecurity, and bad gangs. Because of these difficult life experiences, we decided to venture into building decent housing which poor families in Enugu can afford. We also create jobs through the construction of low-income housing*". Therefore, additional to their recourse to purchasing powers, respondent C invests in low-income housing

based on passion. This passion is applied towards achieving environmental cleanliness, job creation, and social sanity only. There is less emphasis on profits while the ploy to make positive social impacts on the vulnerable population predominates.

Respondent D said that their company does not produce low-income housing currently. Quoting respondent D: *"we used to build low-income housings but stopped since over 30 years ago because it was not profitable to us".* The key issue here is about profit. The low profit margin which other developers accepted to produce low-income housing is not acceptable to this developer. Respondent D affirmed that if there can be a high profit from the sales of low-income housing, they would venture into its production again. Therefore, the reason for not producing low-income housing is low profit.

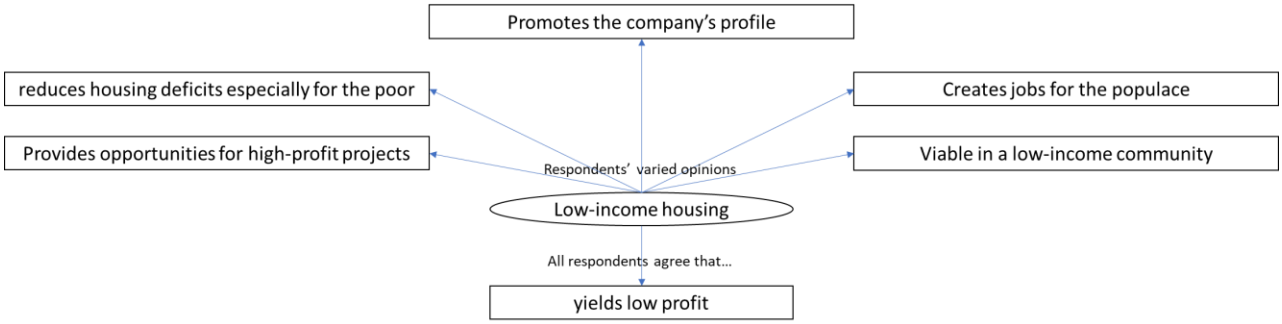

Figure 23: motivations/reasons to build/not build low-income housing in Enugu (Author, 2023)

Inferring from the various explanations of the respective respondents: in one aspect, both those who build low-income housing and those who do not build low-income housing mutually agree that low-income housing does not yield high profits. However, those who produce low-income housing do so because of the following (see also fig 23):

i. To make positive social impact by making decent housing accessible to the poor
ii. The predominant population of Enugu (Nigeria) is low-income and can best afford low-income housing.
iii. Using low profits to sustain a company while seeking opportunities for high profit projects.
iv. To create jobs for the people by employing them in labours of low-income housing development.

v. To promote the company's profile while positioning for the opportunities for high profit projects.

Each respondent was further asked if they also build social housing schemes. All the respondents answered "NO", which means that they do not produce social (rent-free) housing. Respondents A, B and D did not explain further their reasons for not producing social housings. However, respondent C explained why they do not produce social housing.

Quoting respondent C: *"not at all because social housing is a charity project. Only the government or foundations and NGOs can do that". We can only gift houses to some of our high-performing staff members, or gift houses to some needy people in the community. However, this is not the core of our practice because we cannot sustain it".* Since it was only one respondent that explained their reasons for not developing social housing schemes, the inferred reasoning around non-development of social housing by Enugu developers was solely based on respondent C. Thus, the key issue here is profit returned on investment. A social housing might require the same amount of resources as some other (for profit) housing scheme but does not yield profit to the developers. This is because it is offered to the beneficiaries either for free or at subsidized prices. Hence, a producer would not engage in social housing schemes if they cannot recoup profits.

Therefore, if a developer avoids the production of low-income housing, it is because of "low profit". But if a developer avoids the production of social housing, it is because of "no profit".

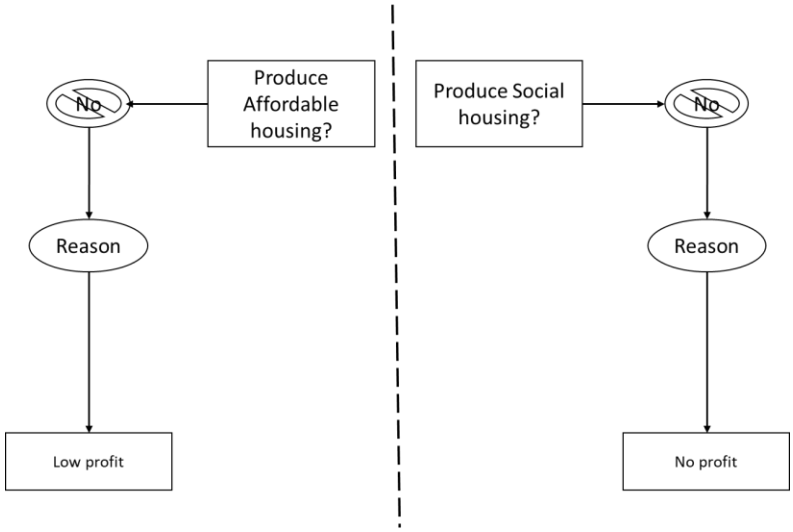

Figure 24: Reasons to/not to produce low-income housing (and social housing) in Enugu (Author, 2023)

Just as the respondents differed in their reasons for building or not building low-income housing, they also differed in their respective criteria for determining low-income. The discussions therefore evolved differently for each respondent depending on how they qualify a house as low-income housing. The purpose of this discussion was to find out the criteria used by the respective respondents in determining or qualifying a dwelling as a low-income housing. Some of the most prominent remarks are highlighted below in quotes.

Respondent A: *"our company designs different housing prototypes. Among those prototypes, there are those designed to suit the finances of the low-income groups".* Apart from this explanation, respondent A declined explaining further details about the features and characteristics of the low-income housing prototype. One could interpret this as an internal strategic motivation, which is apparently not shared publicly, even during an anonymous interview. However, what is evident from this respondent's answer is that they produce a mix of low-income and high-income housings.

Respondent B: *"we make low-income housing by keeping our designs simple. There are minimum sizes of rooms required by the building bye laws – we do not reduce those sizes. However, our architects try to avoid design features whose functions are only decorative but will not affect functionality of the house if such features are removed. For example, some pillars you see in front of many houses are just for aesthetics and those pillars are expensive. We can remove those pillars from our designs to cut costs. Also, in our specifications, we avoid luxury materials, and replace them with durable quality materials of lower costs. An example is that we use ceramic tiles sometimes instead of marbles. This is how we reduce cost without compromising on the quality of the houses we build".* The key message here is that this developer associates housing affordability with the cost of construction and cost of building materials. Thus, they control cost by ensuring that their housing designs are simple. This simplicity of designs further makes the construction simpler and reduces the quantity and cost of materials used. One could comment on such an approach by saying that this fosters the construction of cheap and rapidly built houses with possibly non-durable or unsustainable materials. However, a counter argument could be that this fosters cost-effective housing designs and durable construction methods.

Respondent C: *"No matter how low you keep the price, not everyone can buy a house. Even though we consider low-income, we also acknowledge that what is affordable to one person may not be affordable to the other person even when they earn the same income. Some people*

have other different individual needs that cost them money which further prevent them from affording a house. We just build houses whose prices are moderate based on market values. Whoever that can afford the house buys from us". The key point in this quote is that the purchasing power of individuals, and not necessarily the cost of construction determines the degree of affordability. Affordability in this view has more to do with overall levels of economic equality rather than a responsibility for the developer.

Respondent D said that their company does not produce low-income housing. Therefore, they have no method or design for determining low-income housing. Quoting respondent D: *"what we do is that we acquire land parcels, design an estate layout, and advertise plots of land for sale. We also build some of the houses by ourselves and sell them to the people. Before we build, we first make adverts of the proposed housing development. People then apply to buy those houses when completed – we call it declaration of interest. After, the declaration of interest, we contact the applicants to fill in their biodata for documentation and to pay the required initial down-payment as commitment. Based on the number of people who declared interest and paid the required commitment fee, we will build same number of houses for them. I will just say that the number of houses we build depends on the number of people who indicated interests in owning properties in our estate. However, if there are more people seeking to buy our properties than we can deliver, we raise the eligibility requirements higher to control the number of applicants".* What is significant in this quote is that the respondent completely ignores the purchasing power or housing needs expressed by potential housing residents but assumes that they can build and create a market given a certain competition and scarcity for houses. Indirectly, one could argue that affordability is not a key concern for this developer. This may be due to a market pressure to build and sell, rather than to provide housing for a particular group in the society.

From different answers given by the respondents, respondents A and B seem to align in their approaches. While respondent A talked about making simple architectural designs and using good quality non-luxury materials, respondent B talked about designing different categories of housing to allow both low-income and high-income groups choose whichever they can afford.

On the other hand, respondents C and D seem to align in their approaches: respondent C implied that they make efforts to keep their housings at moderate prices so that both low-income and high-income people can afford them. Respondent D simply produces houses and offers them to anyone who can afford them. This means that, respondent C and D do not target

low-income earners expressly but rather produce houses based on the profit margin they expect to recoup.

Inferring from the responses of the four respondents (A, B, C, and D), approaches for housing delivery in Enugu can be summarized as follows:

i. Make simple architectural designs that are less expensive to construct, sell and maintain.
ii. Avoid luxury materials but use good quality materials to achieve durability.
iii. Design different categories of housing for low-income and high-income.

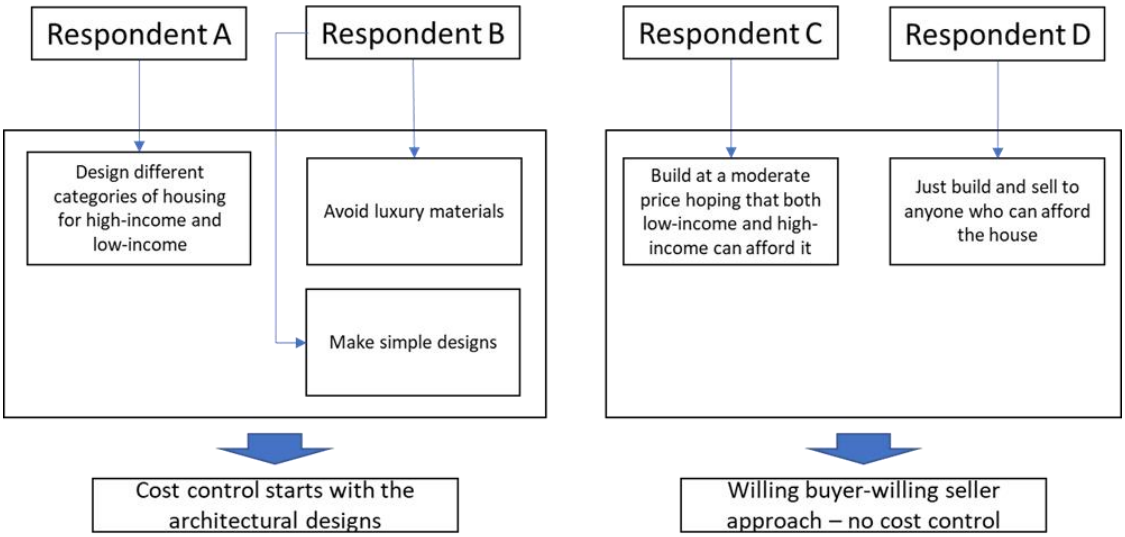

Figure 25: Approaches used in making housing affordable to low-income people in Enugu (Author, 2023)

The next issue addressed during the open interview concerned the practical procedures and tools to provide low-income housing to the people. There are both legal and operational procedures that developers follow to deliver a house to a low-income earner. The importance of the delivery method is that even if a low-income earner cannot pay for the house in one-time remittance, alternative arrangements (see the next paragraphs) can be made to enable the low-income earner to own the house. Those arrangements vary among developers and are designed in a way that enables the investors to recoup their capitals and make their target profits. Below are the responses from the selected experts.

First, respondent A noted that Enugu is predominantly occupied by civil servants. Therefore, their company uses the Enugu state civil service salary structure as the basis for determining

peoples' ability to pay for a house. According to respondent A: "*no civil servant in Enugu can pay for a house in one-off down payment based on their official earnings. In this case, the options are either to reduce the market price of the house or reducing the quality of building materials to lower the cost of the house. But if we just reduce the cost of the house without properly thinking of our input costs, we may incur some losses and may not be able to sustain our business. Also, if we just reduce the quality of our building materials to lower the cost, we will produce poor quality houses which would decay within a short period. Therefore, instead of reducing the market price of the housing or compromising on quality of the building materials to achieve low cost, we build good quality houses but offer mortgage plans to the low-income home buyers. We determine our mortgages in two ways: one is the age of the home buyer. We use this age to estimate how long the person may remain in civil service. Another way to the mortgage plan is to know the buyer's monthly income. We use the monthly income to estimate how much money the home buyer can pay monthly/annually within the mortgage period. For business owners and self-employed people who are not in paid jobs or civil service, we request their bank statements. From their bank statements, an average monthly income can be determined which could be used to plan their mortgages. Please note that we do not take collaterals from mortgage seekers. However, there is a provision in our contract to cancel the mortgage if the holder shows signs of inability to sustain the payments while being indebted to us over an unacceptable period*". The key issue here is that the developer does not just reduce the cost the house to make it affordable – they will lose profits. They also do not build houses with low quality materials to reduce cost – the houses will deteriorate faster. They simply build houses with good quality materials and sell them at the right prices relative to the cost of building the houses. However, the developer sells the houses on mortgages to enable the low-income buyers to pay conveniently on instalments over a long period.

Respondent B stated as follows*: "our company works with a few agencies who help our customers to secure loans without risk of fraud from scammers. Also, instead of transacting with individual home buyers, we transact with organizations or companies where our prospective home buyers work. Therefore, intending home buyers apply through their companies. Being identified with workplace confers high credibility on the home buyer and offers them higher chances of eligibility for loans from a mortgage institution."* This developer delivers their housing to low-income people on mortgages. However, the developer helps a house buyer to secure loans from trusted lenders and helps a lender to identify borrowers with verifiable identities. Therefore, the key issue here is reliability.

For respondent C, their company prioritizes outright sales/purchases for their houses but in a few cases, they use mortgages. Thus, respondent C explained their procedures for delivering housing to the low-income people as follows: "*we help our customers to secure mortgages with banks to enable them to buy their properties. To make the payment convenient, the mortgage taker pays back a maximum of 30% monthly and the allowable mortgage period is a maximum of 35 years. We also have an installment payment plan which is different from mortgage. In this case, our company agrees with the buyer on how many installments within which they can pay off the cost of buying their house. In this type of installment plan, we factor in the possibility of price fluctuations (for instance, inflation) and reflect those fluctuations on the cost of the housing within the payment period. This means, that if the market price of the house has increased within the payment period, it will be reflected on the remaining payments to be made by the buyer. Finally, we also have a "tradeoff" approach. In this method, people can buy a house without having money but can exchange other valuables that are useful for our company. We often do this with some building material suppliers. The supplier delivers materials to us but will not be paid. We then deliver a house valuing similar amount as the supplied building materials to the supplier. We also trade off with some of our workers. We may agree that they receive no wages, but we record a log of their services and measure them in monetary terms. Once their accumulated values of services can afford them a house of a similar value, we deliver the house to them*". The key issue here is provision of alternatives. This developer also helps their home buyers to secure mortgage loans but also provides them with other options towards acquiring the house without a mortgage. Among those alternatives, there is exchange of a house with other non-monetary values (such as labor and goods) that can be evaluated in monetary terms as a cost for their house. Also, the home buyer can pay for the house on agreed installments with the developer even if the buyer could not secure mortgages from financial institutions.

Respondent D explained that they build and sell only to outright purchasers. Quoting respondent D: *"we do not use any other approach. Therefore, we don't sell to anyone who cannot buy our houses."* The key interest of this developer is market demand and supply and not targeting any income group. This kind of approach leaves a potential home buyer with the entire responsibility to plan their finances to be able to own a home.

Therefore, in Enugu, different ways of delivering housing to low-income earners to ensure it is affordable are (see also fig 26):

i. Mortgage
ii. Instalment payments to the developer (not mortgage)
iii. Exchanging a house/apartment for some other agreed values/services (but not money)
iv. Outright sales

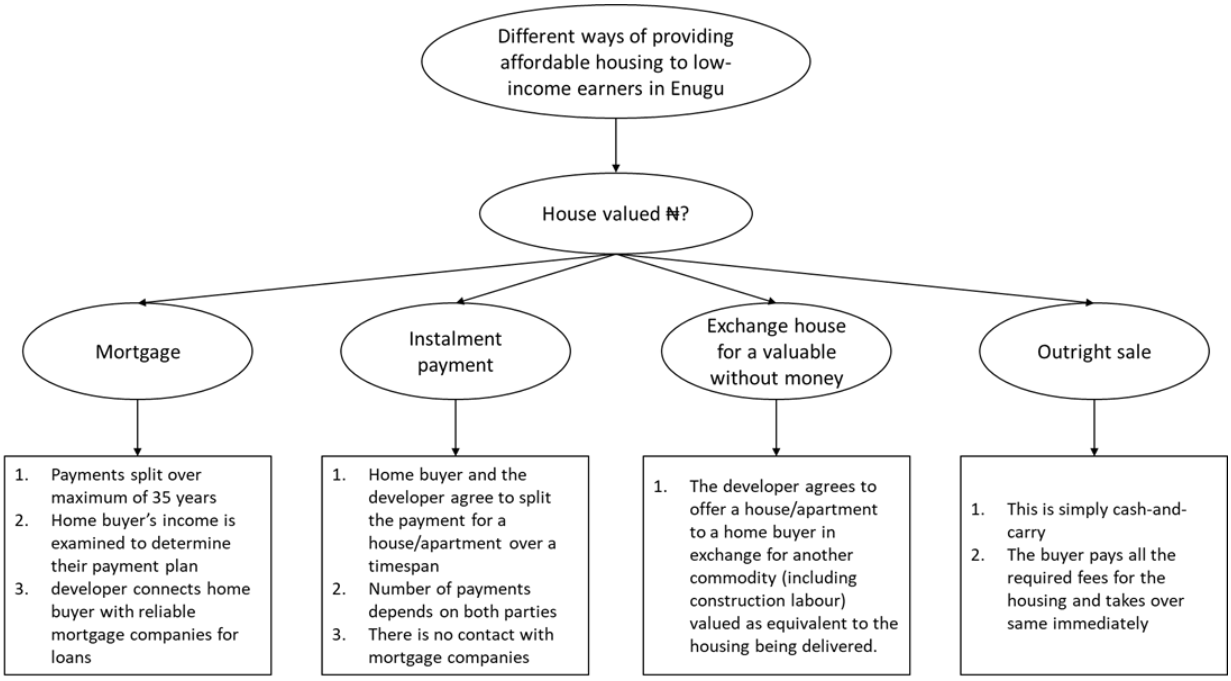

Figure 26: different strategies of delivering affordable housing to low-income earners in Enugu (Author, 2023)

In summary, none of the developers produce social housing because it does not yield profit all. On the other hand, all the 4 respondents mutually agree that low-income housing yields low profit. However, while all 4 respondents agree that low-income housing yields low profit, 3 of them produce low-income housing while 1 of them does not produce. For those who produce low-income housing despite its low profits, there are 3 major motivations/reasons: (i) one is that low-income housings which are mostly made as mass production reduces housing deficits; (ii) the other is that low-income housing is most viable in a low-income population; (iii) another reason is that with less money, a developer can invest in low-income housing and uses the proceeds to keep a company afloat while searching for high profit projects. Sequel to these mentioned motivations, each developer producing low-income housing has a criterion for determining a low-income housing to ensure that the cost burdens are fair on the low-income people. One group believes that housing can be affordable if the architectural designs are made simple (without complicated shapes and forms) so that the cost of construction would be low.

The other group believes that using just okay building materials instead of luxury materials makes the house affordable. Another group builds different categories of housing (bungalow vs storey building; small rooms vs large rooms; or mixed-use housing) using good building materials and they leave the buyers to decide which house of a certain cost they can afford. However, because low-income people are unlikely to buy a house in one-off payment, developers offer those houses to buyers either on one-off payment or piecemeal payment. For those who buy it on piecemeal payment, they can either do so through mortgage loans or through instalment payments to the developers over an agreed period. Whether mortgages or installments, payments are arranged to suit each individual buyers' financial conditions. In the absence of money, a property can be exchanged for a non-money value such as services or materials.

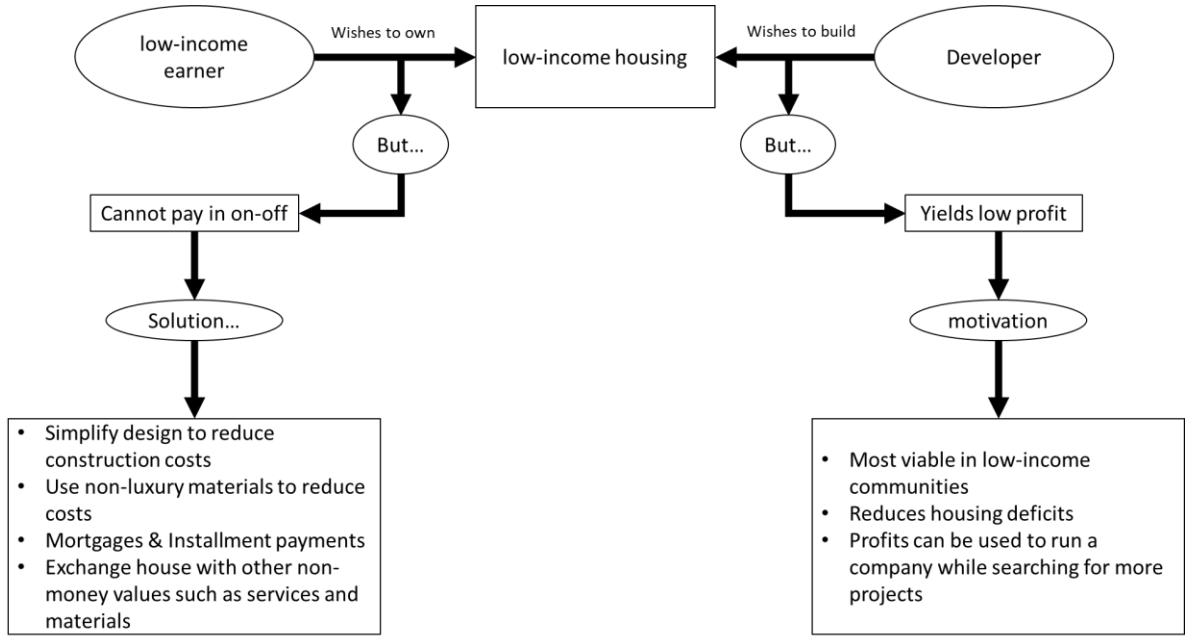

Figure 27: building/not building low-income housing (Author, 2023)

5.2.2 Historical and contingent factors contributing to motivations for low-income housing

In the original questionnaire, the different time ranges of experience among the experts were considered. The reason for these time ranges was the assumption that a company with more years of experience would also be more inclined to build low-income housing alongside regular housing projects. There were ranges of time intervals to choose from. They were: 1-5 years, 6-10 years, and 11years-above. The reason for choosing 4 years intervals in the ranges is because housing policies are supposed to be reviewed every 4 years. Thus, the question was used to

check if changes in the housing policy made any impact on the ease/difficulty of doing housing business in Enugu. If any of the respondents has practiced for above 11 years, they were required to explain how they managed to remain in business that long. Among the time ranges to choose from, all the respondents have been practicing for above 11 years. The following sections explain how each of them managed to remain in business for their respective lengths of time in practice.

Quoting respondent A: "*We have existed for 22 years. Housing policies have improved over these years, and we have also improved on our business experiences. For instance, in the past, we wouldn't accept offers of low-profit projects from clients. However, we later realized that we cannot always get only the high-profit projects. In fact, sometimes, the only projects we can get are the low-profit projects. In the past when we used to focus only on high-profit projects, we would lay of some of our staff if there were no or less projects and insufficient funds to sustain them. However, currently, instead of staying without a project while waiting for those big projects, we now accept some of the low-profit projects and use their proceeds to maintain our staff and service our business while we seek for other high-profit projects. By maintaining our staff instead of laying them off, we save on the cost of frequently hiring new staff each time we procure new projects. Those staff we maintain through proceeds from low-profit projects stay longer with us and we benefit from their work experiences which add more values to our company."* The key message here is that even though low-income housing yields low profits, such low-profit projects are higher in supply than the high profit projects. Hence, rather than shutting down, a company can sustain itself with proceeds from low-profit projects when properly managed. Therefore, most developers who closed their companies because of low profits from low-income housing might not have understudied the market well enough to operate in it. This further suggests that housing can be made more affordable for the low-income earners in Enugu if more developers could venture into low-income housing projects.

Quoting respondent B: "*We have existed for 12 years. Our founding principles were based on delivering high quality services and durable housings. So, over the years, many people have developed trust in us based on the durability of our buildings. Through this public trust, many beneficiaries of our good services have recommended us to newer costumers and this trend has continued to promote our good business image to the public*". The key issue here is that this developer does not compromise quality of building materials to achieve housing affordability. They believe that long-term effects such as breakdown or collapse of buildings

due to poor quality of building materials diminish the customers' trust in a developer. "*Also, we have improved in our business experience. For instance, some transaction mistakes we made in the past always put us to the risk of litigations in the law court. We noted that the time wastage and money spent during the court processes interrupted and delayed our progress. However, currently, we have developed safe ways of conducting our transactions which have helped us to reduce the resource waste on litigations. Our time and resources are channeled more on constructing and delivering housing to the consumers rather than on settlement of disputes*". The key message is the importance of adhering to all the principles/rules required to deliver a housing. This adherence reduces the possibility of the developer facing the law because of poor quality of work. Not going to the court means, saving a huge amount of time and money. The time saved can be used to commence new projects while the money saved can be applied in funding more projects. The accrual effect is that the company would produce more housing units in shorter times and recoup more profits from the housing delivered.

"*On the aspect of housing policy, we are a private company. We are not affected by the housing policy (changes or no-changes) since we do not depend on the government. The provisions of the housing policy do not cover private developers but simply address housing provisions by the government only*". The key message here is that the housing policy change is immaterial for a private developer since their fundings are also not from the state. Therefore, a private developer only needs to understand the market well enough to achieve their desired goals.

In summary, through long experiences, this developer has mastered the management of housing development projects to ensure quality control and durability. They have further benefited from the referrals of their older costumers to earn new clients.

Quoting respondent C: "*We have operated for 14 years. "Our passion is the main thing that has helped us to stay on. Our business experiences also improved over time. We now understand several sectors of the real estate business and we can manage every aspect of the business including small, medium, and largescale*". The key issue here is that this developer believes that technical skills alone are not enough to remain in housing business if there is no inner desire and interest to invest in affordable housing.

We started as a finishing company installing fittings and finishes on houses built by other developers. Later, we evolved to become a construction company. Gradually, we became sub-contractors for real estate developers and later as an independent real estate company. The

main point is that we started as a small team, got some experiences, and gradually expanded in both our staff-number and market worth. We take feedbacks from our critics seriously as a way of helping us to improve on our mistakes". The key message here is that even if an entity cannot operate as a construction/real estate company due to lack of resources, they can still support affordable housing provision as a sub-contractor by providing on-demand services such as supply of the labors needed by developers to deliver a housing scheme. Over time, a service company could grow in experiences and generate more capital to evolve into a proper real estate developer.

In summary, the key messages here is the need for consistency in one's area of business. This is such that over a long time, the business operators would build many experiences, grow more capital, and establish better reputations upon which they would thrive to achieve their goals.

Quoting respondent D: "*We have been practicing for 50 years. Our business experiences have kept on improving. We have also developed sources of internal income generation so that we do not rely solely on government funds which is not always enough to run our proposed projects. As part of the internal income generation strategies, property owners within their estates pay ground rents throughout their tenures on our property. We use incomes from the ground rent to maintain the estates. Also, the incomes we generate from developed properties are used to develop new ones and the spiral continues, keeping the company on a steady growth*". The key message here is that housing business does not end after sales. A company can still earn money from the after-sale services (maintenance and management) they provide to their customers. Maintenance and management are done to control decay and dilapidation (slums) in the estates. Incomes from after-sale services help the developer to pay their staff and to keep producing more housing units.

"*As part of generating other sources of funding, we engage in Public Private Partnership scheme (PPP) was introduced by the Enugu state government in 2007 to encourage private developers to invest in real estate. For example, we can contract private companies to develop some of the estates for the government under some agreed terms. This is believed to have reduced monopoly by the government; and have introduced competition in the housing sector*". The key message here is outsourcing and fair competition. A company can be overwhelmed by the load of trying to do everything alone and thus, compromise on the quality-of-service delivery, owing to non-specialization in the services the company renders. However, outsourcing to other sub-contractors would reduce the burden on a company and position them

better to checkmate the sub-contractor to whom a job is outsourced using the design specifications as a checklist. With each sub-contractor addressing less workload, attention to details may increase, and consciousness of delivering a good job to attract future projects would increase.

In grand summary, all the 4 companies which were interviewed have existed for more than 11 years – a possibility that they have survived, at least, two government regimes and 3 housing policy changes. It is also likely that many housing development companies in Enugu tend to shut down before their eleventh year. This further implies that those companies that live beyond 11 years would have survived by adapting themselves to cope with the same situations which caused the others to shut down. These adaptations were possible based on the individual experiences of those companies. Therefore, their experiences show that:

1. Companies which deliver good quality housing earn the trust of their customers who further recommend them to new customers.
2. All developers agree that low-income housing returns low profits to investors.
3. 1 developer out of 4 does not build low-income housing due to low profit while the others 3 build it but create other sources of incomes to enable them to sustain their businesses even when the profits from sales of houses are low.
4. Developers sell houses but retain the management of their estates to ensure proper maintenance of the housing and to avoid slum emergence.
5. Companies try to avoid wastes (of time and resources) during housing development and delivery. This helps them to retain more money than they would have had had they spent them on litigations and repair of poorly built structures.

5.2.3 Durability factors

As for the durability and sustainability of housing projects, the main issue was to trace the factors which would contribute to either preventing or causing slums. The intent of this question was to understand two things from the respondents: (i) if they have records of houses-turned slums – what caused them; or (ii) if they have no slums – how they managed to prevent slums. All the 4 respondents answered “NO”. They said that none of their previous housing developments have/had turned into slums. While all the respondents indicated that none of their previous housing developments had turned into slums, they respectively explained how they managed to keep away slum emergence or incursion into their housing developments.

Respondent A answered as follows:

1. *We do not build estates and hand over totally. Rather, we retain the management aspect of our estates to ensure that we maintain them by our standards. For instance, we monitor our estates to ensure that people comply with the rules and regulations guiding usage and occupancy of our estates. We noted that in the old government housing estates, there were several alterations and modifications of existing houses. This contributed to their turning into slums, and we attribute this to poor management. To manage our estates effectively, we have inspection offices in all our estates where our inspection officers occupy so that we can monitor alterations and modifications in our estates from within. This helps us to see the problems directly rather than relying only on reports which might be inaccurate or delayed sometimes".* The key issue here is monitoring user behaviour. Noting poor management as central to the cause of uncontrolled modifications and alterations in the older estates, this developer focuses more on preventing uncontrolled modification and alteration of houses in their estates. They established monitoring teams in their various estates to inspect houses regularly against any tamper to the original design. The core interest of the developer is to sustain the aesthetics and visual appeal of their estates to uphold their good reputation of owning slum-resilient estates.
2. *Apart from monitoring our estates, we also have rules guiding our housing prototypes. We have un-expandable categories which you are not allowed to alter when you live in them. We also have expandable categories which you are allowed to alter but with approval from our office. These categories will be clearly written in the contract when you buy the house. We also supervise the alteration and modification of designs to ensure that the people stick to what was approved for them. We made these rules to prevent users from mutilating the houses and facilities in our estates as they wish.*". The key issue here is a legal framework (user guide) and its implementation. This developer believes that durability does not end with building a house with high quality of building materials but also includes observance of the user-guidelines (legal framework) after construction to forestall misuses which cause damages and breakdowns. The legal framework is the different housing prototypes and the rules set out for the occupants to follow in modifying or altering existing structures. The implementation is the supervision of the building process to ensure that users strictly comply with the specific approvals for modification they received.

3. "*We also collaborate with the occupants by forming occupants' associations. Through these associations, the occupants meet, discuss, and suggest ideas for effective management of the estates. Therefore, through routine maintenance and proper monitoring of alterations in the estates, slums are forestalled. We also build recreational centres in our estates*". The key issue here is participation and inclusion. Thus, the occupants participate in monitoring the estates and bringing ideas for decision-making in the property management. Therefore, management of this nature prefers general interests over personal interests.
4. "*Our housing prototypes are designed with fences included in them. The older estates did not have fences included in their designs and now look bad as many occupants are adding fences to secure their properties*". While there are those who are "for" and those who are "against" fencing a property, the issue here is about incorporating what the existing users of previous housing schemes have often introduced even when it was not part of the original designs. Without fences, all external spaces might appear as public spaces. However, past experiences (as in section…) show that public spaces are poorly managed. Therefore, through fencing, there would be a clear delineation of spaces per household. Each delineated space becomes an exclusive responsibility of its occupants to take care of – this is as opposed to unfenced spaces which would pose a confusion over where another person's use rights and responsibilities stop. In minor cases, fencing also provides security to the occupants.

"*Because of the successful management of our estates against slums, the Enugu state government has hired us as their consultants on housing development. Our main role is to provide advise on how to manage existing government housing estates to combat slums. However, we can only advise the government but have no powers to enforce those advise. Therefore, if there are still slums in the government estates, it is the failure of the government to implement our recommendations*". The key message here is that the management model of this developer has been tested, trusted, and are becoming more acceptable to both the state and other developers.

Respondent B answered as follows:

1. "*We solved the problem of slum incursion by studying the design, implementation, and management failures of the older (existing) estates. For instance, some of the older estates we studied experience huge traffic jams. We discovered that part of the reasons*

for the traffic jam was that the older estates had narrower access roads due to the era they were designed. To solve such problem, we provided wider road networks. In providing the wider road network, we considered possible population increase and possible future development of unbuilt areas around our estates". Here, the key issue is on spatial planning. The developer considered proper spacing and functionality of the land layout as very crucial in achieving a slum-free neighbourhood. They further considered the influences of surrounding properties that are not covered by their estates and designed their estates to work in harmony with those surrounding properties. Therefore, this developer pays attention of the community circumstances before deciding how their estates would be designed.

2. "*We also noticed that change of use or alterations were common in those old estates we studied. We control change of use and alterations on our existing housing developments by providing restrictions or scrutinizing some proposed alterations before approving them in our estates. Above all, we ensure that we implement our plans (designs) appropriately and effectively*". For this developer, providing a legal framework guiding land use changes and modifications on housing units is important to keep the estate organized and prevent slums from occurring. They considered problems with the past housing schemes as reference in developing the legal framework.
3. "*On another note, we discovered that some of the older estates do not have proper zoning defining different activities like commercial, recreational, and so on. We solved this problem by making sure that we have commercial area and residential areas in our estates properly defined. Furthermore, to help the larger Enugu metropolis solve the rapid slum incursion, our company secured a large expanse of land on which we are currently planning to develop solely as an industrial area*". For this developer, spatial planning is crucial. Spatial planning provides a layout design outlining appropriate zoning of activities. This is to guide infrastructural developments and prevent developers from erecting structures arbitrarily. Therefore, solving slum problems can start from the beginning through a thorough schematic planning and designing.

Respondent C answered as follows:

1. "*None of our estates has turned to slums. May be because we are not too old in the industry. I think it is too early to judge. But one reason we do not have slums is because we have learnt from the mistakes of others and applied the knowledge in making our estates function better*". The key issue here is the developer's attention to past failures and their correction of those failures in their newer estates. Thus, although this developer is new in the business, they work with individuals who are experienced in housing development so that their newness in the business would not be a disadvantage in terms of experiences necessary for developing slum-proof estates.
2. "*But I believe we will not allow our estates to become slums because we rely on referrals from previous costumers who help connect us to new customers. So, we do not want potential customers to see our estates decay badly into slums. Therefore, we work hard to ensure that we deliver high quality and durable houses*". The key issue here is about interest of the developer to attract more customers (homeowners or renters), and one major attraction is absence of slums. Therefore, they would ensure that slums are prevented in their estates.
3. "*Additionally, we form estate associations with the occupants of our estates. Those occupants help us to control misuse of our properties by reporting a member who does not comply with the estate rules. One example of our estate rules is that you cannot paint your chosen colour apart from the estate colour codes as specified. Another rule is that we have standardized heights for fences in our estates and such heights cannot be exceeded. We also control modifications like adding new rooms to an existing house. In the larger neighbourhood, we provide designated places for shopping malls or commercial activities. Therefore, you cannot site your shops anywhere you like in our estates*". The issue here is participatory policing. Occupants are involved in monitoring one another over misuse of properties and facilities in the estate. Additionally, this developer prefers private management of spaces over public management and effects that by use of fencing for demarcating one property from another. Fencing here is not for security but rather for delineation of spaces. Therefore, they have regulations on maximum heights of fences to allow good views of housing units in the estates.
4. "*Most importantly, we ensure strict compliance with the Nigerian building code. The building code is our basis for determining how good the quality of our houses is*". Here, the key message is that all this developer does are done in compliance with the legal

framework of the state. Therefore, one can argue that no matter how good a solution is, it will be difficult to apply if it conflicts with the established laws and regulations in the locality. Hence, attention to conflict of interests must be paid to avert delays and interferences by the law-enforcement agencies which could lead to abandonment of construction. Prolonged abandonment has been identified as one of the leading causes of slum. The key issue here is assessment framework. The assessment framework is used to check if there is compliance or violation of standards in carrying out a process – here, the Nigerian building code is the assessment framework. This developer always ensures that their housing development and management fulfil the requirements of the Nigerian building code. They believe that following those guidelines would prevent their estates from turning into slums.

Respondent D further answered as follows:

1. *"There are no slums because we maintain our estates. The maintenance is funded by the ground rents we collect from the owners of properties in our estates.* The key issue here is maintenance and funding the maintenance. This developer understands that maintenance requires a source of financing. Finances will be used to pay for the services of the people working to maintain the properties. Finances will also be used to purchase the tools and materials needed for the maintenances. Absence of finance would mean inability to conduct the maintenance, while non-maintenance of the deteriorating parts of the estate leads to emergence of slum.
2. *We also control development from the beginning by designing the housing prototypes for our estates by ourselves so that even if a property buyer wants to self-build, they must build with our designs. We follow up by monitoring the implementation of our designs to ensure that self-developers comply with our standards".* The key idea here is attention to both micro and macro planning as important in preventing slums. micro planning refers to the spatial (masterplan) while the micro planning refers to the individual housing units therein. This developer has studied causes of slum in the past and developed housing models among which a home buyer would choose from to build instead being allowed to bring their own designs. By building within the stipulated prototypes, this developer can easily monitor self-developers' compliance with the specifications and address deviations to prevent slums.

Figure 28 summarizes how different developers address durability issues in their housing development.

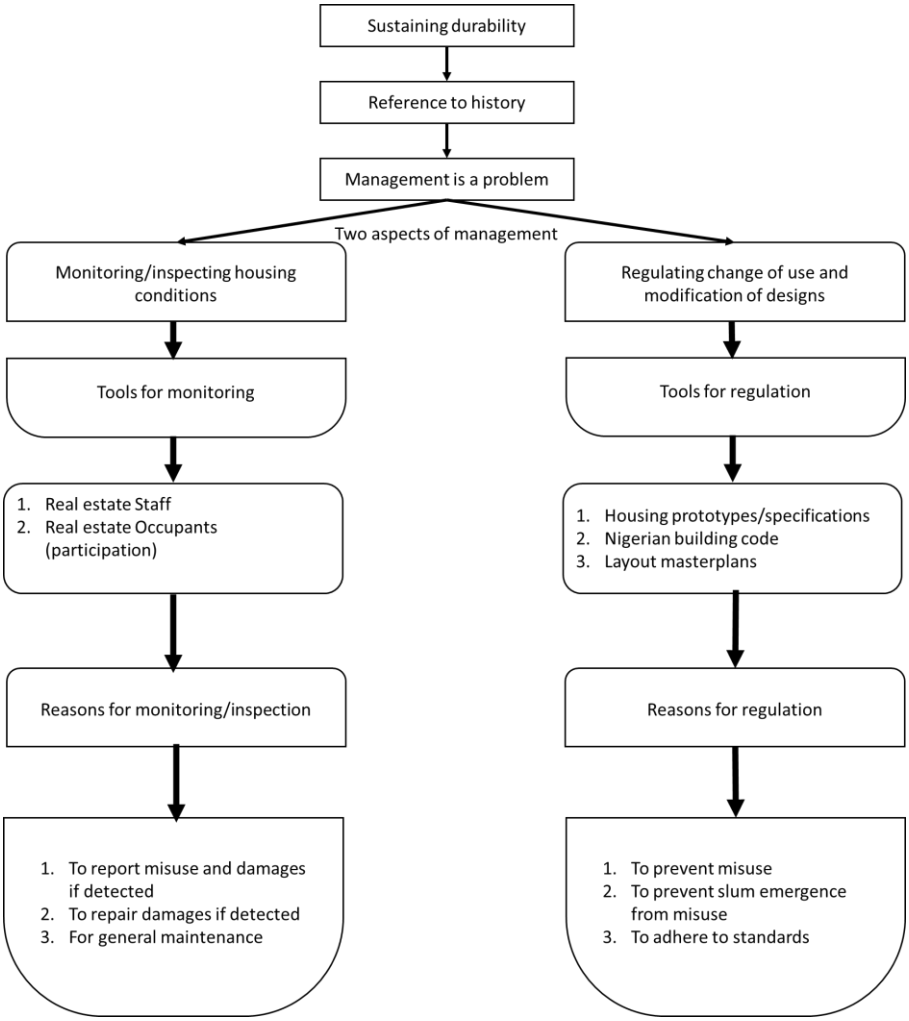

Figure 28: how different developers address durability of their estates (Author, 2023)

From data collected, all the respondents based their solutions on history – those are the historical facts about older government housing estates which have shown signs of degeneration into slums. What those developers did in common was that they studied the problems/failures of the previous housing estates that turned into slums. Emerging from their respective studies, all the developers seem to agree that poor management was central to the degeneration of those older government-owned estates into slums. Hence, the developers introduced the following solutions into their newer estates:

1. Developers sell houses in the estates but retain the management aspect of the estates to ensure constant maintenance with uniform standards. These maintenance services are

funded from the annual ground rents collected from the occupants. Therefore, occupants don't pay any extra fees for these management services.

2. Occupants are required to join the "Occupants Association" – through this association, it is quicker for occupants to report damages or defaulters, discuss problems and solutions to the challenges in the estates.
3. There are restrictions to change of use and modifications on the original designs of housing prototypes in the estates. This is to avoid defacing of the aesthetics of the estate scenery.
4. Roads in the estate are made wider to contain heavy vehicular traffic without prolonged gridlocks.
5. Company designs housing prototypes for their estates and ensures that each land buyer builds them to specifications.

5.2.4 Role of strategic and operational planning in achieving set target number of housing units

The role and/or importance of strategic and operational planning was addressed through discussing if (or how) each of the developers relied on systematic indicators and monitoring systems to evaluate their progress and strategic targets. From this discussion it would be possible to ascertain if failure to achieve target number of housing units (as claimed in chapters 1 and 2) contributes to emergence of slums.

All the respondents indicated not having any problems in reaching their targets. This means that all of them have always achieved their target numbers of housing units in every housing scheme they planned. Each of the respondents further explained how they achieve their set targets respectively.

According to respondent A: "*we always achieve our target number of housing units because we can work it out in phases instead of building all at once and failing to achieve them. Funds generated from the previous phase are then used to finance the next phase; and so on. By building in phases, it enables us to ensure that the already completed houses are delivered and occupied. By being occupied, the occupants are likely to ensure that the houses are maintained. This is because occupants would report breakdowns or repair those breakdowns themselves as opposed to when a house is unoccupied*". Here, it is about planning with scarce resources to achieve bigger targets in bits. In managing the scarce resource, the developer targets number of housing units but just builds a few of them which the available funds can finance – the rest

are built later when more funds are generated. Some of the funds would be generated through the sales and rents of the already completed housing.

According to respondent B: "*we always achieve our target number of housing units because we plan our development only within available resources*". This developer thinks that their targets should only be limited to the amount of money they have. A flaw to this approach is that they miss out on a chance to obtain bank loans or other external inducement funds to enable them to pursue higher targets. However, an advantage is that the targets can be delivered on time (all things being equal) because the funds are readily available.

On the other hand, respondent C explained: "*the answer is simple! We plan and build only with the money we have. If we sell the ones we have competed, we can build more with the money we realized from the sales*". This developer totally aligns with respondent B.

Similarly, respondent D answered: "*in fact, we will never achieve below our target because people are always coming to buy houses from us. Because of this high demand, some people pay for the houses even before they are built. So, we always have funds to develop our target number of housing units*". For this developer, the speed of implementation is important because they experience rapid sales turnover. Therefore, to keep their costumers satisfied, they constantly produce houses since the buyers always outnumber their production.

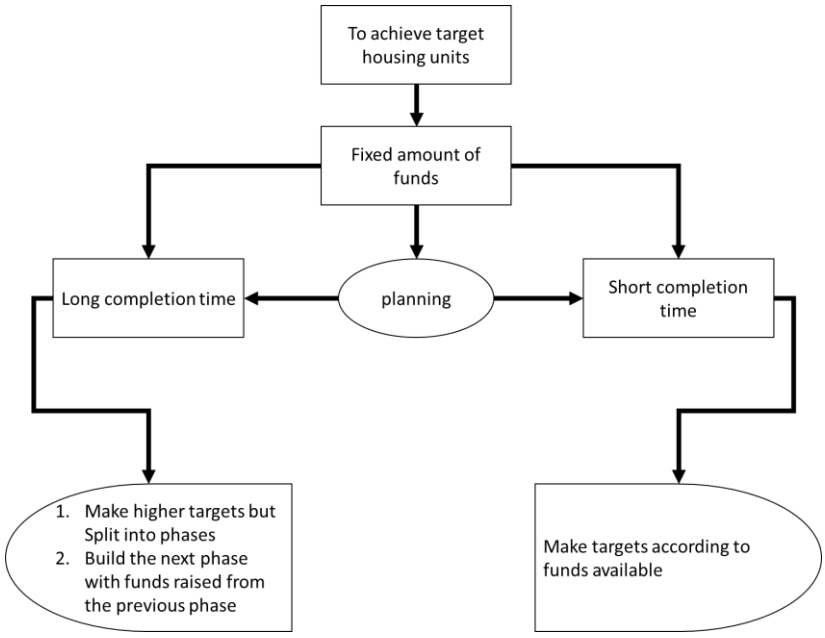

Figure 29: different strategies employed by developers to achieve their set targets (Author, 2023)

In summary (see also figure 29), the respondents indicated that they always achieved their target number of housing units in each scheme. All the respondents seem to align to the notion of "planning" as the tool for achieving their targets. This implies that they thoroughly analyze set targets to ensure they are feasible before embarking on such projects. Among their various approaches to feasibility:

1. One group would target higher number of housing units but splits those targets into smaller phases because of limited funds compared to their targets. Hence, each phase is funded by the finances generated from the sales/rents of already completed phases.
2. The other group would simply limit their target number of housing units within their readily available funds to avoid challenges of non-completion.

5.2.5 Degree of uncompleted/abandoned housing projects.

Just as chapters 1 and 2 claim that uncompleted and abandoned housing developments contribute to slum generation. This question was used to find out if some of the respondents experienced such issues of not completing or abandoning some of their housing developments.

All the respondents indicated that none of them has records of uncompleted or abandoned housing development projects. They further explained how they respectively achieved their successes.

Respondent A answered thus: "*NO! Like I said before, we plan before we build so we do not have uncompleted or abandoned projects*". The key message here is that this developer does thorough pre-construction exercises to address any issues that can sabotage the completion of a construction project once started. Pre-construction is beyond mere designing and budgeting correctly for procurement of materials and payment for labors. Pre-construction job extends to clarifying the legitimacy of a tenure held on the land for the construction site. It also includes resolution of community/individual interests which would conflict with the proposed construction. For instance, if there is a community protest over the proposed/on-going construction (especially the violent protests), a developer is unlikely to remain on site to continue construction. If such dispute lingers, a developer may abandon such project. Such abandoned sites gradually turn into slums because of decaying and withering of unprotected building fabrics.

Respondent B answered as follows: "*We plan well before we start any project. For the older estates in which you see uncompleted and abandoned houses, there were poor planning,*

government interferences and political instability. Those factors do not affect us because we are a private company and not government". The key message here is total avoidance of external interferences and independence on the government to deliver a housing project. Thus, as a private entity, this developer is more likely to operate without interruption caused by sudden change of government as a project proceeds – this is as opposed to a government company which may change its board members, consultants, or contractors because of change in political regime. This sudden change of leadership could cause loss of vital information during handover to new project team. It could further stunt the progress of a project and might frustrate the project executors into quitting and abandoning an on-going project.

Respondent C answered thus: "*There is nothing much to say. But I think it is because we build within our budget*". This developer considers financial planning as the only important aspect of ensuring that a project does not get abandoned. However, other factors such as land conflict, natural disasters or insecurity were not mentioned. Maybe because of their peculiar context (no natural disasters, no land conflicts, no insecurity), those unaddressed factors do not matter.

Respondent D also has no record of uncompleted/abandoned construction and explained further thus: "*we always complete our projects. The worst that can happen is that if we have challenges completing the project because of funds, we can build the house to the roofs and sell them to interested buyers. The buyer will then do the finishing of the houses to their tastes while complying with our specifications*". This developer understands the dynamics of a project and makes provision for decision-making in-case of happenstances (such as inflation and bankruptcy) that could impede or terminate the completion of a construction.

In summary, based on the data collected, none of the respondents have records of abandoned or uncompleted housing developments. Summarily, their common reason is that they always plan well to ensure that they only embark on feasible and achievable housing schemes. Therefore, just as planning is central to achieving target number of housing units, it is also central to ensuring the completion of proposed projects instead of abandoning them (including completed but unoccupied) or not completing them (occupied without finishing).

5.2.6 Choice of location of estates

When all the housing estates owned the government were mapped, they seem to be concentrated around a common center despite their spreads across all the three Local Government Areas of Enugu urban. The experts were asked if there was any planning regulation or other logics behind such flux of housing estates in those centers.

Only respondent B answered this question – the rest said that they did not know why.

According to respondent B, *"It is simply about where lands are available. But the core interest is to expand the city"*.

5.2.7 General comments from respondents

As a semi-structured interview, respondents were not restricted to answer in certain ways but were simply guided on the focus of the data collection. Thus, the respondents were allowed to freely comment on areas they felt the interview did not cover. Below are their respective comments.

Respondent A: "*Housing estate is one of the key vital sectors in Nigeria that people need to invest in. Building estates is better than private single-unit housing developments. Estates promote community lifestyle while private single-unit housing developments could promote class divide. Communities are no longer together because of isolated living, but estates will naturally form communities which will integrate and unite people. Estates build connections and makes life easier for people to build trust and familiarity among one another*". The key issue here is integrating and uniting people. Uniting is important because of the heterogeneity of an urban population. This heterogeneity goes beyond mixture of cultures – it extends to social class divides and includes professional differences. A housing estate is built like a community with its own facilities (especially the jointly used external spaces). Those jointly used spaces bring people together, create familiarity among them and eliminate segregation among different people. This allows them to work together to achieve some common goals.

Respondent B: "*Trade unions have been protesting for increase in workers' minimum wages in Nigeria. Workers' salaries are stagnant, but costs of commodities are rising while incomes are not. Hence, housing affordability keeps reducing as time progresses. Therefore, some developers tend to compromise on quality to deliver affordable housing to low-income earners. Houses built with such poor-quality materials are likely to turn into slums; but researchers like*

you can help us find solutions to this problem". The key issue here is people's low purchasing power. Furthermore, there is a subtle acknowledgement that some developers build poor quality estates that turn into slums owing to their quest to make the housing cheap and affordable to the low-income earners. It seems that experts may have exhausted their ideas on how to make housing affordable without compromise on quality. It implies that good quality housings are still not affordable to the low-income population in Enugu. Therefore, a low-income earner can only afford a poor-quality housing because their incomes cannot afford them the good quality ones.

Respondent C: "*I have no additional things to say*"

Respondent D: "*since housing is a necessity, I would like researchers to work more on low-income housing research ideas. We stopped investing on low-income housing because it was not profitable to us at some point. We would like you researchers to develop innovative solutions that would make low-income housing estates attractive to investors like us*". The key issue here is that affordable housing is unprofitable to investors. However, many people would like to invest in affordable housing if they can make good profits from it. This developer opines that existing ideas on affordable housing have been seemingly exhausted but none of them enables an investor to recoup high profits. Therefore, they need new ideas backed by research on how to make affordable housing profitable to investors.

Inferring from the general comments, one group advocates for participation of more investors in affordable housing production while the other group advocates for introduction of new research-based ideas into affordable housing development.

The advocates of participation of more investors in affordable housing suggest that residences built as estates promote community living and unity among people. On the other hand, the advocates of new ideas for affordable housing delivery suggest that the current ways of delivering affordable housing create a conundrum whereby if it becomes affordable to the low-income people, it becomes unprofitable to the investors and vice versa.

Combining these different views on affordable housing, one could understand that currently, there is shortage of affordable housing supply in Enugu because it is not profitable to the investors.

5.2.8 Synopsis of the Expert interviews

Based on the 4 developers interviewed, 3 of them build low-income housing while just 1 of them does not build. Therefore, results of expert interviews were based on these four selected respondents.

1. Both those who build and those who do not build low-income housing mutually agreed that low-income housing yields low profits. Thus, those who do not build low-income housing avoid it because it returns low profit. However, those who build low-income housing do so because Enugu is predominantly a low-income community and has larger market for low-income housing than for high-income housing.
2. All the expert respondents have practiced for more than 11 years. Therefore, those developers must have survived about 3 housing policy changes or 3 government regimes. Although each of the respondents has their unique stories, what is common among all of them is that they have all improved over time by adapting to constantly changing economic conditions and policies. Thus, experience matters for any developer to remain long in business.
3. None of the expert respondents reported a record of their delivered housing schemes turning into slums. To achieve slum-free housing schemes, those who build low-income housing estates studied the problems experienced in the older (previous) government housing estates.
4. To understand why some of them turned into slums. Thus, the respondents seem to agree on the following loopholes as causing slum formation in the older housing estates:
    a. Poor planning
    b. Poor maintenance and management
    c. Poor road network in the estates
    d. Uncontrolled change of use, alterations, and modifications
5. None of the expert respondents reported not meeting their target number of housing units in their respective housing schemes. Based on their respective answers, they always plan thoroughly to ensure that they only target the number of housing units they can deliver within their target time. The two forms of planning all of them adopted were:
    a. planning for short completion time (one-phase action)
    b. planning for long completion time (in two or more phases)

6. None of the expert respondents reported records of abandoned or uncompleted buildings in their estates. Also, they attribute these successes to thorough planning to ensure that they do not start projects they cannot complete.
7. All expert respondents seek other new innovative ways of delivering affordability to the people as the existing solutions are no longer adequate.

Sequel to the responses from the experts, there seem to be no signs of slum formation in the different housing estates they manage as private entities. However, their responses seem to agree that there are signs of slums in the government-owned housing estates. Therefore, the common opinions expressed by the experts as causal of slums in the existing housing estates are as follows:

a. Poor planning
b. Poor management

Sequel to the conflicting experts' opinions on whether the government-owned housing estates are turning into slums or not, further investigation (as reported in section 5.3) was done to seek the residents' views on whether there is slum presence/emergence in the housing estates.

5.3 Residents' views on affordable housing

To further investigate into slum presence/emergence in the housing estates in focus, non-expert data was collected from households in the study area using structured survey to sample their views against the experts' views. The implication was comparing producers' (experts') views against users' (non-experts') views.

5.3.1 Questionnaire structure

Table 12 reports the data collected from non-expert respondents using structured questionnaire. The respondents answered 24 questions in relation to the five attributes of a slum (Un-Habitat, 2006). Those attributes of slum are as follows (see also chapter 4 – section 4.4.2):

1. Durable housing of a permanent nature that protects against extreme climate conditions (on questionnaire as "durable housing of permanent nature").
2. Sufficient living space which means not more than three people sharing the same room (on questionnaire as "sufficient living space").

3. Easy access to safe water in sufficient amounts at an affordable price (on questionnaire as “easy/sufficient access to services").
4. Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people (on questionnaire as “access to adequate sanitation”).
5. Security of tenure that prevents forced evictions (on questionnaire as “tenure security/housing affordability”)

5.3.2 Allocated questionnaires vs collected questionnaires

The estimated sample size for this data collection was 378 households (or questionnaires). The allocated distributions across the three Local Government Areas of Enugu urban were:

a. Enugu north – 13 estates – 182 questionnaires
b. Enugu south – 3 estates – 42 questionnaires
c. Enugu east – 11 estates – 154 questionnaires
d. Total allocations – 378 questionnaires

Additional to the estimated questionnaire allocations, 20 extra questionnaires were added to the allocation of each LGA to compensate for possible invalid questionnaires or damaged copies due to handling. Therefore, the questionnaires returned/answered after distribution were as follows (see also fig 30):

a. Enugu north – 13 estates – 159 questionnaires
b. Enugu south – 3 estates – 58 questionnaires
c. Enugu east – 11 estates – 137 questionnaires
d. Total questionnaires returned – 354 questionnaires.

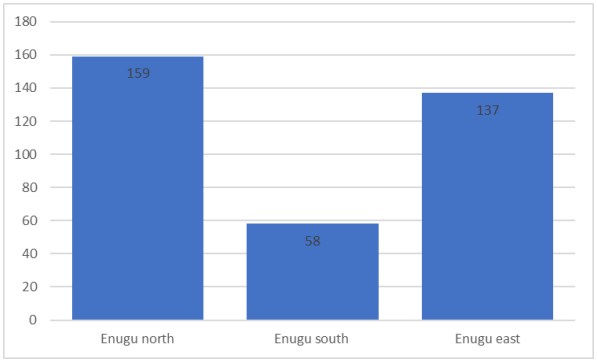

Figure 30: Questionnaire distribution by local government areas (Author, 2023)

Using excel, all the questions were tabulated against their corresponding responses for ease of reading (table 7). With normal eye inspection and basic pondering, one can make some preliminary impressions from the tabulated data collected. However, conclusions cannot be drawn immediately without further analysis. This is because while table 7 presents all the responses, it does not show how different factors impact on one another. However, the table (in excel) sets the precedence upon which further analysis can be conducted.

Questions	Total	% response
1. Local government of the estate/household visited		
Enugu north	**159**	45
Enugu south	**58**	16
Enugu east	**137**	39
2. do you own or rent your apartment?		
own	**156**	44
rent	**198**	56
3. If you own your apartment, how did you acquire it?		
Bought already built house	**66**	42
Bought undeveloped parcel and built	**56**	36
Bought uncompleted building and finished it	**34**	22
Inherited, lottery, gift	**0**	0
4. if you are a tenant, how much rent do you pay in 1 year?		
₦300 – ₦400 thousand	**136**	68
₦401 – ₦500 thousand	**54**	27
₦501 – ₦600 thousand	**4**	2
₦601 – ₦700 thousand	**2**	1
ABOVE ₦700 thousand	**2**	1
Free, squatting, living with relative	**0**	0
5. if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year?		
₦300 – ₦400 thousand	**154**	79
₦401 – ₦500 thousand	**40**	20
₦501 – ₦600 thousand	**0**	0
₦601 – ₦700 thousand	**0**	0
₦700 thousand – ABOVE	**2**	1
6. at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase?		
₦15 – ₦20 million	**192**	80
₦21 – ₦25 million	**40**	17
₦25 – ₦30 million	**2**	1
above ₦30 million	**0**	0
NONE OF THE ABOVE	**4**	2
7. how many bedrooms are there in your house/apartment?		

1 room apartment	**76**	21
1 bedroom	**12**	3
2 bedrooms	**140**	40
3 bedrooms and above	**126**	36
8. How many people live in your house/apartment?		
1-3 persons	**0**	**0**
4-6 persons	**245**	**70**
Above 6 persons	**105**	**30**
9. Within your estate, do you have some recreational centers/playgrounds?		
Yes	**132**	37
No	**222**	63
10. Do you have some green areas (with trees/flowers) for relaxation within your estate?		
Yes	**128**	36
No	**226**	64
11. do you clean your sewage by yourself?		
Yes	**188**	53
No	**166**	47
12. if no, in your opinion, who should take care of your sewage?		
The landlord/lady (if you are a tenant)	**65**	33
Self	**41**	21
A government agency	**85**	43
Others	**5**	3
13. does your neighbourhood have functional drainage channels (gutter)?		
Yes	**180**	51
No	**174**	49
14. if no, why?		
not included in the design from the beginning	**106**	61
constructed but damaged	**54**	31
constructed but blocked with wastes or unauthorized constructions	**10**	6
Others	**4**	2
15. is your house/apartment connected to the central water supply?		
Yes	**116**	33
No	**238**	67
16. if no, where do you get your water?		
Well/boreholes	**136**	68
Tanker/truckers	**51**	26
Mobile water vendors	**12**	6
Others (specify)	**0**	0
17. How far away is your house/apartment from hospitals/health centers/clinics?		
Walking distance (less than 10 minutes)	**52**	15
11 – 30 mins drive	**210**	59
31 mins – 1 hour drive	**92**	26

1 hour and above	**0**	0
18. How far is your house/apartment from a nursery/primary school?		
Walking distance (less than 10 minutes)	**56**	16
11 – 30 mins drive	**166**	47
31 mins – 1 hour drive	**124**	35
1 hour and above	**8**	2
19. How far is your house/apartment from markets and shopping centers?		
Walking distance (less than 10 minutes)	**34**	10
11 – 30 mins drive	**168**	47
31 mins – 1 hour drive	**146**	41
1 hour and above	**6**	2
20. How do you access internet services?		
Free Public Wi-Fi	**42**	12
buy data bundles	**304**	86
free data from telecoms	**8**	2
free/paid internet from the estate management	**0**	0
others (specify)	**1**	0
21. What is the condition of access roads to your estate?		
Earth road (narrow)	**80**	22
Earth road (wide)	**70**	20
Tared/paved road (narrow-good)	**52**	15
Tared/paved road (narrow-damaged)	**88**	25
Tared/paved road (wide-good)	**46**	13
Tared/paved road (wide-damaged)	**18**	5
22. is there consistent/routine repair of roads in your estate?		
Yes	**26**	7
No	**328**	93
23. are there serious breakdowns/damages to your house/apartment?		
Cracked wall	**76**	21
Leaking/damaged roofs	**159**	45
Broken/no windows	**4**	1
Broken/no doors	**0**	0
Fire burnt but not renovated	**0**	0
Others (specify)	**117**	33
24. If there is a damage or breakdown in your apartment, how long do you have to wait for the repairs to be done?		
0 – 7 days	**14**	5
8 days and above	**166**	62
Never repaired	**76**	28
Repair and receive refund	**12**	5
25. whose responsibility is it to repair breakdowns in your house?		
the landlord/lady (if you are a tenant)	**150**	42
self-funded	**162**	46

a government agency	**16**	5
Repair and receive refund	**26**	7

Table 11: questionnaire responses by various households (Author, 2023)

Based on the non-expert data reported on table 11 above, a preliminary interpretation of the results was made to set the pace for further analysis and more in-depth interpretation later.

5.3.3 Tenure security/housing affordability

Tenure security is strongest when an occupant owns a property and weakens varyingly depending on the duration and types of tenancy the occupant holds. Therefore, tenure security in this research context refers to the extent to which an occupant can remain in a property without fear of displacement. This sense of stability in occupancy can be held either as a house owner or as a tenant. For a house owner, tenure security is infinite unless it is altered by exceptional situations. For a tenant, not having the money to pay for the rents can cut the tenure security short. Therefore, questions under this item covered both housing ownership, cost of renting an accommodation, and the respondent's ability to afford the rent.

Among the 354 households, 198 (56%) are tenants while 156 (44%) are owners (fig 30).

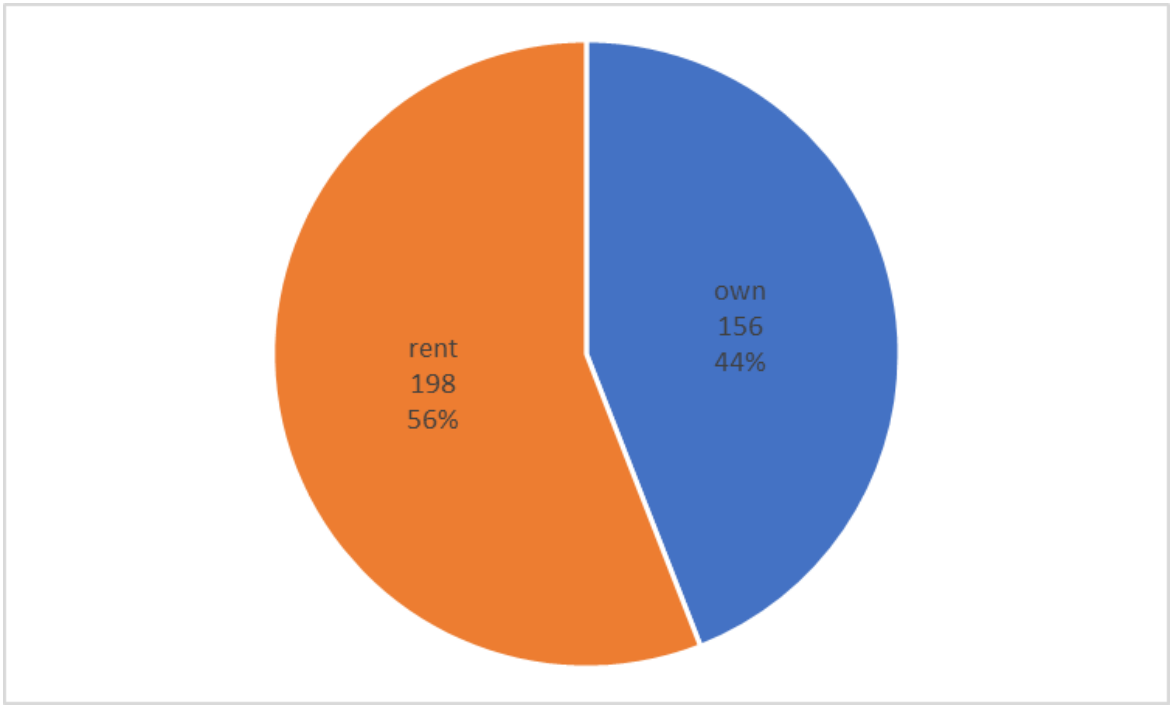

Figure 31: number of households that that own their dwellings vs those that rent (Author, 2023)

Further questions were asked to determine how affordable the housings are to either those who own or those who rent. For those who own their dwelling, the questionnaire investigated how they acquired it. This was to know which strategies help homeowners most to acquire their properties. On the other hand, for those who rent their dwellings, the questionnaire wanted to find out how much they pay for their rents, how much they can afford if they were to rent a specific size of dwelling (3-bedroom bungalow). 3-bedroom bungalow was used as a standard here because it has been the most widely used configuration for design of a single-family (family of 5) housing unit in Nigeria. Also, one year rent value was applied because rents are paid per annum in Nigeria rather than monthly, weekly, or daily.

Among those who own their dwellings (fig 32):

1. 66 households bought already built houses.
2. 56 households bought undeveloped parcel and built.
3. 34 households bought uncompleted building and finished it.
4. 0 households got houses through inheritance, lottery, and gift.

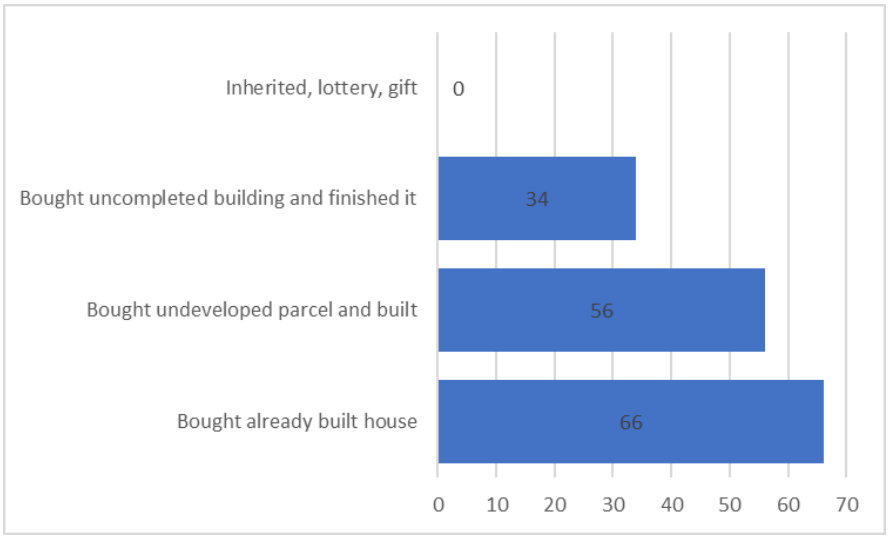

Figure 32: strategies for making housing affordable in Enugu (Author, 2023)

For those who are tenants in their dwellings:

1. 2 household pays above 700 thousand as rent per annum.
2. 1 household is living rent-free.
3. 1 household pays 601 – 700 thousand naira per annum.
4. 4 households pay 501 – 600 thousand naira as rent per annum.

5. 54 households pay 401 – 500 thousand naira as rent per annum.
6. 136 households pay 300 – 400 thousand naira as rent per annum.

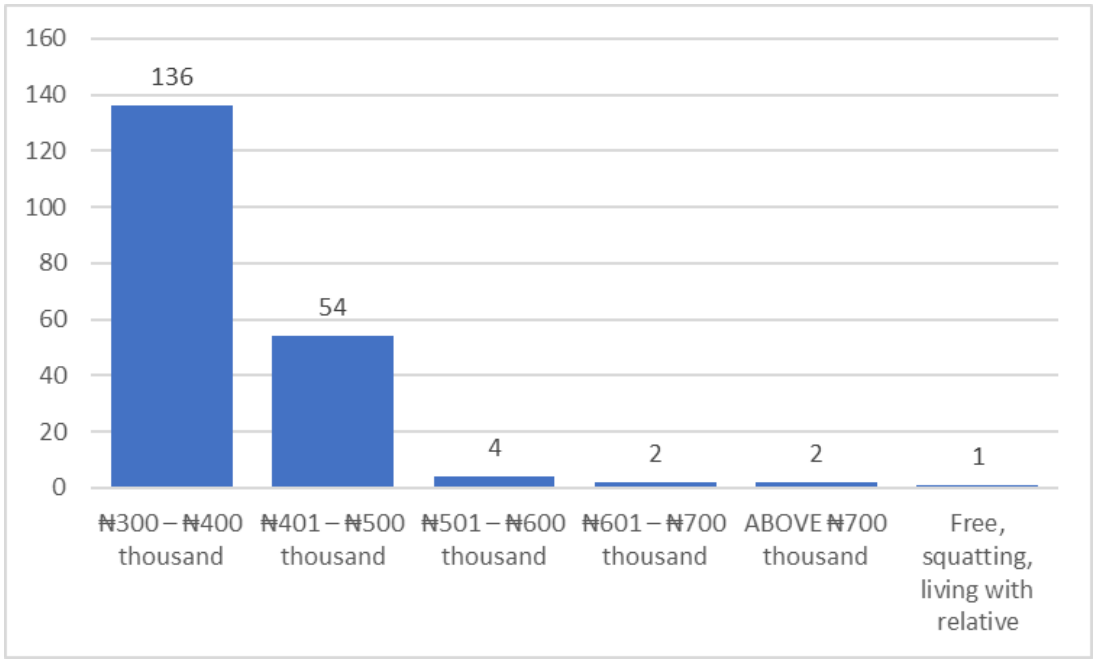

Figure 33: Cost of rents in study area of Enugu (Author, 2023)

Irrespective of the size of the accommodation, the above question inquired about the costs of rents that households pay in the study area. A further question seeked to know how much rents people are willing to pay per annum for a 3-bedroom bungalow. Thus (fig 34):

1. 1% (2 household) can afford 700 thousand naira – above as rent for 3-bedroom bungalow.
2. 20% (40 households) can afford 401 – 500 thousand naira as rent for 3-bedroom bungalow.
3. 79% (154 households) can afford 300 – 400 thousand naira as rent for 3-bedroom bungalow.
4. 0% (0 households) can afford 501 – 600 thousand naira.
5. 0% (0 households) can afford 601 – 700 thousand naira.

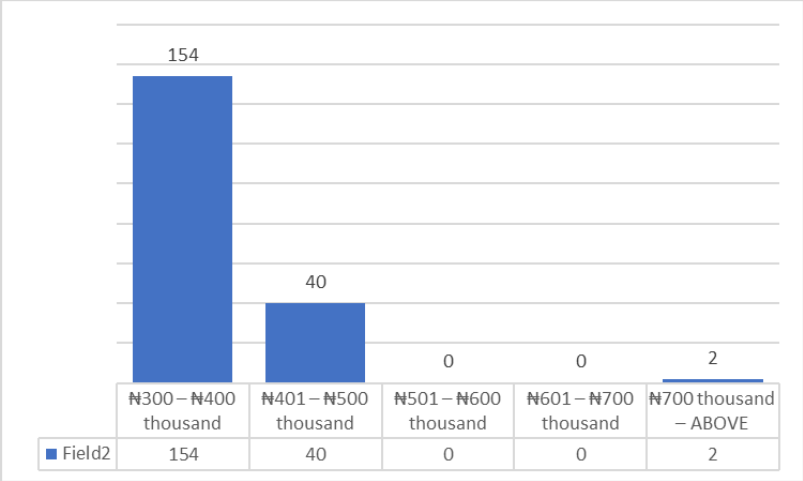

Figure 34: Households' willingness to pay for the rent of a 3-bedroom bungalow per annum in Enugu (Author, 2023)

Further question was asked to find out how much rent the tenants are willing to pay (outright purchase or instalments) to buy a 3-bedroom bungalow if they were offered the opportunity to own a home within their present incomes.

1. 192 households (80%) are willing to buy at 15 – 20 million naira.
2. 40 households (17%) are willing to buy at 21 – 25 million naira.
3. 2 household (1%) is willing to buy at 25 – 30 million naira.
4. 0 household (0%) is willing to buy above 30 million naira.
5. 4 households (2%) cannot afford any of the above

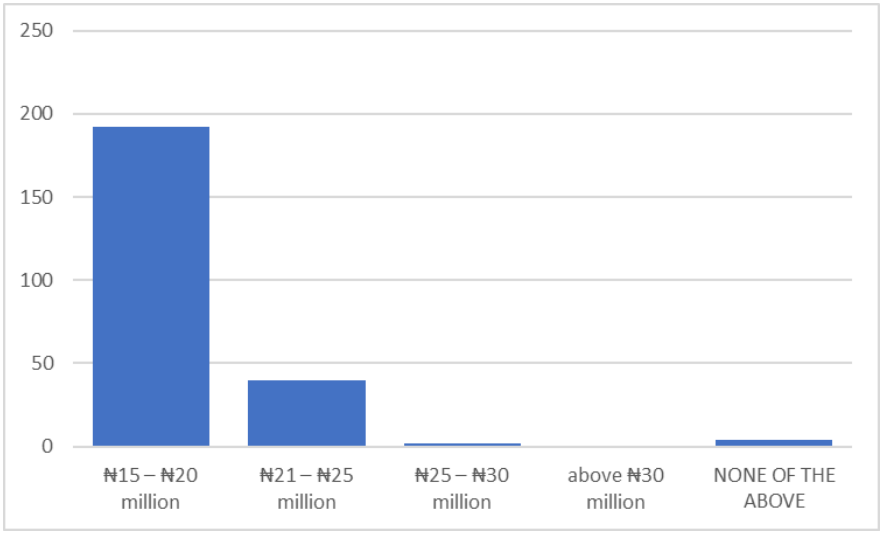

Figure 35: households' willingness to buy a 3-bedroom bungalow at a certain cost (Author, 2023)

In summary, responses from the occupants suggest two things:

1. There seems to be high housing tenure insecurity, and
2. The so-called low-income housing seems unaffordable to the low-income population.

5.3.4 Sufficient living space

In discussing sufficient living space in the context of housing, both the interior and the exterior spaces need to be considered. The interior space in this research context refers to the single housing unit occupied by a household while the exterior space refers to the surroundings of the housing including the ancillary facilities. In either case (whether interior or exterior), the space is discussed in terms of human-space relationship to know how adequate the space is to the users.

Thus, for the interior space (single housing unit), data on the number of bedrooms a household has were collected. The emphasis on "bedrooms" here is that residential housings in Nigeria are judged by the number of bedrooms not by the absolute number of rooms in the house. Also, the square meter (area) of the space is not as important as the number of bedrooms for Nigerian tenants. Furthermore, data on the number of people living in the single housing unit were collected to know if the space was enough for them or not. On the other hand, for the exterior space, data on the availability of open utility spaces were collected. They include green cover and recreational spaces.

Fig 36 shows the data on the number of bedrooms in the study area. The data shows that:

a. 12 (3%) households live in 1 bedroom apartment
b. 76 (21%) households live in 1 room apartment
c. 140 (40%) households live in 2-bedroom apartment
d. 126 (36%) households live in 3-bedroom and above

For clarity, there is a difference between 1 room apartment and 1 bedroom apartment:

- 1 room apartment is a housing unit of just a room space without any other additional spaces to the unit.
- 1 bedroom apartment is a housing unit which has just 1 bedroom but has other functional spaces within the unit. Functional spaces include but not limited to living room, kitchen, bathroom, toilet, balcony, etc.

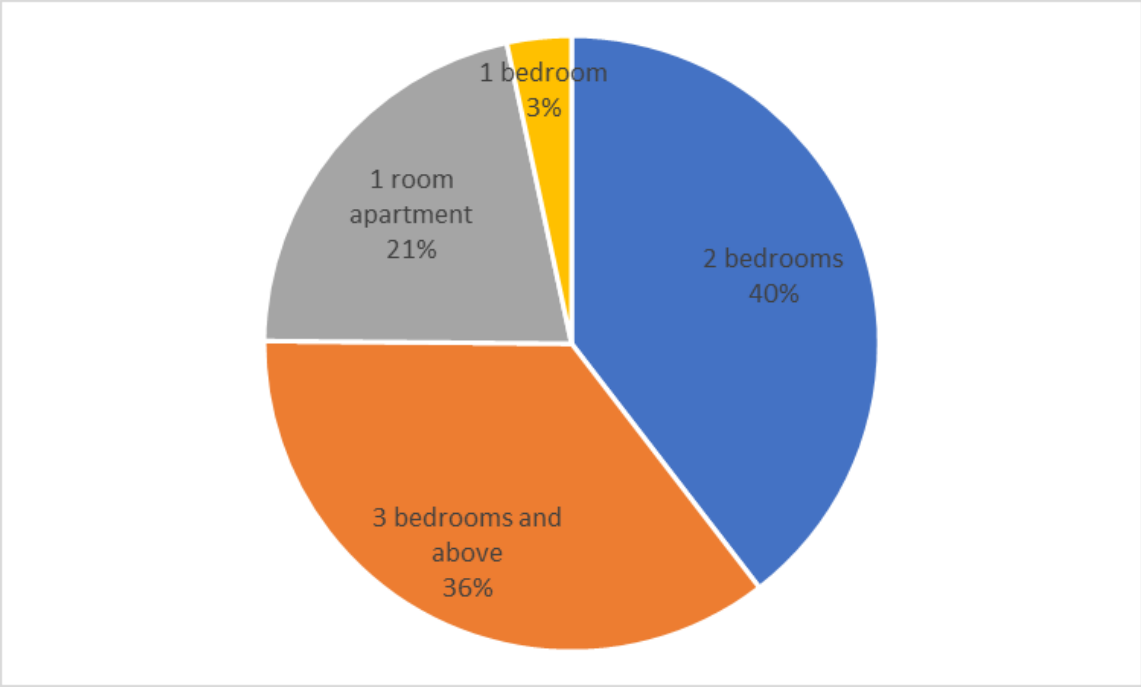

Figure 36: number of bedrooms in housing estates within Enugu urban (Author, 2023)

Furthermore, fig 37 shows the number of people living in a single housing unit in the study area. The category used to evaluate the ratio of people per interior space was according to Un-Habitat (2006) on the attributes of slum. One of the attributes suggests that a place is a slum if more than 3 people live in one room. Thus, the family sizes were checked in three categories: (i) one category was 1-3 persons in a room; (ii) the other was 4-6 persons, (ii) while the other was 6 persons and above. One of the reasons for using number ranges instead of specific numbers is that people are unlikely to tell you the exact family size in household enumeration because of their distrust on the stated purpose of the data collection. From the cultural dimension, the Igbos quantify humans using indefinite quantities (such as “many”, “several”, “innumerable”, etc.) rather than in specific headcounts. Sequel to this culture, people find it uncomfortable to mention their exact family size.

From the collected data, 0 (0%) household has 1-3 persons living in them, 242 (69%) households each has 4-6 people living them while 108 (31%) households each has above 6 persons living in them.

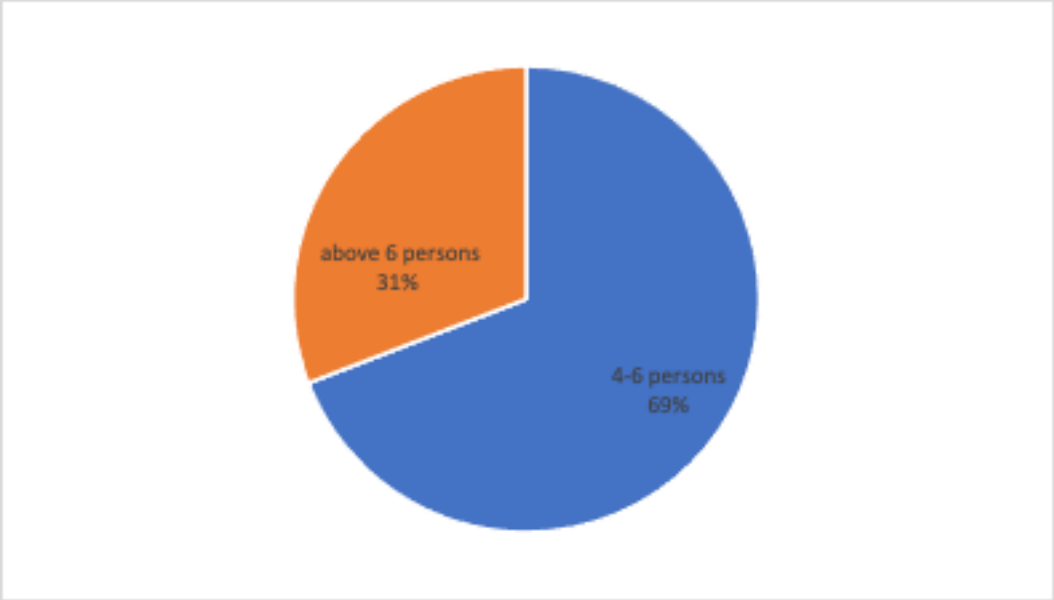

Figure 37: household size in the study area (Author, 2023)

To ascertain if the study area has sufficient eternal space, data on availability of sufficient open space for recreation activities and playground were collected in each estate visited. This type of question was relative to the individual perceptions of respective respondents. From the data collected:

- 222 (63%) households said “NO” that there are no open spaces recreation and playground
- 132 (37%) households said “YES” that there are open spaces for recreation and playground

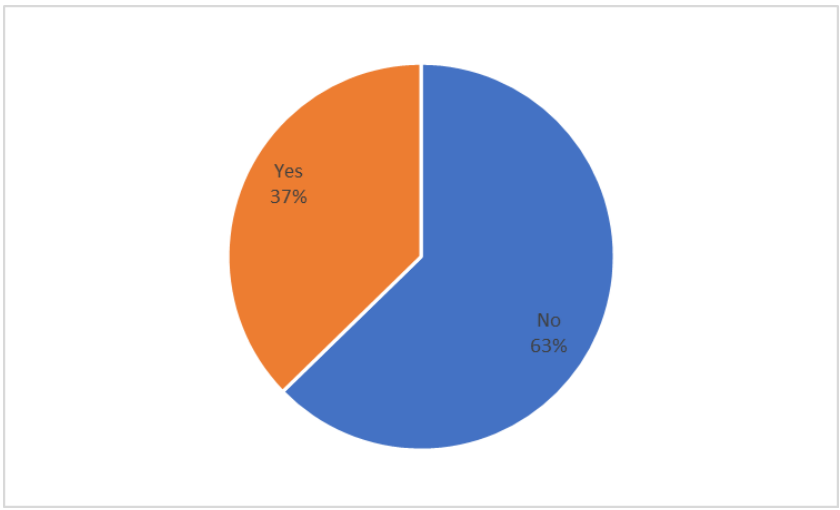

Figure 38: availability of open spaces and open spaces for recreation centers and playgrounds (Author, 2023)

Additional to the availability of open spaces for recreation or playgrounds, data on the availability of green areas for outdoor relaxation in the estates were collected. This question was necessary because in some estates, the open green areas by the proposed master plan were later built up with structures. Some of the estates seem to have been designed without considerations for the green areas at all. From the collected data:

- 226 (64%) households said “NO” that there are no green areas for relaxation
- 128 (36%) households said “YES” that there are green areas for relaxation

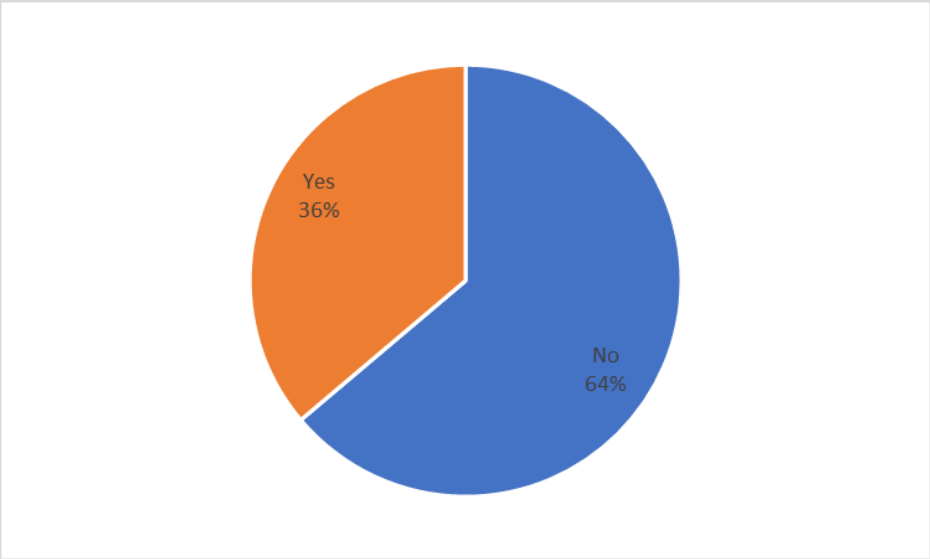

Figure 39: availability of green areas for outdoor relaxation in the study area (Author, 2023)

In summary, there seem to be sufficient internal living spaces but there are no sufficient external living spaces in the surveyed households.

5.3.5 Access to adequate sanitation

Under this attribute, questions about access to adequate sanitation covered issues on cleaning of sewage channels; who cleans the sewage; and whose responsibility it is to clean the sewage ideally. As decently build estates, they have in them modern toilets and other basic sanitary utilities. Thus, the questions were not focusing on whether a household has a toilet. Furthermore, most people are unlikely to discuss issues concerning their toilets with a stranger. Culturally, anything pertaining to feces and human excretes is treated with repugnance and can be referred to as graphic. Therefore, anything associated with feces is found indecent. A good example is that in Igbo culture, the left hand is dedicated to cleaning after defecation while the right hand is dedicated to eating food. Thus, giving items to an Igbo person using the left hand is found disrespectful because of its association with feces and other negatives. Therefore,

instead of probing into the conditions of their toilets and bathrooms which most people would not be willing to discuss, the questions were limited to the sewage and drainage systems in the estates which many people can freely discuss.

The first question was to know whether occupants clean the sewages by themselves or not. Data collected show that:

- 188 (53%) households said “Yes” that they clean the sewage themselves
- 166 (47%) households said “No” that they do not clean the sewage themselves

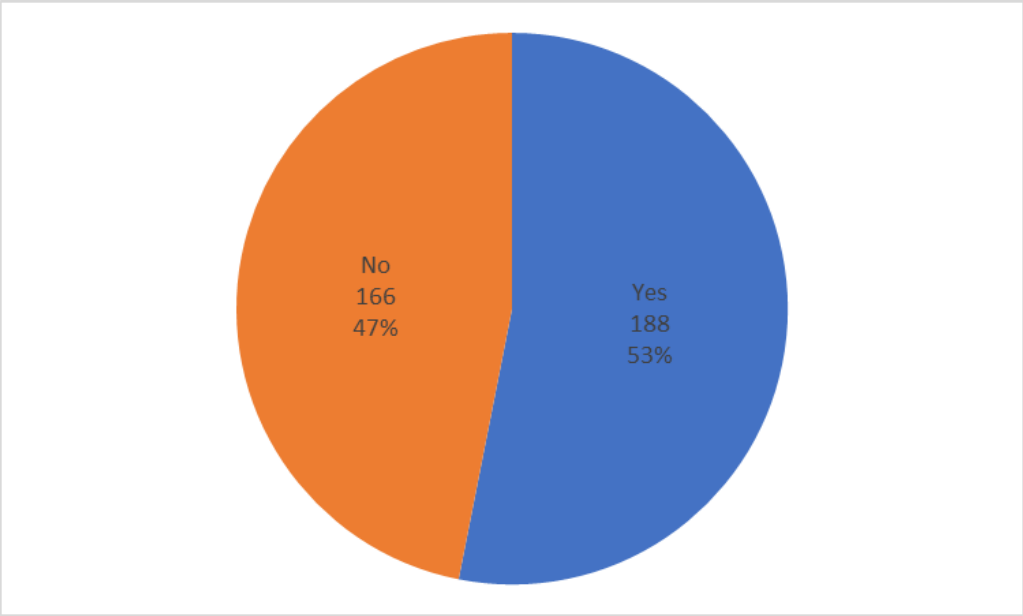

Figure 40: those who clean their sewages themselves vs those who do not (Author, 2023)

For those who clean their sewages themselves, the inference is that there is maintenance to their sewage. However, for those who do not clean the sewage themselves, further questions were asked to know who they think should take care of it. Answers from this question would clarify the extent of maintenance to the sewage and whether it was a case of negligence by the people responsible. Collected data showed that:

- 85 (42%) households think it is the duty of a government agency
- 69 (34%) households think it is the duty of the landlord/lady
- 41 (21%) households think it is the duty of the occupants (self)
- 5 (3%) households think it is none of the above but some other ways of cleaning the sewage

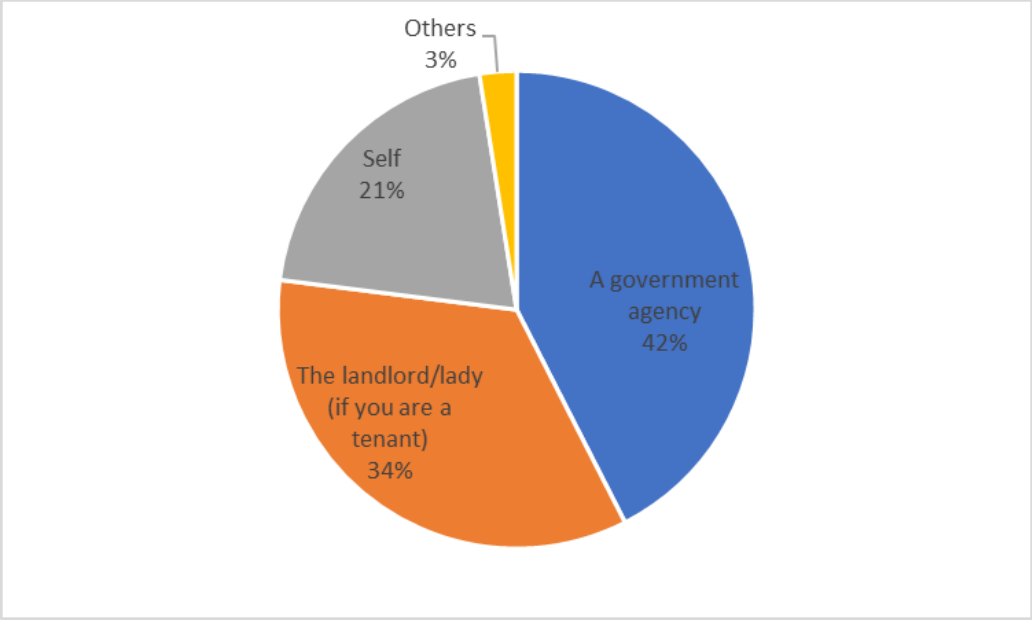

Figure 41: occupants' opinions on who should clean the sewage (Author, 2023)

Further on the access to adequate sanitation, data on availability of functional drainage channels in the estates (gutter) were collected. Using the synonym, "gutter" was deliberate because most Nigerians use the term, "gutter" more often than they use the term, "drainage". The term, "drainage" seems exclusively more academic than general in the Nigerian parlance. Collected data show that:

- 180 (51%) households said "YES" that there are drainage channels in their estates
- 174 (49%) households said "NO" that there are no drainage channels in their estates

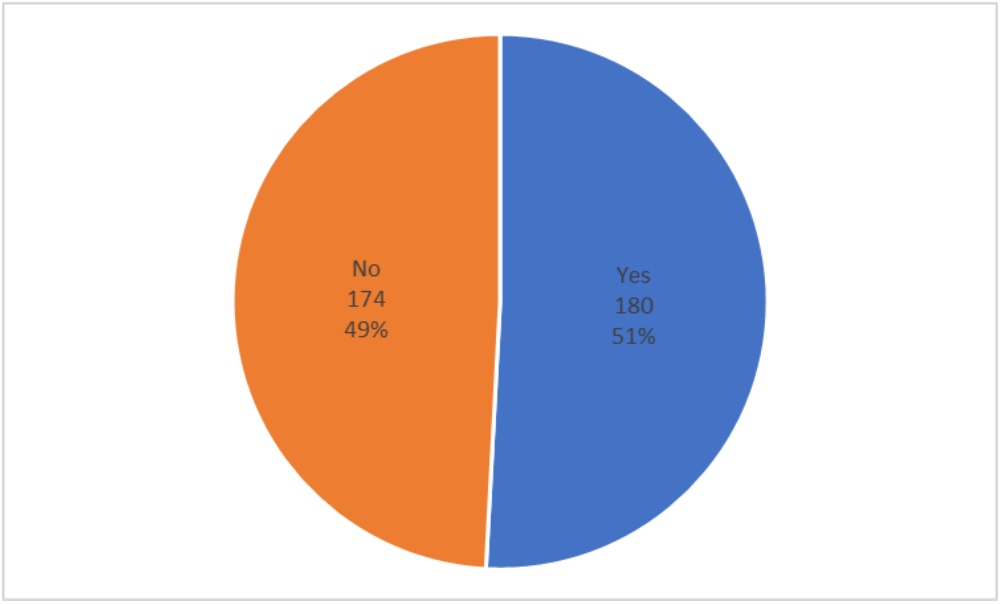

Figure 42: availability of drainage channels in the estates (Author, 2023)

For those who do not have functional drainage channels in their estates, further data were collected on why there were non-functional drainages. There are a range of reasons for the absence of functional drainage channels based on the collected data:

- 106 (61%) households said that drainage channels were not in the original designs of their estates
- 54 (31%) households said that drainage channels were constructed but damaged
- 10 (6%) households said that drainage channels were constructed but are blocked with wastes and other unauthorized structures
- 4 (2%) households do not know why. Hence, there are other reasons for absence of functional drainage channels in their estates.

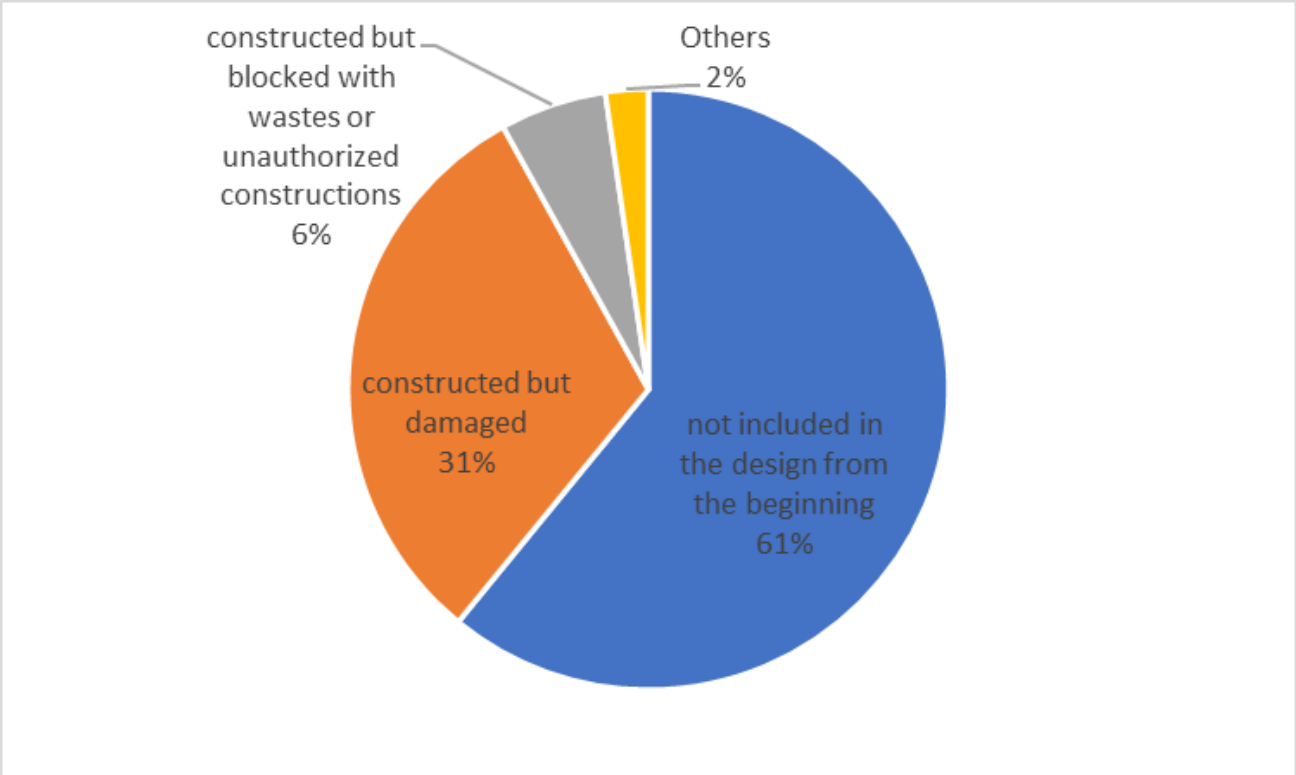

Figure 43: why some estates do not have functional drainage channels (Author, 2023)

In summary, about a half of the estates surveyed seem to have both inadequate sanitation and non-functional drainages. Therefore, there seems to be insufficient sanitation in the study area.

5.3.6 Easy/sufficient access to services

Easy and sufficient access to services investigated the presence or absence facilities that help a dwelling to function both externally and internally. Internal services include water, electricity, telecommunication, and other utilities attached to a housing unit which the occupants can use exclusively from other occupants. External services include hospitals/clinics, schools, churches, shopping centers, access roads and other facilities which are outside of the housing unit and are jointly used by other occupants which help individual housing units to be livable.

For internal services, questions focused on access to water supply only but did not address electricity or telecommunication. While all are important, water is the most important of them and is indispensable for human existence. On the other hand, electricity is a national issue of which its supply nationally is problematic. Thus, the challenge an estate faces on electricity might be the same as the challenge other neighborhoods face.

On access to water supply, connection to central water supply was the only measure of access to safe water. Data collected shows the following:

- 238 (67%) households said "NO" that they are not connected to the central water supply
- 116 (33%) households said "YES" that they are connected to the central water supply

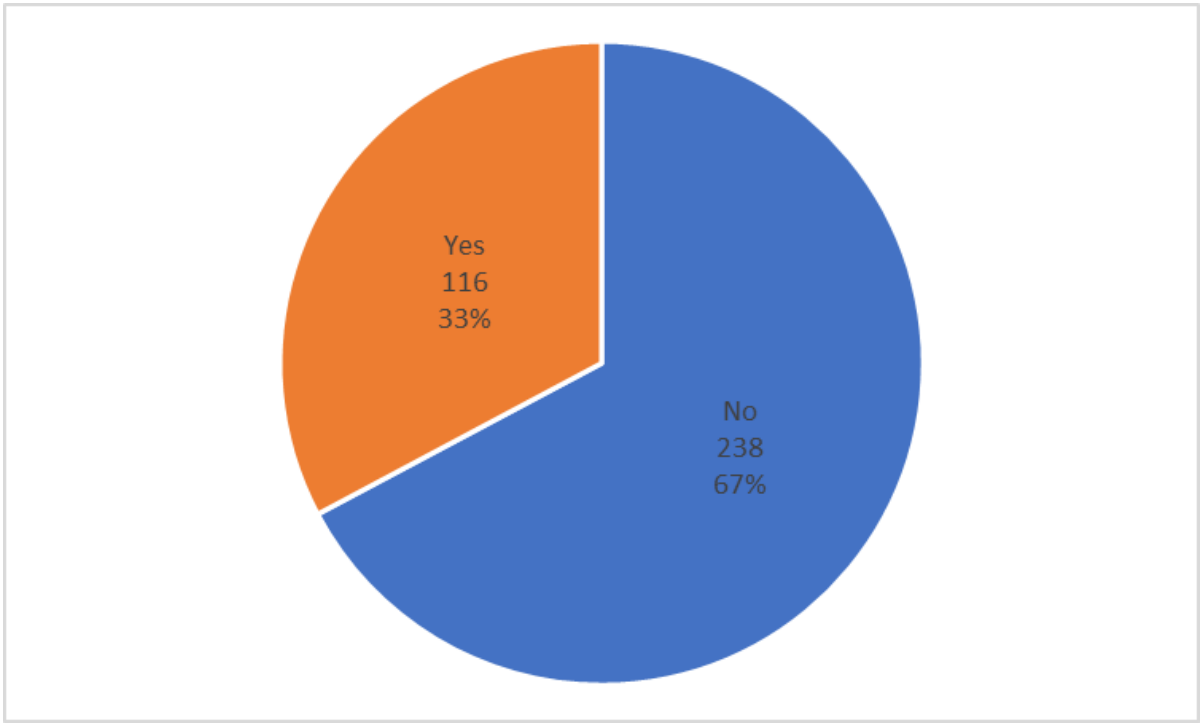

Figure 44: households that are connected to the central water supply (Author, 2023)

For those who said “YES”, their access to water is guaranteed if central water supply is operational. For those who said “NO”, they have additional challenges. Therefore, further questions were asked to know where the residents get their water from:

- 136 (55%) households source their water from well/boreholes
- 94 (38%) households source their water from tankers/truckers
- 12 (5%) households source their water from mobile water vendors
- 4 (2%) households source their water from other unnamed sources

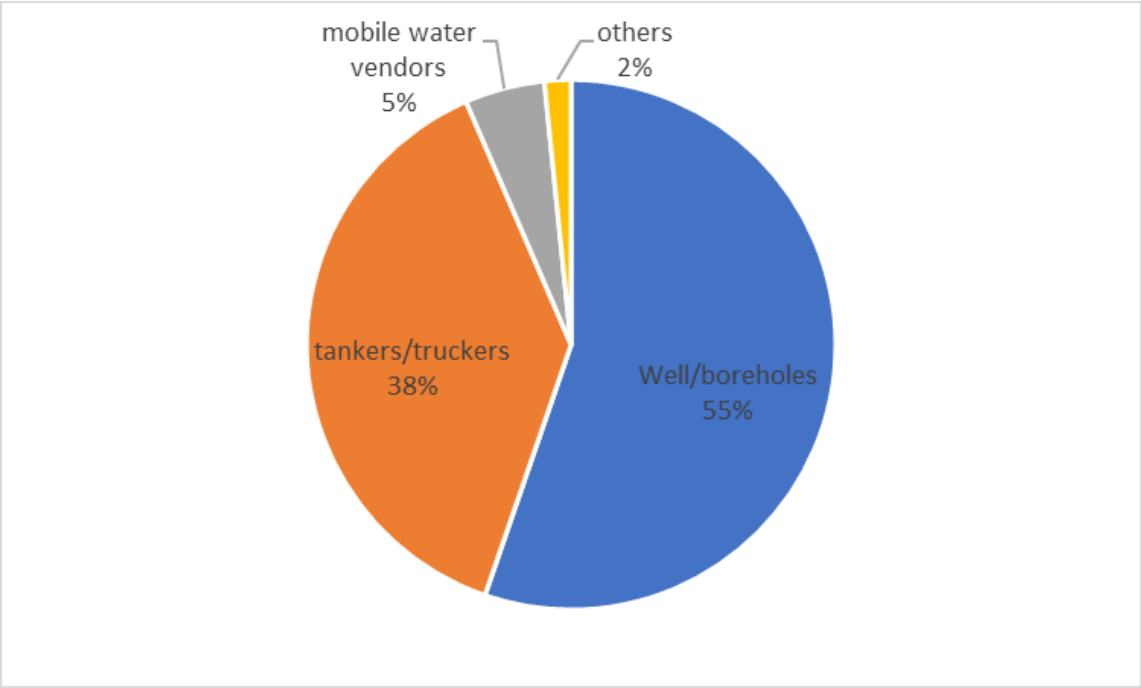

Figure 45: other sources of water supply to the estates who that not connected to the central water supply (Author, 2023)

For external services, questions covered only road transportation as this is the only means of intra-urban transportation. Questions further covered access to schools, markets, and internet services.

Data on households’ distances away from hospitals/health centers/clinics were collected. Instead of measuring these distances in terms of metric scales (kilometers/miles), the travel time was used because travels in Nigeria are measured in terms of how much time the journey takes. This could be due to other factors including traffic jams and road conditions which can slow down movements, and social perceptions of measurements.

- 210 (59%) households are far by 11 – 30 minutes' drive by car
- 92 (31%) households are far by 31 minutes – 1 hour drive by car
- 52 (15%) households are far by less than 10 minutes by car or walking distances

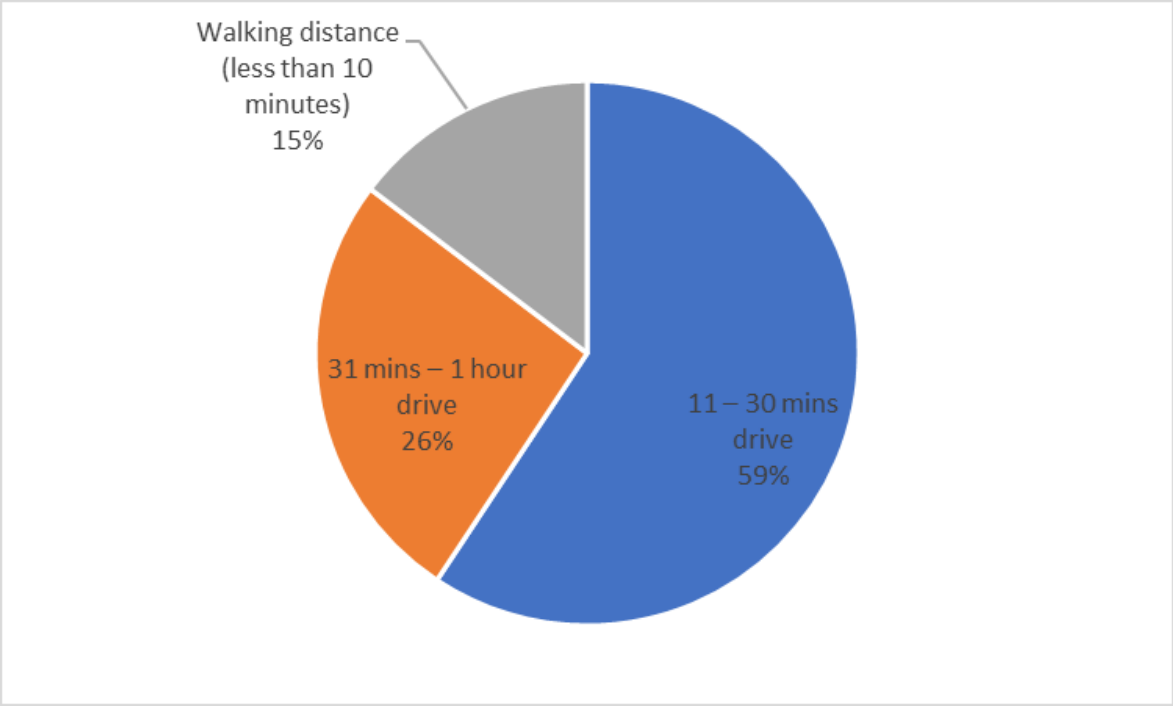

Figure 46: distances of households from hospitals/health centers/clinics (Author, 2023)

Data on the distances from nursery/primary schools were collected but did not include secondary (high schools) and tertiary. This is because by planning, secondary schools and tertiary schools are not part of the Universal Basic Education (UBE) programs which must be accessed by all. Therefore, it will not be effective to have many secondary and tertiary schools at shorter distances from homes. From the collected data:

- 166 (47%) households are far by 11 – 30 minutes' drive by car
- 124 (35%) households are far by 31 minutes to 1 hour drive by car
- 56 (16%) households are far by less than 10 minutes' drive or walking distance
- 8 (2%) households are far by 1 hour and above by car

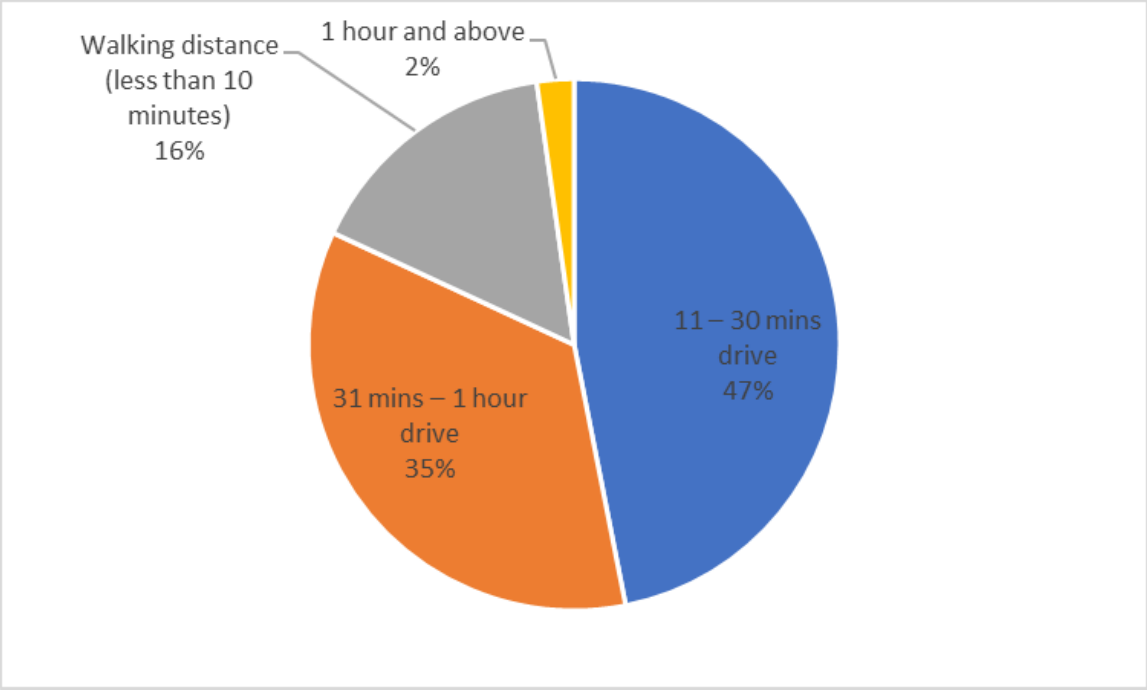

Figure 47: distances of households from nursery/primary schools (Author, 2023)

For distances from markets and shopping centers:

- 168 (47%) households are far by 11 – 30 minutes' drive by car
- 146 (41%) households are far by 31 minutes – 1 hour drive by car
- 34 (10%) households are far by less than 10 minutes by car or walking distances
- 6 (2%) households are far by 1 hour and above by car

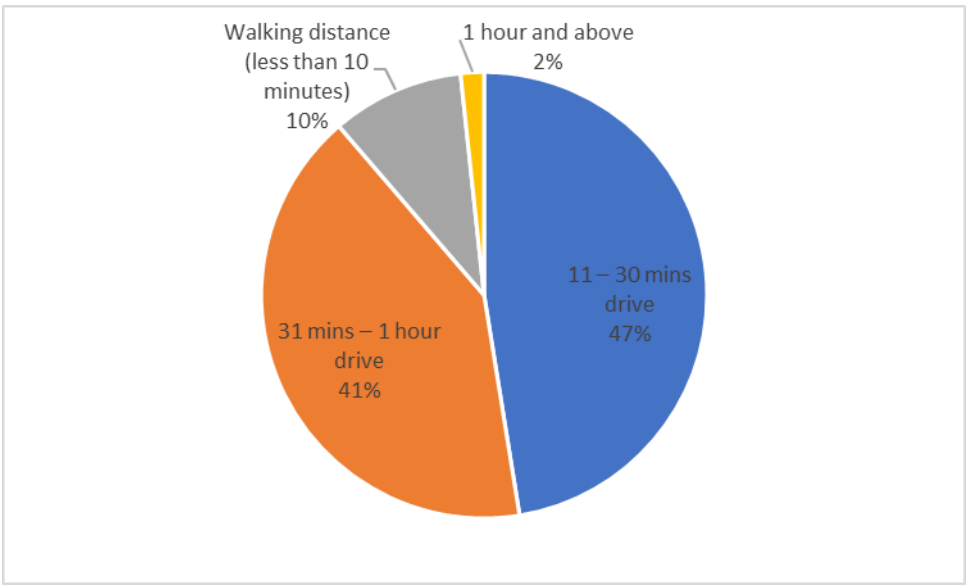

Figure 48: distances of households from markets and shopping centers (Author, 2023)

With rising need for internet connectivity, some developers are recommending inclusion of internet services in their housing schemes. Data were also collected on the sources of internet connection for the occupants:

- 42 (12%) households use free public Wi-Fi
- 304 (86%) households buy data bundles
- 8 (2%) households use free data from telecoms
- 0 (0%) households get internet from their estate management
- 1 (1%) household use other unnamed sources of internet supply

Answers	**respondents**	**Percentage respondents**
Free Public Wi-Fi	42	12%
buy data bundles	304	86%
free data from telecoms	8	2%
free/paid data from estate management	0	0%
others	1	1%

Table 12: different sources of internet connection in the estates (Author, 2023)

The road plays a vital role in the transportation, commute, and movement of people. Data collected shows that:

- 88 (25%) estates have Tared/paved road (narrow-damaged)
- 80 (22%) estates have Earth Road (narrow)
- 70 (20%) estates have Earth Road (wide)
- 52 (15%) estates have Tared/paved road (narrow-good)
- 46 (13%) estates have Tared/paved road (wide-good)
- 18 (5%) estates have Tared/paved road (wide-damaged)

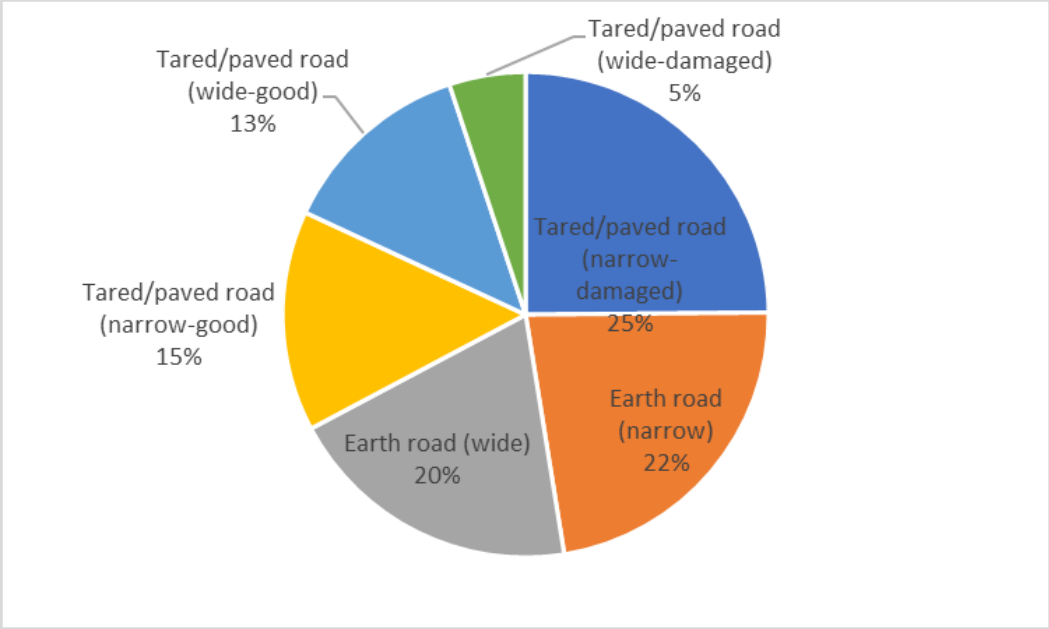

Figure 49: different conditions of road in the estates (Author, 2023)

Also, data on the repair of the roads in the estates were collected. According to the data collected:

- 328 (93%) households in the estates said “NO” that there is no routine repair of roads
- 26 (7%) households in the estates said “NO” that there is routine repair of roads

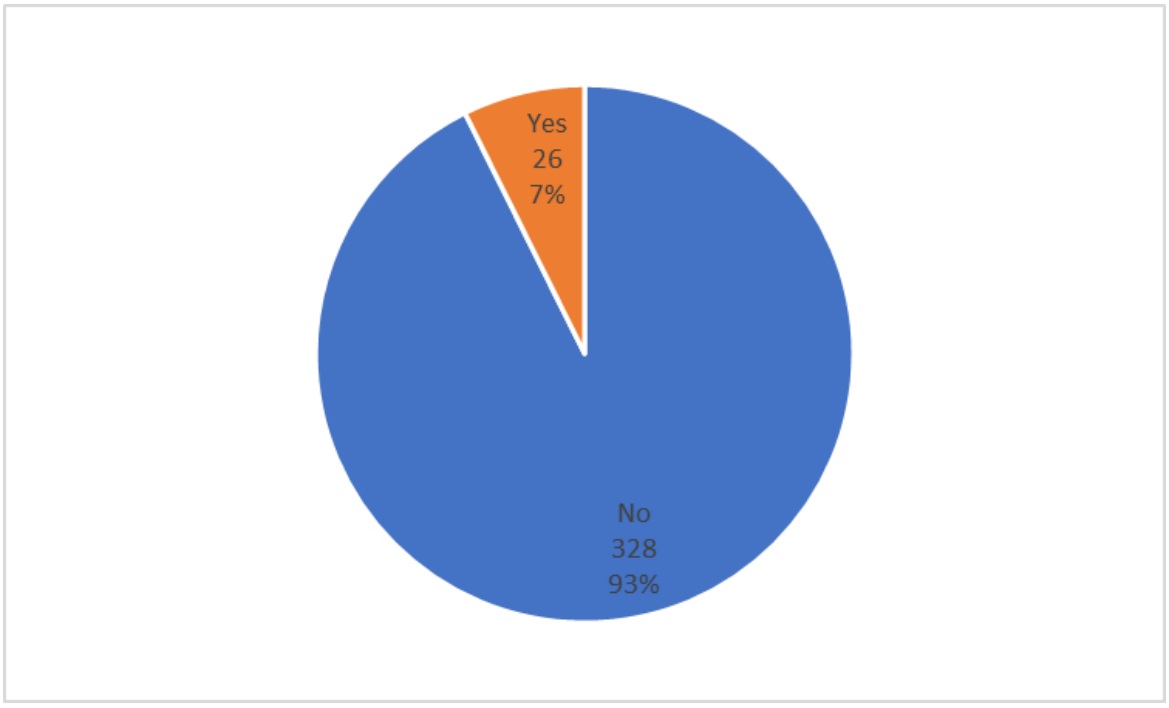

Figure 50: routine repair of roads in the estate (Author, 2023)

In summary, one can infer thus:

1. That most neighbourhoods are fairly located near hospitals/clinics, schools, and shopping centres.
2. That most of the occupants do not have guaranteed access to clean water because only the water from the central supply has verifiable high quality and good hygiene.
3. That most of the roads in the estates are damaged and bad for driving.
4. Individuals provide themselves with internet services and not by the estate managements.

5.3.7 Durable Housing of Permanent Nature

Absence of housing built with long-lasting materials may qualify a place as a slum. Hence, data were collected on the goodness or damages on the housing units within the estates that were surveyed. A test of durability of a material was to check the extent and nature of breakdown over period of use. Therefore, data were collected on the damages to the housing units. Further data were also collected on the repairs and whose responsibility it is to repair damages to housing units.

There are different categories of damages to the housing units. While a list of some damages was given, there was a provision for the respondents to indicate “others” that were not covered in the list. The “others” gives the respondents a chance to include some of those things they might not be comfortable naming. Some of them, as indicated in the data on access to sanitation, include WC/bathroom, kitchen, etc. Collected data indicates that:

- 76 (21%) households have cracked wall
- 159 (45%) households have leaking/damaged roof
- 4 (1%) households have broken/no windows
- 0 (0%) households have broken/no doors
- 0 (0%) households have Fire burnt but not renovated
- 117 (33%) have other unnamed damages

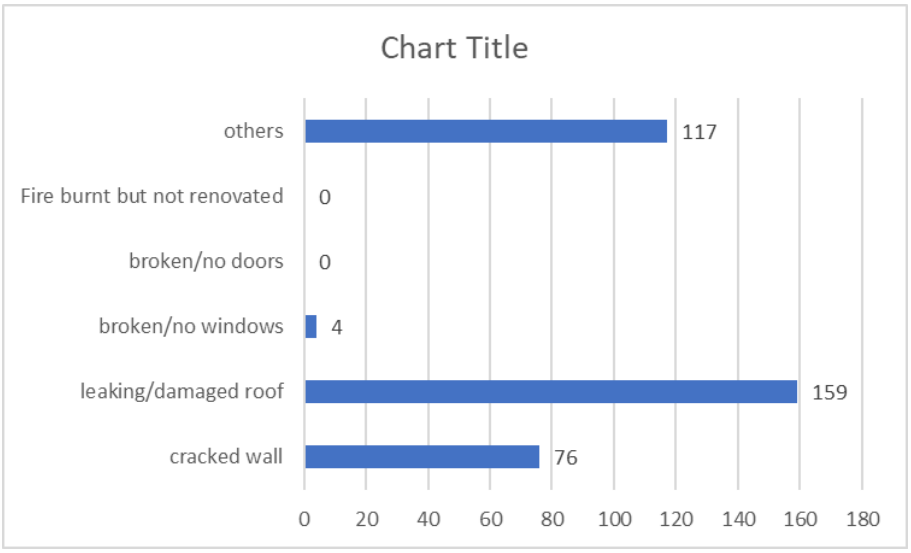

Figure 51: different damages to the housing units in the estates (Author, 2023)

Data on how long it takes to repair damages to housing units were collected:

- 166 ((62%) households get their repairs in 8 days and above
- 76 (28%) households are never repaired
- 14 (5%) households repair in 0 – 7 days
- 12 (5%) households repair and receive refund from house owners

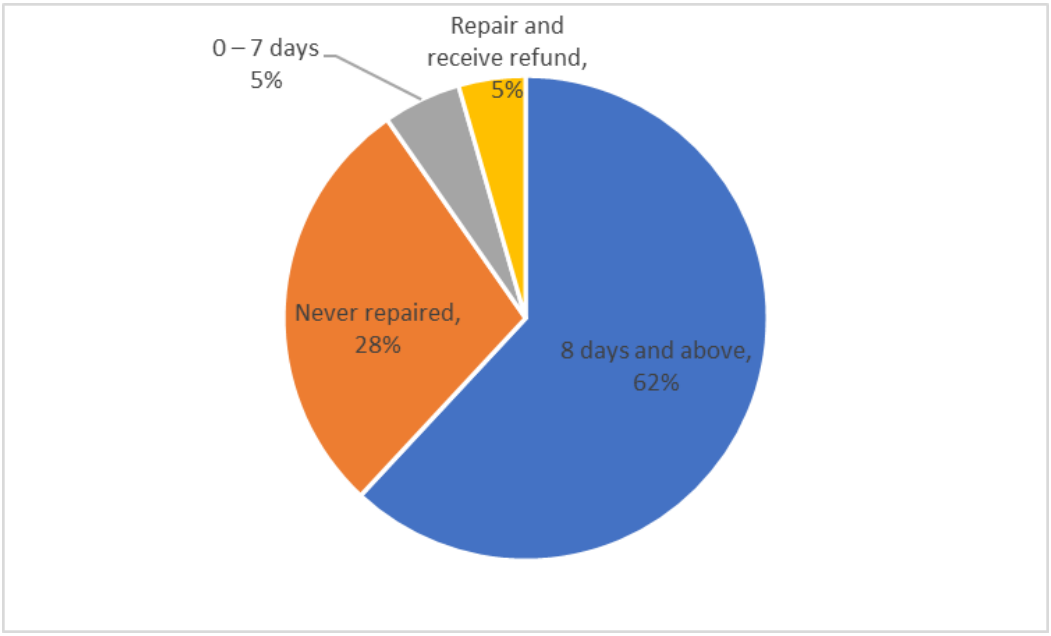

Figure 52: how long it takes to repair damages to the housing units in the estates (Author, 2023)

Because of the noted unrepaired damages, further data were collected on whose responsibility it is to take care of the damages:

- 162 (46%) households indicated that it is their self-responsibility (self-funded)
- 150 (42%) households indicated that it is the responsibility of the landlord/lady
- 26 (7%) households indicated that they repair and receive refund from the house owner
- 16 (5%) households indicated that it is the responsibility of a government agency

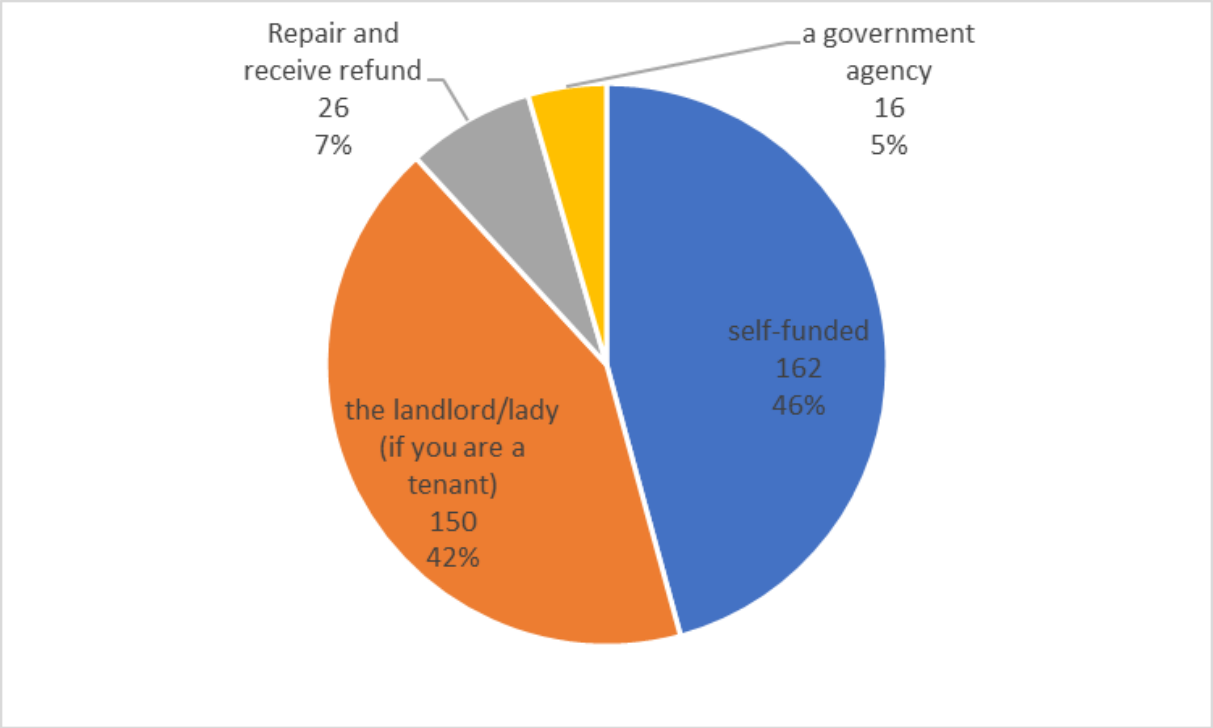

Figure 53: parties responsible for repairing damages in the housing units in the estates (Author, 2023)

In summary, there is also a possibility that the surveyed estates are not maintained at all or poorly maintained.

5.3.8 Synopsis of the non-expert views

The data collected from the non-expert respondents seem to suggest that the surveyed households conform to the characteristics of slum. However, to verify this suspicion, further analysis was done as presented in chapter 6.

Chapter 6: Data Analysis and Interpretation

6.1 Introduction

Data are like building blocks that, when grouped into patterns, become information, which in turn, when applied or used, becomes knowledge (Bloomberg & Volpe, 2012). Based on chapter 5, primary data were collected from two sources – one source was through semi-structured expert interviews and the other was through structured surveys. Chapter 5 reported both the findings of the expert interviews and the structured survey. It further discussed the findings of the expert interviews and those of the structured survey to draw some preliminary inferences.

This chapter (chapter 6) expands further on the findings of the structured survey by analyzing them to extract the critical issues that require more urgent attention. Further interpretation of those identified critical issues was done to unpack their meanings. Knowledge gathered from those interpretation could be applied in creating appropriate policy recommendations to improve the housing conditions in the study area and beyond.

Survey data were analyzed using IBM-SPSS. Original photos were also taken from the field to buttress some data interpretations. There are other data analyses tools which can perform similar tasks as IBM-SPSS. However, IBM-SPSS was chosen because of the following:

1. IBM-SPSS has a free access license (limited period), and it is easy to operate.
2. Existing excel file can be imported into the IBM-SPSS ecosystem without distortion.
3. Excel requires more processes of setting the commands using formulae. However, those formulae are already in IBM-SPSS as mere click commands.
4. There is high risk of error in excel because the excel file is editable and inputs can easily be altered by mistake without the analyst noticing it.

To measure impacts among variables in IBM-SPSS, one can assess the correlations (connections) or regressions (predictions) among data. In this research context, regressions could not be computed. Hence, this analysis was based on correlations only. Secondly, instead of picking pairs of data purposively to analyze, a correlation matrix of all the 25 variables was generated (see table 14).

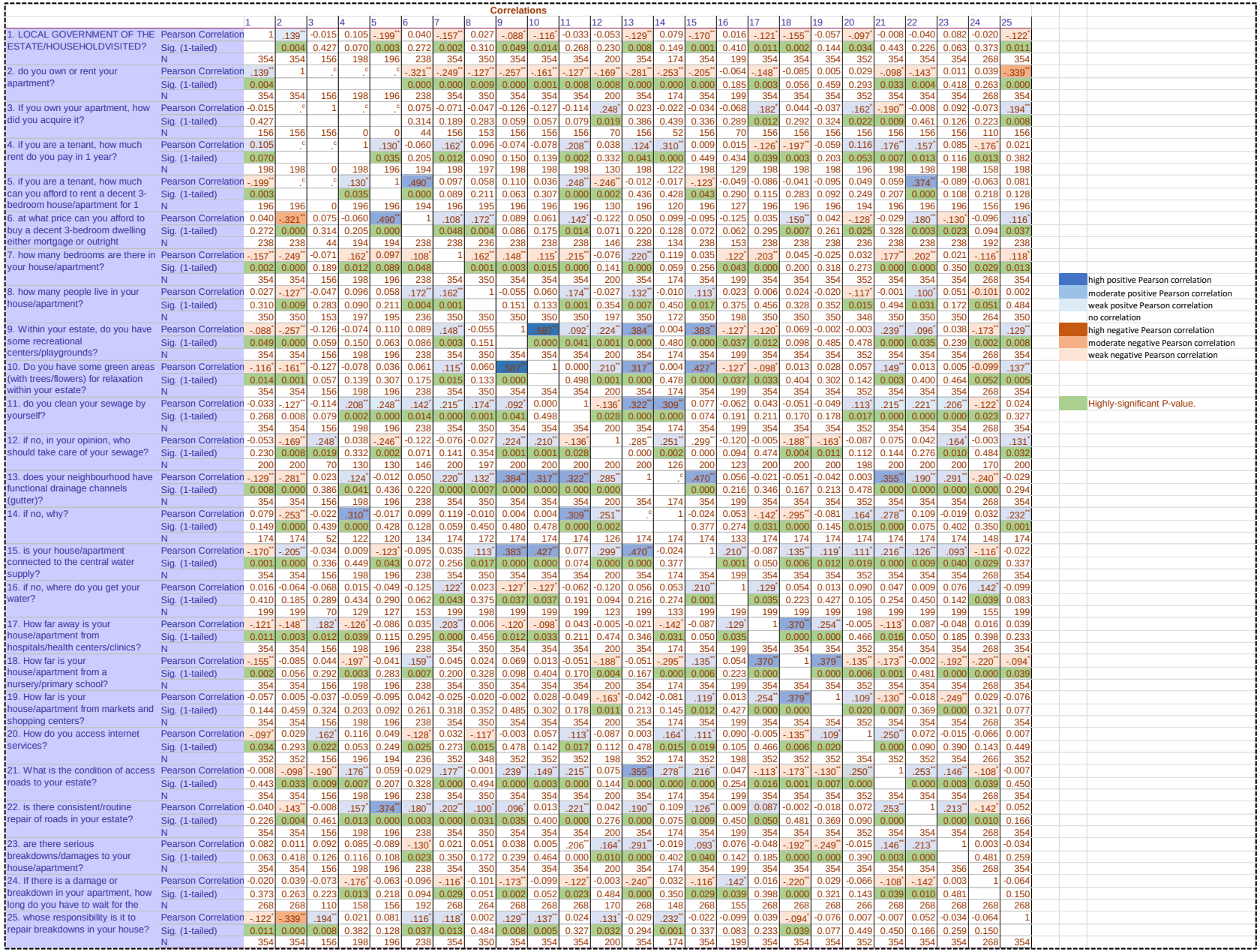

Table 13: correlation matrix of all the variables (1-25) using IBM-SPSS (Author, 2023)

On the first column in table 13 (from the top to bottom) are the set of questions (variables) written in the order they were asked on the questionnaire (from number 1 – 25). Also, on the first row (from the left to the right) are the same set of questions (variables) written in the order they were asked on the questionnaire. However, for print convenience, questions along the row were written as numbers only (1-25) while the questions along the column were written in full.

The second column (from the left to the right) sub-divides each variable into three parameters of results (r = Pearson correlation coefficient/correlation coefficient, sig./p-value = significance, and N = sample size). "A correlation coefficient is a statistical measure of the degree to which changes to the value of one variable predict change to the value of another. In positively correlated variables, the value increases or decreases in tandem. In negatively correlated variables, the value of one increases as the value of the other decreases" (Wigmore, 2020). "Correlation coefficients are expressed as values between +1 and -1. A coefficient of +1 indicates a perfect positive correlation: A change in the value of one variable will predict a change in the same direction in the second variable. A coefficient of -1 indicates a perfect negative correlation: A change in the value of one variable predicts a change in the opposite direction in the second variable. Lesser degrees of correlation are expressed as non-zero decimals. A coefficient of zero indicates there is no discernable relationship between fluctuations of the variables" (Wigmore, 2020). Table 14 further summarizes the scaler groupings of various strengths of correlation (r).

Value of r	**Strength of relationship**
-1.0 to -0.5 or 1.0 to 0.5	Strong
-0.5 to -0.3 or 0.3 to 0.5	Moderate
-0.3 to -0.1 or 0.1 to 0.3	Weak
-0.1 to 0.1	None or very weak

Table 14: r- values and their various strengths of correlation according to Wilson (2009)

Additional to table 14, color codes were applied to distinguish the various strengths of correlation. Thus, negatives were separated from positives for ease of recognition.

Value of r	Strength of relationship	Color codes
1.0 to 0.5	Strong positive	
0.3 to 0.5	Moderate positive	
0.1 to 0.3	Weak positive	
-0.1 to 0.1	None or very weak	
-0.3 to -0.1	Weak negative	
-0.5 to -0.3	Moderate negative	
-1.0 to -0.5	Strong negative	

Table 15: color codes for different strengths of relationship – adapted from Wilson (2009)

For each strength of correlation coefficient (r), there is a corresponding value for its "significance level" (p-value). The "significance level" is a measure of the strength of the evidence that must be present in your "sample" before you will reject the null hypothesis and conclude that the "effect" is "statistically significant" (Frost, 2022). A null hypothesis is a type of statistical hypothesis that proposes that no statistical significance exists in a set of given observations (Hayes, 2022). Therefore, even if a correlation is strong in an observation, its statistical significance must be strong for the observation to be accepted.

"The most common threshold for a significance level is $p < 0.05$; that is, when you would expect to find a test statistic as extreme as the one calculated by your test only 5% of the time. But the threshold depends on your field of study – some fields prefer thresholds of 0.01, or even 0.001" (Bevans, 2020). This implies that if the p-value is 0.05 or lower, the result is trumpeted as significant, but if it is higher than 0.05, the result is non-significant and tends to be passed over in silence (Pripp, 2015). For this research, the significance threshold is 0.05 and were annotated with a color code (green) while the other lower significances were ignored and have no color annotation – see table 16 below. This is because the significant values are the only figures applied in the analysis.

Value of significance (p-value)	Level of significance	Color code
<0.05	Highly significant	

Table 16: color code for highly significant correlation coefficients – adapted from Wilson (2009)

Applying the color codes as illustrated above to the correlation matrix in table 16, there are 16 pairs of correlations that are highly significant. In Table 17 below, those pairs of significant correlations were listed, and preliminary interpretations of them were made.

s/n		CORRELATION		INTERPRETATIONS (Based on collected data only)
1	Q6. at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase? Q2. do you own or rent your apartment?			• 44% of the households own their residences while 56% rent theirs. • 80% of the households could only afford the lowest range of the selling price of a house (₦15 – ₦20 Million). Therefore, ownership of houses tends to decrease as the selling price of housing increases.
	Pearson Correlation	-.321**	Moderate negative correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	238		
2	Q5. if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year? Q6. at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase?			• 79% of the households can only afford the lowest range of rents. • 80% of the households can only afford the lowest range of cost of buying a house. Therefore, affordability of renting a house tends to decrease as the affordability of buying also decreases
	Pearson Correlation	.490**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	194		
3	Q10. Do you have some green areas (with trees/flowers) for relaxation within your estate? Q9. Within your estate, do you have some recreational centers/playgrounds?			• about 24% of the estates have green areas or • about 24% of the estates have recreational centres. This suggests that those who lack green areas for relaxation tend to also lack recreational centers/playgrounds.
	Pearson Correlation	.587**	High positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
4	Q13. does your neighborhood have functional drainage channels (gutter)? Q9. Within your estate, do you have some recreational centers/playgrounds?			• 24% of the respondents have access to functional drainage channels. • 24% of the respondents have access to recreational centres. Those lacking functional drainage channels tend to also lack recreational centers.
	Pearson Correlation	.384**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
5	Q13. does your neighborhood have functional drainage channels (gutter)? Q10. Do you have some green areas (with trees/flowers) for relaxation within your estate?			Those who lack access to functional drainage channels tend to also lack access to green areas for relaxation
	Pearson Correlation	.317**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		

6	Q13. does your neighborhood have functional drainage channels (gutter)? Q11. do you clean your sewage by yourself?			Those who lack access to functional drainage channels tend not to clean their sewages themselves
	Pearson Correlation	.322**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
7	Q14. if no, why? Q4. if you are a tenant, how much rent do you pay in 1 year?			Tenants who can only afford the lowest range of rents (₦300 – ₦400 thousand) seem to be those that can only afford properties in estates built without drainages in their masterplan.
	Pearson Correlation	.310**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	122		
8	Q14. if no, why? Q11. do you clean your sewage by yourself?			Majority of those who lack access to functional drainage channels because of its non-inclusion in the masterplan also tend not to clean their sewages themselves
	Pearson Correlation	.309**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	174		
9	15. is your house/apartment connected to the central water supply? Q9. Within your estate, do you have some recreational centers/playgrounds?			Those who lack access to central water supply tend to also lack recreational spaces in their estates
	Pearson Correlation	.383**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
10	Q15. is your house/apartment connected to the central water supply? Q12. if no, in your opinion, who should take care of your sewage?			• 67% of the occupants are not connected to the central water supply. • 57% of the occupants prefer other non-state agencies to clean their sewages while the other 43% prefer the government. Those who lack access to central water supply tend to prefer more of other non-state agencies to clean their sewages
	Pearson Correlation	.427**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
11	Q15. is your house/apartment connected to the central water supply? Q13. does your neighborhood have functional drainage channels (gutter)?			Those who lack access to central water supply tend to also lack access to functional drainage channels
	Pearson Correlation	.470**	Moderate positive correlation	
	Sig. (1-tailed)	0.000	Very high significance	
	N	354		
12	Q18. How far is your house/apartment from a nursery/primary school?			Those who live close to schools tend to also live close hospitals/health centers

	Q17. How far away is your house/apartment from hospitals/health centers/clinics?		
	Pearson Correlation	.370**	Moderate positive correlation
	Sig. (1-tailed)	0.000	Very high significance
	N	354	
13	Q19. How far is your house/apartment from markets and shopping centers? Q18. How far is your house/apartment from a nursery/primary school?		Those who live close shopping centers tend to also live close to schools
	Pearson Correlation	.379**	Moderate positive correlation
	Sig. (1-tailed)	0.000	Very high significance
	N	354	
14	Q21. What is the condition of access roads to your estate? Q13. does your neighborhood have functional drainage channels (gutter)?		Those who have non-functional drainage channels tend to also have bad roads
	Pearson Correlation	.355**	Moderate positive correlation
	Sig. (1-tailed)	0.000	Very high significance
	N	354	
15	Q22. is there consistent/routine repair of roads in your estate? Q5. if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year?		Those whose estate roads lack maintenance seem to be those who can only afford the lowest range of rents (₦300 – ₦400 thousand).
	Pearson Correlation	.374**	Moderate positive correlation
	Sig. (1-tailed)	0.000	Very high significance
	N	196	
16	Q25. whose responsibility is it to repair breakdowns in your house? Q2. do you own or rent your apartment?		tenants, as opposed to homeowners, tend not to repair breakdowns in their homes by themselves but rather depend on the lessor to repair the breakdowns
	Pearson Correlation	-.339**	Moderate negative correlation
	Sig. (1-tailed)	0.000	Very high significance
	N	354	

Table 17: correlations among the variables from the structured survey of households in government estates in Enugu (Author, 2023)

In the next sections (6.2 – 6.11), the above tabulated correlations were justified by explaining them in detail how those correlations apply in real life scenarios.

6.2 Correlating non-functional drainage with access to recreational centers and having green areas for relaxation.

Q13 investigated if the occupants have functional drainage channels. Reported data show that 51% of the occupants have access to functional drainage channels while 49% of them do not. This suggests that for every 1 household which has access to functional drainage channel, there is another 1 household which does not have access to a functional drainage channel.

Q9 investigated if the occupants "have some recreational centers/playgrounds". Reported data show that 63% of them do not have recreational centers/playgrounds. This suggests that more than half of the estates do not have recreational centers/playgrounds.

On the other hand, Q10 investigated if the occupants "have some green areas (with trees/flowers) for relaxation" within their estates. Reported data indicate that 64% of the occupants do not have green areas. This can further be translated to be that above half of the surveyed households lack green open spaces for relaxation. Hence, grey is more than green.

However, the data about Q13 address the slum attribute, "access to adequate sanitation" while the data about Q9 and Q10 address the slum attribute, "sufficient living space". A commonsense implication of sufficient space is that things can conveniently be allocated to designated spots without clustering them chaotically. By extension, one could infer that access to recreational centers by only half of the surveyed households (Q9) depicts insufficient space. Similarly, one can judge lack of green areas for relaxation (Q10) as insufficient space. Thus, it is also possible that those that lack drainage channels do not have sufficient spaces for them (Q13). This is supported by collected data which show that 61% never had drainages in the masterplan while the other 6% show that their drainages have been blocked by new structures. Just the remaining 31% had drainages but are damaged. Therefore, even if a restoration is done for the 31% that had drainages but damaged, there is still a pending 67% percent that has no space for siting new drainages because spaces for them were either never created in the original design or built up with new structures.

Therefore, using "insufficient living space" as a yardstick, one can correlate access to drainage with access to recreational centers and having green areas for relaxation as follows: "those lacking functional drainage channels tend to also lack recreational centers and green areas for relaxation".

The strength of correlation between access to drainage and access to recreational centers Q9 (correlation coefficient) is 0.384 while the correlation between access to drainage and having green areas for relaxation is 0.317. In both cases, there are 100% probabilities (sig = 0.000) that they occur.

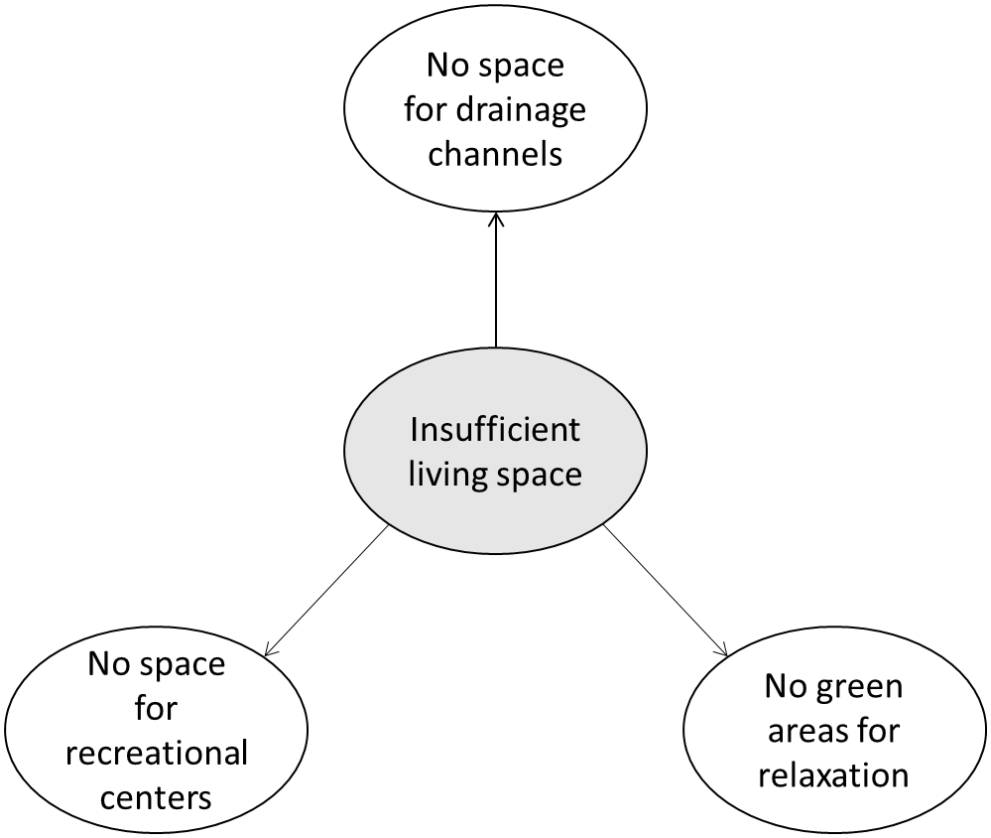

Figure 54: correlating access to drainage with access to recreational centers and having green areas for relaxation (Author, 2023)

6.3 Correlating access to recreational centers with having green areas for relaxation

Section 6.2 above has already analyzed access to recreational centers and having green areas for relaxation. Thus, "those lacking access to recreational centers tend to also lack green areas for relaxation" and vice versa. The strength of correlation between access to recreational centers and having green areas for relaxation (correlation coefficient) is 0. 587. The probability that this occurs is 100% (sig = 0.000).

6.4 Correlating non-functional drainages with cleaning of sewages

Q11 investigated if the occupants "clean the sewage themselves". Reported data in chapter 5 show that only 53% of the occupants clean the sewage themselves while the other 47% do not. This suggests that it is either there is no sewage cleaning at all in the 47% of the households or that some other entity does the cleaning.

For Q13 (see section 6.2), there are 51% functional drainage channels in the study area. This could further imply that it is possible that water flow (especially rainfall) meanders through other unwanted channels, causing other problems such as damages to the roads and the buildings.

Correlating Q11 and Q13: both Q11 and Q13 address the slum attribute, "adequate sanitation". The tangible aspect of sanitation is the visual appeal a clean environment exudes. In line with this visual appeal, a neighborhood without drainage channels may experience constant deposition of garbage on the road surfaces by rainwater flow. Of course, a place littered with garbage deposits from rainwater flow will not be visually appealing. This constant littering of the streets with garbage deposited by rainwater flow could discourage the occupants from cleaning the streets since rainfalls would always sabotage the streets' cleanliness. A disinterest in cleaning the streets due to challenges posed by non-functional drainage channels could trigger disinterest in cleaning the sewages too. This is because sanitation should be holistic and not partial.

Therefore, one could infer that "those who lack access to functional drainage channels tend not to clean their sewages themselves".

The strength of correlation between Q13 and Q11 (correlation coefficient) is 0.317. The probability that this occurs is 100% (sig = 0.000). The probability of this occurring (correlation coefficient) is 0.322 with a 100% significance (sig = 0.000).

Figure 55: correlating non-functional drainages (Q13) and cleaning of sewages (Q11) (Author, 2023)

6.5 Correlating non-functional drainage with connection to water supply and bad roads

As already reported in sections 6.4, Q13 investigated the presence of functional drainage channels in the study area.

Q15 investigated if a housing unit is "connected to a central water supply". Reported data show that only 33% of the surveyed households are connected to the central water supply while the remaining 67% of them are not. This suggests that more than a half of the households surveyed source their water through other unreliable/unsafe alternatives such as well/borehole, tankers/truckers, mobile water vendors, rivers, or streams. Thus, some of the users of alternative sources of water supply may either be exposed to water-borne diseases because of possible poor water hygiene or incur higher cost of water supply because of extra expenditures made towards getting the water and maintaining their sources.

Q21 investigated "conditions of access roads" to the estates. Reported data indicate that only 28% of the surveyed households reported having good access roads to their estates. Out of the 28% with good roads, 13% are wide roads while the other 15% are narrow roads. The other remaining 72% of the surveyed households have bad access roads. Bad roads, in this research context, includes roads that have bare earth in part or in whole as the road surface. Bare earth is known for its looseness and likelihood to attrite into dusts when subjected to pressures from (rain, wind, humans, animals, and vehicular movements). Also, these attritions occur in non-uniform patterns such that they make roads bumpy and unmotorable. These dusts rise into the air to induce both allergic reactions to humans and depleting a building's curb appeal.

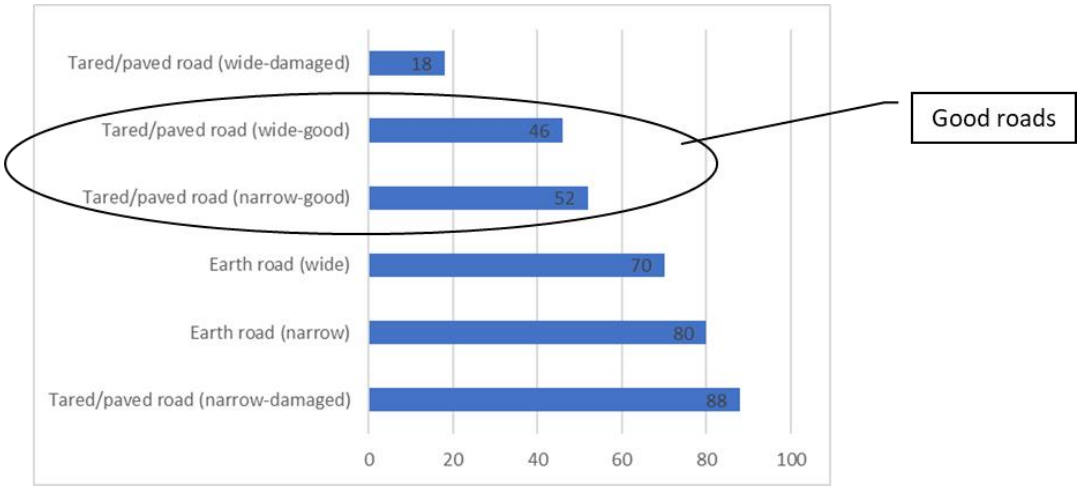

Figure 56: different conditions of roads in the estates (Author, 2023)

Figure 57: Image of an earth road in one of the estates visited (Author, 2023)

Correlating Q13 and Q21, a neighborhood that has no drainage (Q13) would experience water spill over the road surfaces which would further damage those roads (Q21) and make them inconvenient for users especially vehicular movements. Therefore, “those who have non-functional drainage channels tend to also have bad roads”.

The strength of correlation between Q13 and Q21 (correlation coefficient) is 0. 355. The probability that this occurs is 100% (sig = 0.000).

Thus, correlating Q13 with Q15, water supply pipes are usually laid (buried) underground (Q15) to protect them from damages while drainages (Q13) are created to guide the water away from flowing into unwanted places. Thus, over time, a neighborhood without drainage channels (Q13) would experience straying of water (rain and other excess water discharges). The stray water flow does not only damage the roads but also erode the soil progressively till they unearth buried water pipes – this subjects the water pipes to damages and deprives the households of the opportunity to connect to the central water supply. Therefore, “those who lack access to central water supply tend to also lack access to functional drainage channels”. The strength of correlation between Q13 and Q15 (correlation coefficient) is 0.470. The probability that this occurs is 100% (sig = 0.000).

In summary, those who lack functional drainage channels tend to lack both good roads and access to central water supply.

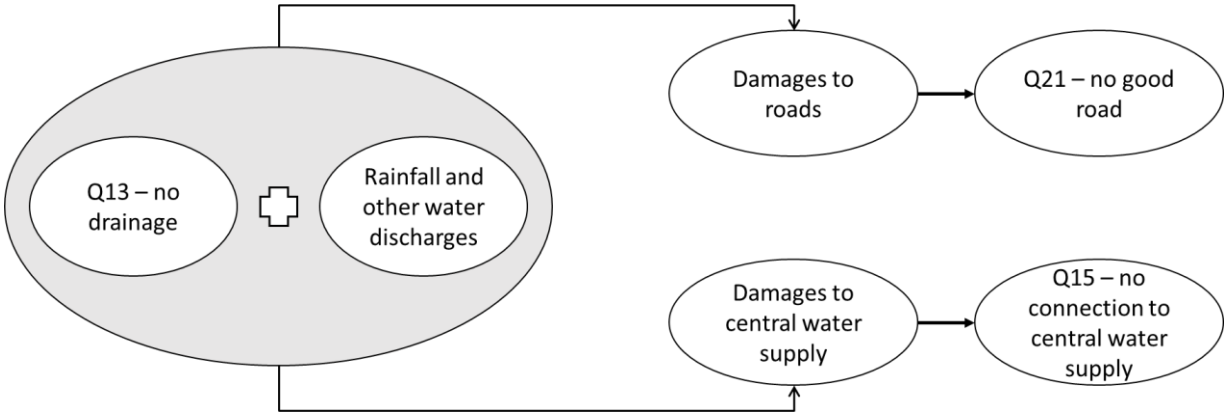

Figure 58: correlating non-functional drainage channels (13) with bad roads (Q21) and no access to central water supply (Q15) (Author, 2023)

6.6 Correlating access to recreational centers with connection to water supply

Q9 investigated if households have access to recreational centers (see section 6.3). Using the analogies established of Q9, insufficient space is a possible reason for lack of recreational centers.

On the other hand, Q15 investigated if an estate is connected to the central water supply. Although, as correlated between Q15 and Q13, "those who lack access to central water supply tend to also lack access to functional drainage channels", insufficient space indirectly also affects connection to central water supply. This is because insufficient space connects with lack of drainages while lack of drainages causes water spillage that unearths buried water pipes, subjecting them to damages.

Therefore, insufficient space is central to the lack of recreational centers and lack of access to central water supply.

Thus, correlating Q9 and Q15, "those who lack access to central water supply tend to also lack recreational spaces in their estates".

The strength of correlation between Q9 and Q15 (correlation coefficient) is 0. 383. The probability that this occurs is 100% (sig = 0.000).

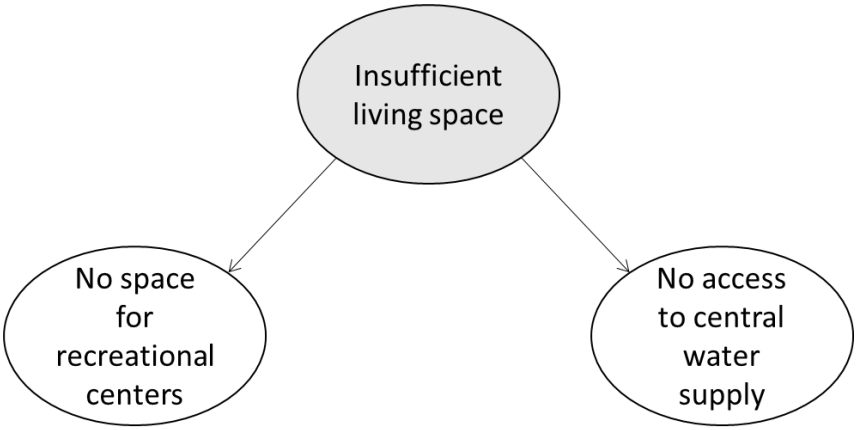

Figure 59: correlation between lack of recreational center (Q9) and non-access to central water supply (Q15) (Author, 2023)

6.7 Correlating connection to water supply with cleaning of sewage

Q15 investigated if a household is connected to the "central water supply". Collected data show that 67% of the surveyed households lack access to the central water supply. From another perspective (different from section 6.6), lack of access to the central water supply suggests a possibility of people getting water from non-state sources of water supply. This is because central water supply is managed and delivered by the government only. It then suggests that 67% of the surveyed households lack water supply service from the government.

Q12 investigated occupants' opinions on who should take care of their sewages. Collected data (fig 60) show that 58% of the occupants prefer other non-state agencies to take care of their sewages.

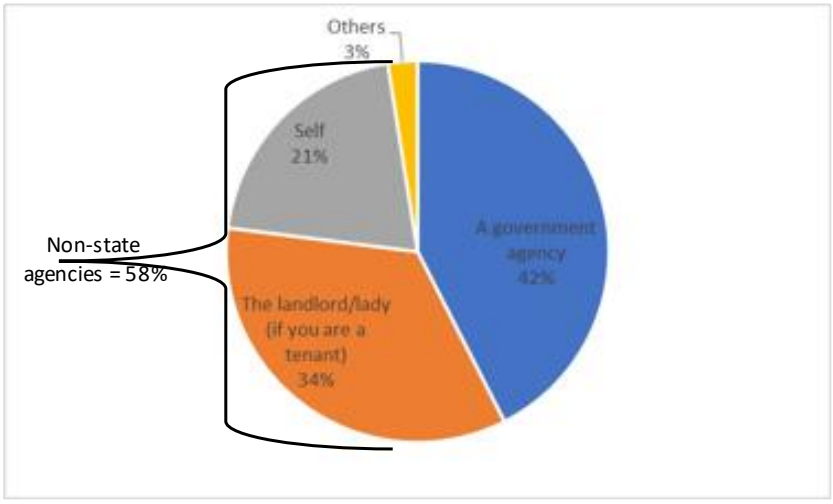

Figure 60: occupants' opinions on who should clean the sewage (Author, 2023)

Correlating Q15 and Q12, one can infer that due to the government's failure to sustain provision of adequate water supply, more people tend to lose trust in the state, and increasingly prefer other non-state solutions to service provision. Hence, 57% of the surveyed households prefer non-state agencies to clean their sewages.

Therefore, those "those who lack access to central water supply tend to prefer more of other non-state agencies to clean their sewages".

The strength of correlation between Q15 and Q12 (correlation coefficient) is 0. 427. The probability that this occurs is 100% (sig = 0.000).

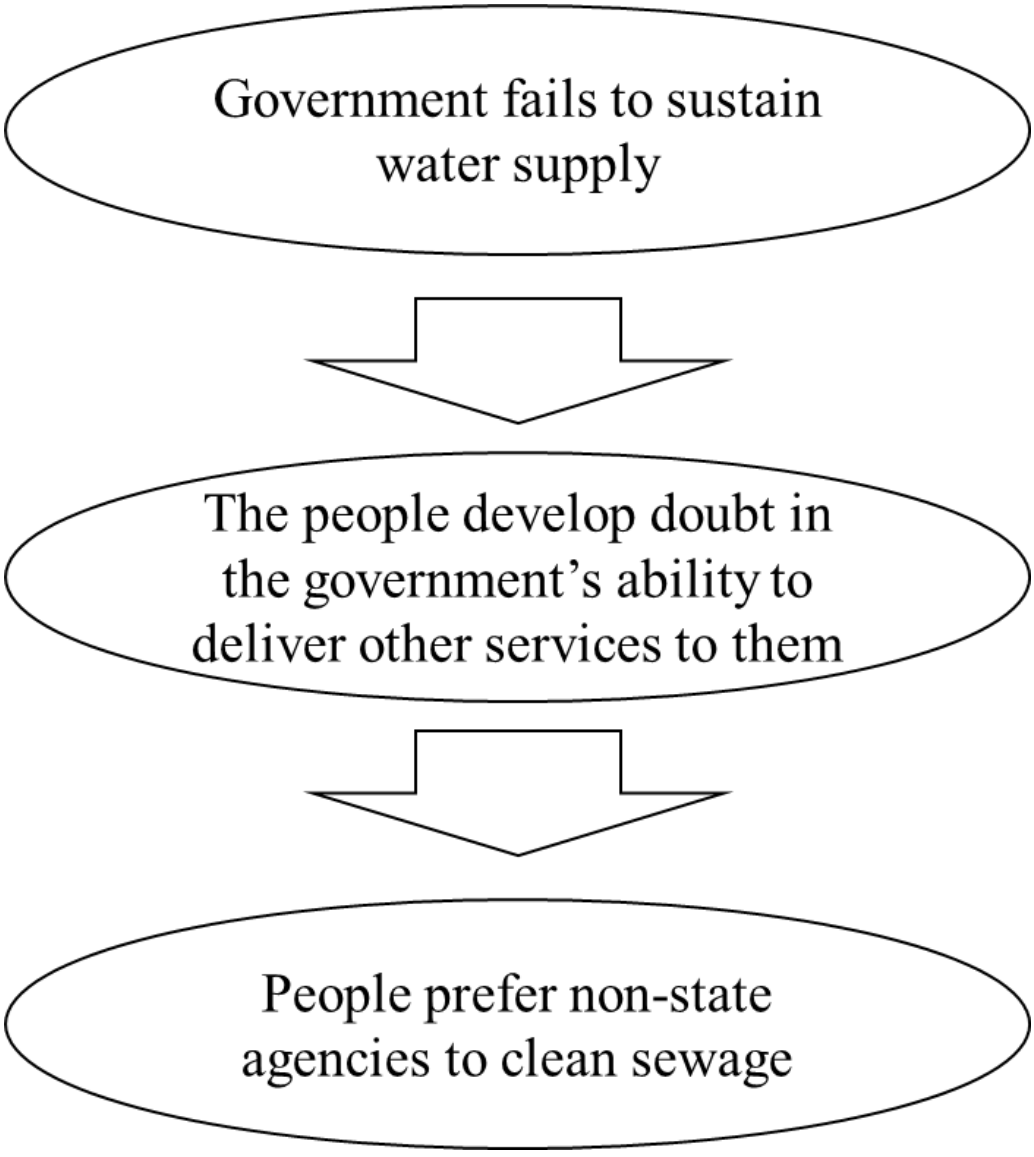

Figure 61: correlation between access to central water supply (Q15) and preferred sewage cleaning agency (Q12) (Author, 2023)

6.8 Correlating non-functional drainage with affordability of renting a home and responsibility to clean sewage

Q14 investigated the reason some people do not have functional drainage channels. Collected data show that 31% of the respondents indicated that drainage channels were constructed but are damaged. Another 61% of the respondents indicated that drainage channels were not included in the masterplan of their estates originally. This goes further to validate the claim (in section 6.2) that there is insufficient living space. This is because if a drainage channel is not included in the original masterplan design, spaces that would have been used for the drainages might have been used up for building other structures (including houses).

Figure 62: images of blocked drainage channels (Author, 2023)

On the other hand, Q4 investigated how much tenants pay as their rent per annum while Q11 investigated who cleans a household's sewage. Collected data (table 14) show that 68% of the surveyed households pay the lowest range (₦300 – ₦400 thousand) among the list of rents provided in the questionnaire. Payment of the lowest range of rents by the 68% of the tenants raises a suspicion that the houses might be affordable – we shall see in the next paragraphs.

Q4. if you are a tenant, how much rent do you pay in 1 year?	Responses	% Responses
₦300 – ₦400 thousand	136	68
₦401 – ₦500 thousand	54	27
₦501 – ₦600 thousand	4	2
₦601 – ₦700 thousand	2	1
ABOVE ₦700 thousand	2	1
Free, squatting, living with relative	0	0

Table 18: Cost of rents in study area of Enugu (Author, 2023)

Correlating Q14 and Q4, however, one could infer that the rents for those houses are low because of their poor qualities. Poor quality here implies lack of sanitation (no drainages) and insufficient spaces for inclusion of those drainages. This suggests that the poor quality of a property reduces its market value and influences its cost too.

Therefore, "tenants who can only afford the lowest range of rents (₦300 – ₦400 thousand) seem to be those that can only afford properties in estates built without drainages in their original design (masterplan)".

The strength of correlation between Q14 and Q4 (correlation coefficient) is 0. 310. The probability that this occurs is 100% (sig = 0.000).

Figure 63: correlation between non-functional drainages (Q14) and cost of rent (Q4) (Author, 2023)

For Q11, 53% of the households surveyed clean their sewages by themselves while the other 47% do not clean the sewage by themselves. The 47% who do not clean the sewages by themselves include those who do not clean the sewage at all, private agencies, or government agencies. Cleaning of sewage is supposed to be an expert service rendered by people professionally trained to do it – these professionals can either be a government agency or a private agency. Thus, if 53% of the households clean the sewages themselves, they may not do it well because they are not professionally trained to do it. This implies that there is a possibility of poor sewage cleaning among 53% of the households.

Putting Q14 into perspective once again, 61% of the respondents indicated that they do not have functional drainage channels because they were not included in their estate masterplans originally. Absence of drainage channels promotes poor sanitation. If the poor sanitation emanated from design, making any sanitary improvement might require some redesign or demolitions – cost and the difficulty of demolition may discourage the estate management from doing it. If the estate is unclean by virtue of poor design, people might feel no need to conduct further sanitations (such as sewage cleaning) if it brings no significant sanitary improvement into the estate.

Therefore, correlating Q14 and Q11, one could infer that due to poor sanitation, "majority of those who lack access to functional drainage channels because of its non-inclusion in the masterplan also tend not to clean their sewages themselves".

The strength of correlation between Q14 and Q11 (correlation coefficient) is 0. 309. The probability that this occurs is 100% (sig = 0.000).

Figure 64: correlation between functional drainage (Q4) and cleaning the sewage (Q11) (Author, 2023)

6.9 Correlating renting/owning a home with responsibility to repair breakdown and affordability of buying a home

Q2 investigated among the households who owns or rents their homes. 44% own their homes while 56% rent theirs. This suggests that nearly half of the households own their homes while the other half rent their homes.

On the other hand, Q25 investigated whose responsibility it is to repair breakdowns in the house. Two groups ranked highest – 42% said that the repair is done by the landlord while 46% said that they repair breakdowns themselves. The other 5% and 7% are split between government agency and those who repair and receive refund respectively.

Q25. whose responsibility is it to repair breakdowns in your house?	Responses	% Responses
the landlord/lady (if you are a tenant)	150	42
self-funded	162	46
a government agency	16	5
Repair and receive refund	26	7

Table 19: whose responsibility it is to repair breakdowns in a household (Author, 2023)

Correlating Q2 and Q25, consider that 44% own their homes while 56% rent theirs (Q2). Therefore, the result from Q25 could also imply that those (42%) who depend on the landlord for the repairs of breakdowns are the tenants while those (46%) who repair the breakdowns by themselves are the homeowners. This can further be understood thus: "tenants, as opposed to homeowners, tend not to repair breakdowns in their homes by themselves but rather depend on the lessor to repair the breakdowns". Therefore, increase in the number of tenants means decrease in the number of households willing to repair breakdowns by themselves. This further implies that no tenant repairs breakdowns in their homes. Therefore, homeowners, whether they occupy the dwellings or rent them out, always bear the cost of repairing breakdowns in the house. This exonerates the tenants from the responsibility of repairing breakdowns. Thus, if a tenant does not report damages to the landlord or the landlord does not inspect a property, there are high chances that such damages would remain and degenerate further into slums when they multiply.

The strength of correlation between Q2 and Q25 (correlation coefficient) is -0.339. The probability that this occurs is 100% (sig = 0.000).

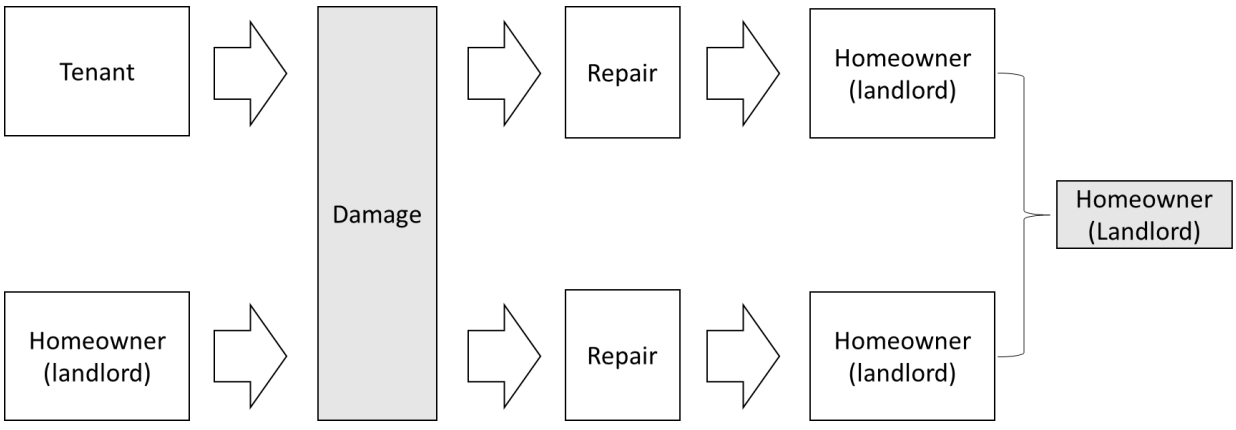

Figure 65: correlating owning a residence (Q2) with the responsibility to repair damages (Q25) (Author, 2023)

On the other hand, Q6 investigated how much a household can afford to buy a home. 80% of them can afford the lowest range of cost (₦15 – ₦20 Million). This suggests that majority (80%) of them are low-income earners.

Q6. at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase?	Responses	% Responses
₦15 – ₦20 million	192	80
₦21 – ₦25 million	40	17
₦25 – ₦30 million	2	1
above ₦30 million	0	0
NONE OF THE ABOVE	4	2

Table 20: how much households can afford to buy a home (Author, 2023)

Correlating Q2 and Q6, one could infer that "ownership of houses tends to decrease as the selling price of housing increases".

The strength of correlation between Q2 and Q6 (correlation coefficient) is -0.321. The probability that this occurs is 100% (sig = 0.000).

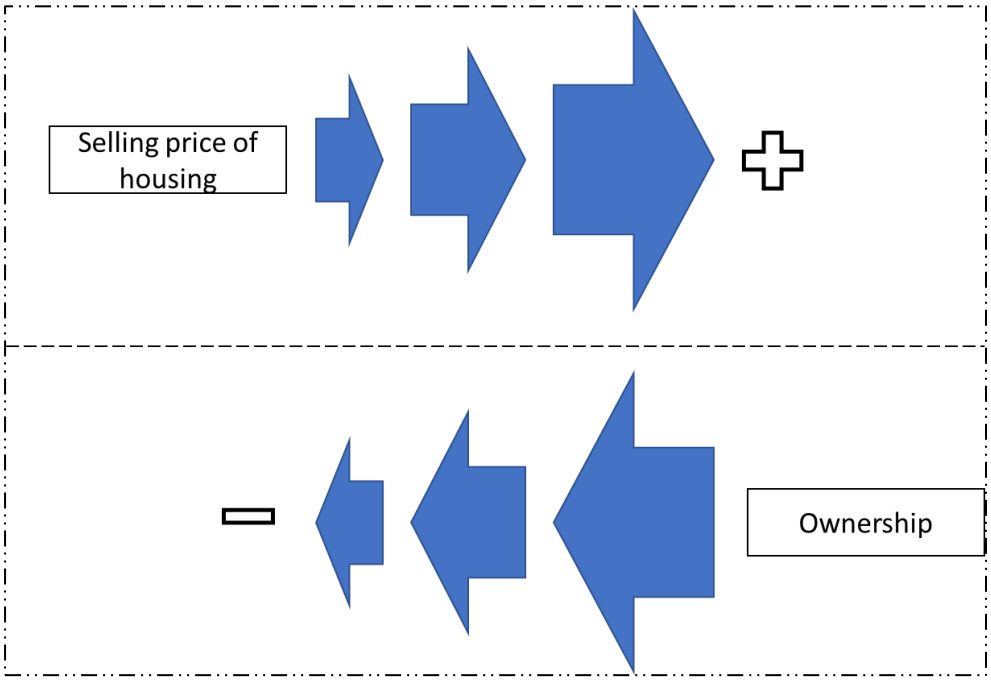

Figure 66: correlating owning a residence (Q2) with how much a household can afford to buy a home (Q6) (Author, 2023)

6.10 Correlating affordability of renting a home with affordability of buying a home and repair of roads

Q5 investigated how much rent a household can afford to pay per annum. 79% of the households can afford the lowest range of the rents listed (₦300 – ₦400 Thousand). This indicates that most (79%) of the households are low-income earners.

5. if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year?	Responses	% Responses
₦300 – ₦400 thousand	154	79
₦401 – ₦500 thousand	40	20
₦501 – ₦600 thousand	0	0
₦601 – ₦700 thousand	0	0
₦700 thousand – ABOVE	2	1

Affordability of rents by households in the study area (Author, 2023)

On the other hand, Q6 investigated how much a household can afford to buy a home. 80% of them can afford the lowest range of cost (₦15 – ₦20 Million). This suggests that majority (80%) of them are low-income earners. Therefore, because of their low incomes, both the cost of buying and the cost of renting a home are unaffordable to the households.

Correlating Q5 and Q6, it could be inferred that "affordability of renting a house tends to decrease as the affordability of buying also decreases".

The strength of correlation between Q5 and Q6 (correlation coefficient) is 0.490. The probability that this occurs is 100% (sig = 0.000).

Furthermore, Q22 investigated if there is routine repair of roads in the estates. 93% of the respondents said "no" while the other 7% said "yes". Therefore, almost all (93%) of the roads are not repaired.

Correlating Q5 and Q22, it could be opined that "those whose estate roads lack maintenance seem to be those who can only afford the lowest range of rents (₦300 – ₦400 thousand)".

The strength of correlation between Q5 and Q22 (correlation coefficient) is 0.374. The probability that this occurs is 100% (sig = 0.000).

6.11 Correlating proximity to schools with proximity to hospitals and proximity to markets

Q18 investigated the distances of various households from nursey/primary schools. 98% of them require 1 hour travel or less to reach a school. The other 2% requires more than 1 hour. Therefore, schools are located at short distances from the neighborhoods.

Q18. How Far Is Your House/Apartment from a Nursery/Primary School?	Responses	% Responses	
Walking Distance (Less Than 10 Minutes)	56	16	Less than 1 hour
11 – 30 Mins Drive	166	47	
31 Mins – 1 Hour Drive	124	35	
1 Hour and Above	8	2	

Table 21: households' travel distances to schools (Author, 2023)

Q17 investigated the distances of various households from hospitals/clinics. 100% of them require 1 hour travel or less to reach a hospital/clinic. This also means that hospitals/clinics are located at short distances from the neighborhoods.

Q17. How far away is your house/apartment from hospitals/health centers/clinics?	Responses	% Responses	
Walking Distance (Less Than 10 Minutes)	52	15	Less than 1 hour
11 – 30 Mins Drive	210	59	
31 Mins – 1 Hour Drive	92	26	
1 Hour and Above	0	0	

Table 22: households' travel distances to hospitals (Author, 2023)

Correlating Q18 and Q17, it can be inferred that "those who live close to schools tend to also live close hospitals/health centers".

The strength of correlation between Q18 and Q17 (correlation coefficient) is 0.370. The probability that this occurs is 100% (sig = 0.000).

Furthermore, Q19 investigated the distances of various households from markets and shopping centers. 98% of them require 1 hour travel or less to reach markets and shopping centers. Therefore, markets and shopping centers are located at short distances from the neighborhoods (see also figure 66 for photo evidence).

Q19. How far is your house/apartment from markets and shopping centers?	Responses	% Responses	
Walking Distance (Less Than 10 Minutes)	34	10	Less than 1 hour
11 – 30 Mins Drive	168	47	
31 Mins – 1 Hour Drive	146	41	
1 Hour and Above	6	2	

Table 23: households' travel distances to shopping centers (Author, 2023)

Figure 67: Example of a chain of shops located within a residential area (Author, 2023)

Correlating Q18 and 19 could suggest that "those who live close shopping centers tend to also live close to schools".

The strength of correlation between Q18 and Q19 (correlation coefficient) is 0.379. The probability that this occurs is 100% (sig = 0.000).

In summary, the three correlations (Q17, Q18, and Q19) holds that all the neighborhoods are evenly located at short distances from shops, clinics, and schools (figure 67).

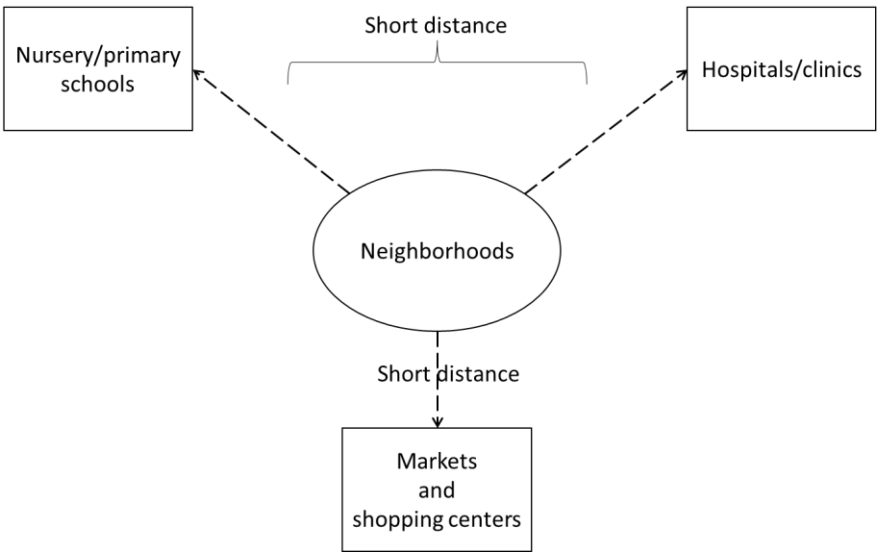

Figure 68: correlating distance from schools (Q18) with distances from hospitals (Q17) and shopping centers (Q19) (Author, 2023)

Indeed, locating shops, schools, and hospitals at short distances from the neighborhoods is good for ease of access to the people. However, observation made during the data collection suggest that those facilities (shops, schools, and hospitals) were afterthoughts which were never originally included in the masterplan (figure 69). Hence, some of them seem to mismatch functionally and aesthetically with the other structures in the estates in which they are located.

Figure 69: picture of unauthorized shop marked for demolition by the state authority in RCC quarters, Enugu (Author, 2023)

Figure 70 summarizes all the correlations which were already interpreted in (section 6.2 – 6.11). Figure 70 further shows that Q13 (does your neighborhood have functional drainage channels?) correlates with much more variables (five other variables) than the rest. Hence, having/not having drainages is the most critical of all the issues raised in the survey. The variables that correlate with Q13 are Q9, Q10, Q11, Q15, and Q21.

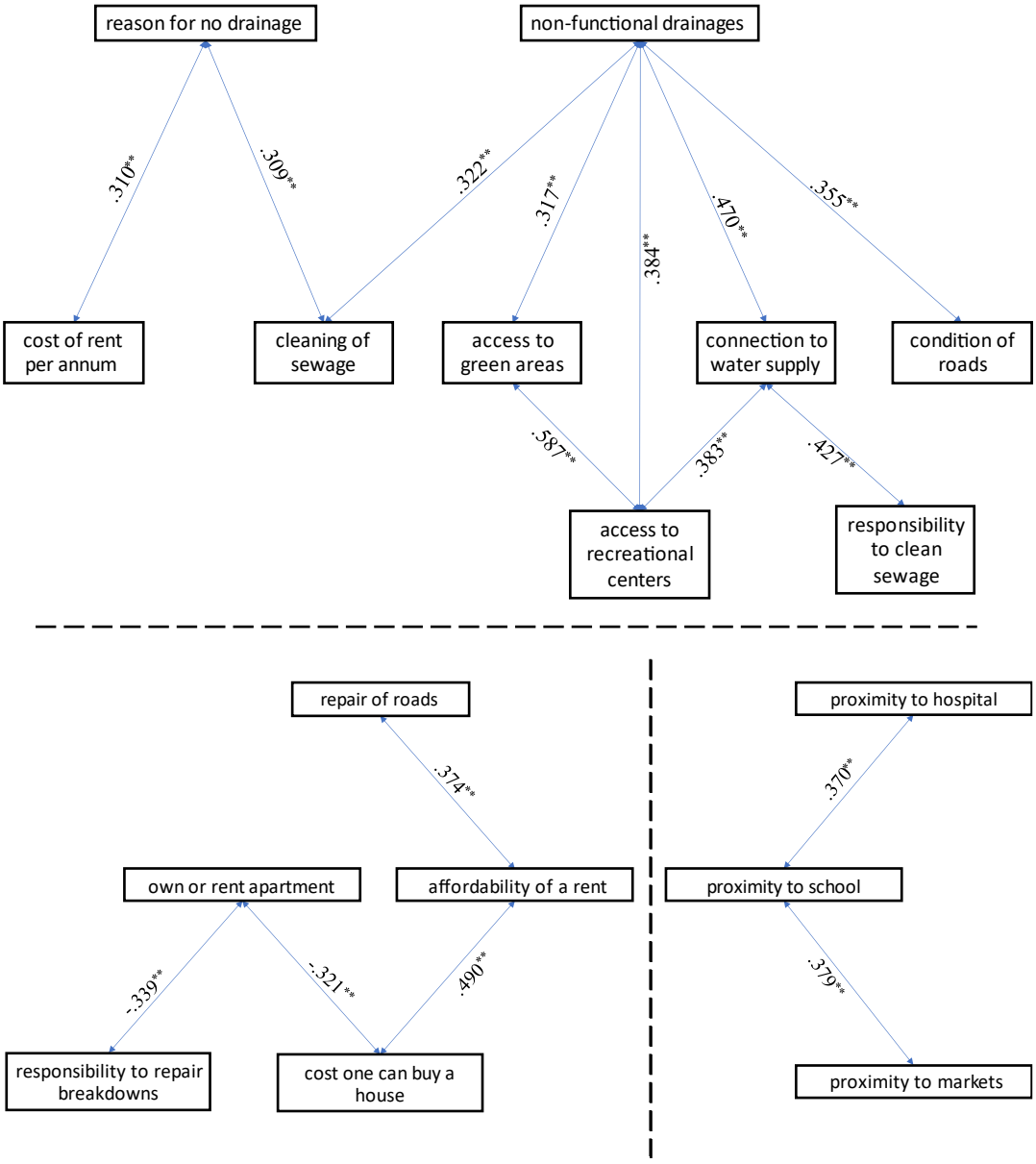

Figure 70: summary of all correlations (Author, 2023)

Furthermore, table 24 is a legend showing the full names of each variable represented in fig 70. Table 24 also shows which slum attribute each variable belongs to. This is to enable me/the reader to understand which attributes have more problems than the others in the study.

	No.	Question as used
TENURE SECURITY/HOUSING AFFORDABILITY	Q2	do you own or rent your apartment?
	Q4	if you are a tenant, how much rent do you pay in 1 year?
	Q5	if you are a tenant, how much can you afford to rent a decent 3-bedroom house/apartment for 1 year?
SUFFICIENT LIVING SPACE	Q6	at what price can you afford to buy a decent 3-bedroom dwelling either mortgage or outright purchase?
	Q9	Within your estate, do you have some recreational centers/playgrounds?
	Q10	Do you have some green areas (with trees/flowers) for relaxation within your estate?
ACCESS TO ADEQUATE SANITATION	Q11	do you clean your sewage by yourself?
	Q12	if no, in your opinion, who should take care of your sewage?
	Q13	does your neighborhood have functional drainage channels (gutter)?
	Q14	if no, why?
EASY/SUFFICIENT ACCESS TO SERVICES	Q15	is your house/apartment connected to the central water supply?
	Q17	How far away is your house/apartment from hospitals/health centers/clinics?
	Q18	How far is your house/apartment from a nursery/primary school?
	Q19	How far is your house/apartment from markets and shopping centers?
	Q21	What is the condition of access roads to your estate?
DURABLE HOUSING OF PERMANENT NATURE	Q22	is there consistent/routine repair of roads in your estate?
	Q25	whose responsibility is it to repair breakdowns in your house?

Table 24: grouping of the selected correlation variables into their appropriate slum attributes (Author, 2023)

The grouping of correlated variables in table 24 shows that most of the highly significant correlations (five questions) fall under easy/sufficient access to services. The second in the hierarchy is access to adequate sanitation (four questions), while the third in the hierarchy are two: tenure security/housing affordability and sufficient living space (with three questions each under them). Durable housing of permanent nature occurred least in the hierarchy (two questions). Figure 28 further illustrates how each individual variable correlates with another, irrespective of to which attribute it belongs.

6.12 Synopsis

Although the housing unit is what shelters people, there are other services and utilities which help the housing unit to function. Services in this research context are shopping centers, schools, and hospitals while the utilities in this research context include drainage channels, recreational centers, green areas for relaxation, and water supply pipes. Availability of those utilities and how they perform matter in determining which of them predisposes a decent neighborhood to slum emergence. Therefore, housing, in this research context, refers to both the housing unit itself and other external spaces associated with it.

Using a structured questionnaire, 25 survey data were collected from non-expert respondents. However, this analysis was based solely on 16 pairs of variables that showed signs of higher significance of occurrence than the others.

Based on the primary survey data collected and analyzed; inferences were drawn. These inferences summarily form the households' (non-experts') opinions on affordable housing in the study area.

1. Insufficient space – while the analysis could not determine if the interior spaces are sufficient or not, it clearly determined if that there is insufficient external space in the study area. Thus, the following external spaces are not available:
    a. 63% of the people do not have recreational centre.
    b. 64% of the people do not have green areas for relaxation.
    c. 51% of the people do not have functional drainage channels.
2. Poor sanitation – sequel to the insufficient space determined in the study area, some poor sanitary situations exist in the study area. Poor sanitation reflects itself in the form of people not cleaning their sewages and in the form of non-functional drainage channels. Some were due to non-inclusion in the masterplan while some were due to alteration of open spaces or

change of use which hinders the possibility of other sanitary utilities to function. Thus, the following poor sanitary situations exist:

   a. 45% of the people have no drainage channels.
   b. 47% of the people do not clean their sewages.

3. No access to services – also due to insufficient space in the study area, some services and utilities could not be installed. However, some missing services and utilities were previously available but remote impacts of insufficient spaces made them to disappear. For instance, some people who are not connected to the central water supply could claim that straying water due to non-functional drainages eroded soil surfaces to expose the buried water pipes to damages by human and vehicular impacts.
   a. 67% of the people are not connected to the central water supply.
   b. 72% of the people have bad access roads.
4. Affordability/tenure security – despite being developed to address the needs of the low-income people, houses in the study area are unaffordable for the people to either rent or buy. With more occupants living as tenants especially when they cannot afford the rents, more people are tenure insecure. This is because tenure security of the occupants depends on their degrees of temporality of stay in those properties without eviction. Thus:
   a. 56% of the households are tenants (renters).
   b. 79% of the tenants can only afford the lowest range of rents for the houses they occupy.
5. Housing durability – due to poor sanitation (also non-maintenance), houses in the study area have decayed and dropped in quality (see fig 69). Consequently, those houses bear low values. Thus:
   a. 21% of the houses have cracked walls.
   b. 45% of the houses have damaged/leaking roofs.
   c. 33% of the houses have other unnamed damages.
   d. 56% of households (all tenants) depend on the lessors to repair their damages.

In summary, analyzed data show that the housing conditions in the study area conform with all the five attributes of a slum in varying degrees. While there are 16 most highly significant variables whose correlations indicate the emergence of slum, the most critical issues are:

1. Insufficient external spaces – no recreational centres and no green space for relaxation.
2. Poor sanitation – no drainage and no sewage cleaning.

3. Unaffordable rent/cost of buying a home.
4. No access to services – no connection to water supply and bad roads.
5. No maintenance of housing units – cracked walls and damaged roofs.

Since all the 36 states of Nigeria operate with the same national housing policy, all of them are likely to have similar housing challenges (of unaffordability and slum emergence) as obtainable in the Enugu. Therefore, the conformity of the study area with all the attributes of a slum implies that government housing schemes across Nigeria are turning into slums.

There are some deficiencies in the urban governance system which lead to slum emergence from decently built affordable housing schemes. Based on data collected and analyzed, the deficiencies which lead to slum emergence from decent affordable housing schemes (adapted from answering research question 2) are as follows:

1. Poor planning.
2. Poor management.
3. Non-implementation of the housing policy and loopholes in the housing policy.

Chapter 7: measures required to deliver slum-proof housing schemes.

7.1 Introduction

Chapter 2 addressed research question 1 (the conceptual link between slum and affordable housing) – the conceptual link between slum and affordable housing is that those who seek housing either in slums or in affordable housing schemes are low-income earners. Furthermore, chapter 6 addressed research question 2 (What deficiencies in affordable housing schemes in Enugu State lead to the emergence of slums?). From a policy perspective, both poor/non-implementation and some loopholes in the Nigerian housing policy promote housing shortage, unaffordability, and poor slum emergence. Emerging from expert data, poor planning and poor management of the estates promote growth of slums. From the non-experts' perspective, the existing housing units conform to all the attributes of a slum. Thus, this chapter 7 addresses research question 3 (What measures are needed to help deliver slum-proof housing schemes?). Hence, answers to research question 3 (recommendations) are based on the problems identified from answering research questions 1 and 2.

Therefore, in this research context, the measures required to make a housing scheme slum-proof are split into three arms. The first arm addresses poor planning, the second arm addresses poor management (chapter 5 – section 5.2.8), while the third arm addresses policy problems.

7.2 To address poor planning

In this research context (expert data), poor planning results to uncompleted/abandoned construction, delivery of unaffordable housing and omission of some services/utilities (green areas, recreation, shopping centers) from the design. The non-experts validated this opinion by indicating that their dwellings lack connection to water supply, lack good access roads, lack drainage channels, lack recreational centers, and lack green areas for relaxation. Above all, the housing is unaffordable as above 50% of the households are tenants rather than owners. If the planning for these housing schemes were good, they would have been completed and not abandoned; they would be affordable, and they would have adequate spaces (for recreation, relaxation, and installation of all the relevant services/utilities). Additional to expert and non-expert data collected, observations during the field visit show that there are alterations to original housing design especially erection of shops within the residential neighborhoods (see figure 70). Image captured in figure 70 contradicts the various estate masterplan designs (see appendix) in which most places were designed as residential areas with few locations mapped

for commercial, recreational, and other non-residential activities. However, people keep building shops within the residential areas. Therefore, to address poor planning, three solutions are recommended: co-financing – separate ownership, “reformed” incremental housing, and zoning.

Figure 71: picture showing shops built within residential areas (Author, 2023)

7.2.1 Co-financing – separate ownerships

Based on literature it was noted in chapter 1 – section 1.3 that "no public servant in Nigeria below salary grade level 13 in the federal civil service, and salary grade level 16 in the state civil service, can afford a property valuing N4.75m (12337.662USD) on a 25 years mortgage at 6% if he devotes 50% of his salary per annum to housing" (Ugochukwu & Chioma, 2015). The expert data in chapter 5 (section 5.2.1) validated this claim by indicating that Enugu's population is predominantly made up of civil servants with low-income, who cannot afford above-average housing. Similarly, non-expert data showed that more than 50% of the households surveyed were tenants who could not afford to own their dwellings and resorted to renting. These data suggest that it is difficult for a single low-income family (or individuals) to own or finance a dwelling unassisted. Therefore, sharing the cost of buying a home (co-financing) can help low-income earners achieve ownership of their dream homes. Ideally, co-financing might connote cost sharing such as when two or more people split a cost which would have been borne by one person to achieve a relief. Such partnerships exist, where people contribute resources to acquire a property (but) as an investment rather than to live in them (Anene, 2016). However, in this recommendation's context, people shall acquire properties to live in them. Unfortunately, splitting the cost of one housing unit between two or more households only addresses the issue of affordability but does not address the problem of accommodation or sufficient space. This is because two or more separate households are pulling resources together just to acquire one housing unit because, they cannot afford same size of housing unit individually. Secondly, if the two or more households were to live together in the jointly acquired single housing unit, they may not live harmoniously together because of behavioral heterogeneity which may exist among them. Therefore, to achieve co-financing – separate ownerships, a befitting housing design model which allows the constituent households to enjoy their respective privacies should be introduced. However, because the individual households involved in the co-financing earn low incomes and cannot afford the full cost of buying their housing at once, a "reformed incremental housing" is recommended for them. This reformation is to salvage the benefits of existing incremental housing solution while improving on its current shortfalls, especially its tendency to evolve into a slum. Therefore, reformed incremental housing is intended to develop a housing construction model that allows co-financiers to build gradually and individually even though they jointly purchased the property.

7.2.2 Reformed Incremental Housing

Existing incremental housing solution (see chapter 2 – 2.2.2) merely focuses on building houses gradually within the convenience of the homeowner without deadlines. Thus, each homeowner has the liberty to decide when to start or stop the construction. However, chapter 2 of this thesis argues that this liberty to decide when to resume a pending construction makes incremental housing a breeding ground for slum formation over time. Therefore, the recommended reform in incremental housing is that a design should be made with the consideration that they are not for a single family but for separate dwellings of two or more households (see figure 72). This is to allow each owner to exercise their absolute privacy even though more households pulled resources together to acquire the shelter. Examples of prototypes that can provide such privacies include semi-detached housing units or terraced buildings. The space advantage in either semi-detached or terraced buildings is that land consumption is minimized because two or more separate dwellings are only separated by party walls without the need to observe boundary setbacks all around each individual housing unit (see figures 72 and 73). Setback (peculiar to each state or local ordinance) refers to the minimum distance required by law to be kept between the boundaries a plot and the housing being erected (City of Parksvile, 2015).

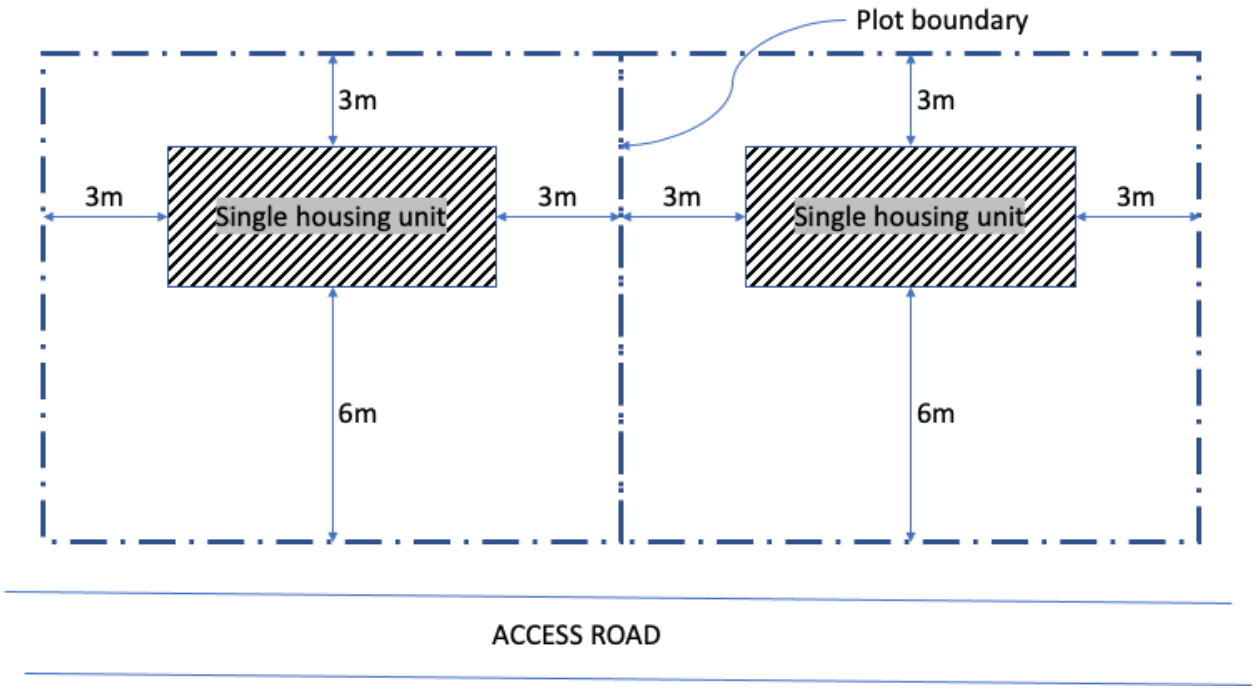

Figure 72: single housing units on separate plots of land with each unit observing setbacks all-round the building (Author, 2023)

In figure 72, there are two housing units separated from one another on two separate land parcels. This separation requires that each housing unit marks off a minimum distance of 3 meters from left, back and right sides of the property line, and marks off 6 meters from the front side of the property line.

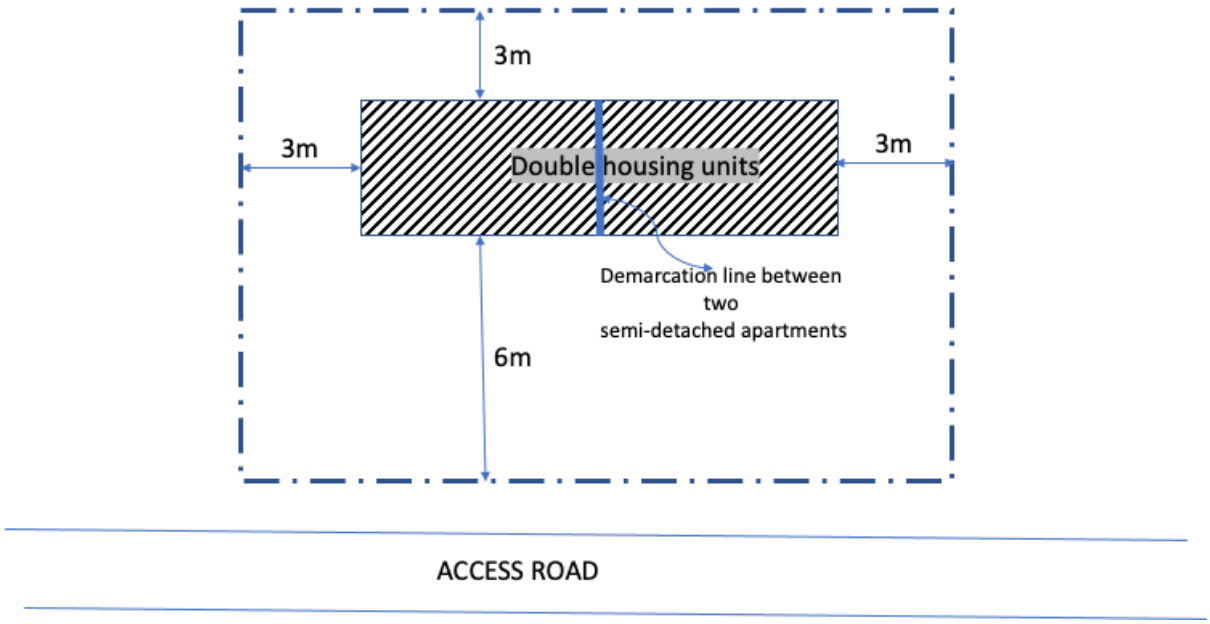

Figure 73: double housing units with both housing units sharing single plot of land and common setback (Author, 2023)

In figure 73, there are two housing units conjoined but only separated by a wall to define the portions exclusive for each household. In this case, although, there are two housing units, they exist as a single building requiring a common setback from around the land parcel on which they are built. Therefore, the land spaces which should have been marked off in the case of single separated housing units (figure 72) have been gained and utilized for some other purposes either to build more rooms or create larger outdoor space for the occupants.

However, since the existing incremental housing model predisposes a place to slum formation, “reformed incremental housing” solution is considered for slum prevention therein. This means, making substantive changes to the existing incremental housing approach in use which did not stop slum emergence. Therefore, to avert the incidents of slum formation, the developer must set out the framework of the housing prototype and roof over the entire area. Then, when future owners buy the uncompleted building, they are confined to building within the laid-out area already roofed over by the developer. This is because any attempt to build beyond the outlined buildable area would leave the extended part uncovered and requires alteration of the

roof members to achieve a total coverage. It is likely that the cost of altering the roof to achieve an after-thought extension to a housing prototype would be high and unattractive to the homeowner. Hence, alteration will be minimized, and chances of slum incidents will also be reduced.

Furthermore, since co-financing is done to reduce the financial burden on a single home buyer, care should be taken to ensure that the initial procurement cost of an incremental housing prototype does not outweigh the collective purchasing powers of the contributors. Therefore, to deliver those housing prototypes at affordable prices, the prototypes should be built such that the same amount of money it costs to build a single-family housing unit can be used to develop two partially completed housing units for two households which are in conditions of habitability (see chapter 2 – 2.2.2). The idea is that the labor and material inputs towards the partial completion of the housing units would be minimal to reduce the selling price of the house but preserves the quality and decency of the housing unit. Later, if a household saves more money, they can expand the house based on design prototypes already provided by the developer (see fig 74). However, if an owner wishes to alter the specifications, they need to seek the consent of the developer to ascertain feasible modifications.

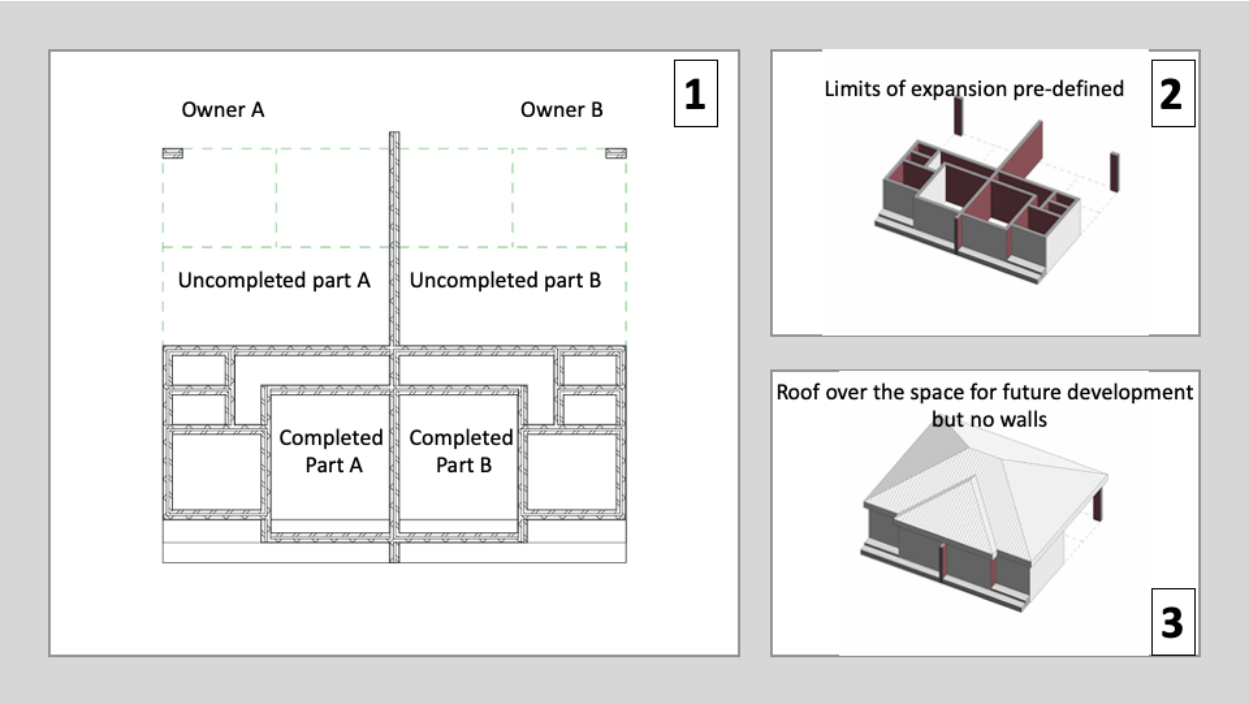

Figure 74: semi-detached housing prototype for incremental construction (Author, 2023)

In summary, reformed incremental housing will help to minimize waste of land spaces because instead of building single units of housing separately on isolated parcels, more housing units can be built on a parcel by making them semi-detached or terraced. Reformed incremental housing scheme will also regulate slum emergence due to its requirement that homeowners must comply with the laid-out housing prototypes issued by the developers. Reformed incremental housing will also be affordable because, just as the existing method, homeowners will build gradually without time pressure to meet deadlines. Therefore, low-income people can access housing at affordable costs through reformed incremental housing.

7.2.3 Zoning

Masterplans of existing housing schemes have their respective land uses distinctly zoned in isolation from one another (see index). For instance, residential areas are only residential, and are separated from central commercial areas such as shopping centers or small kiosks (see fig 74). However, some of the estates visited during data collection seemed to have shops at several intervals within the residential areas. This depicts that it is either that the people do not comply with the zoning, or that the zoning is ineffective. The latter seems true when judged by the Igbo planning system. The Igbo planning system accommodates neighborhood shops and people can use their homes as workplace for whatever services they render – it also has a distinct central location for bigger markets (Ikebude, 2009; Okoye & Ukanwa, 2019). However, the masterplan of the estates visited did not provide spaces for neighborhood shops. Maybe it is true that the "European standard in housing construction and neighborhood development" (Ononugbo et al. 2010) was adopted without checking how to balance them with the local context. Hence, people continue to raise shops around their homes in nostalgia for the Igbo spatial planning systems which they are familiar with. Also, the settlement patterns of the Igbos are nucleated (Adedeji, 2011; Nsude, 1987). This means that they live in individual clusters which only distinguish large extended families from one another but do not separate commercial from residential.

Therefore, this thesis recommends that a new masterplan model be created for future government's housing schemes in Enugu to reflect the Igbo spatial planning systems in which residential and commercial purposes are integrated to harmoniously operate side-by-side to each other. However, currently, most urban neighborhoods are designed in street forms rather that as clusters (nucleated settlements). In this case, since the existing housing models are already in street forms instead of the typical nucleated settlements, let the streets be used as

equivalents of the various nuclear settlements. Thus, let the masterplan reflect a calculated proportion of residential houses and shops which can be created on each street such that people would not have the need to convert existing residential spaces into commercial use, thereby distorting the masterplan and creating chaos which evolves into slums. This thesis proposes that the proportioning of neighborhood shops with residential units can be a minimum of one shop per every 30 households. This will allow more people to interact through the central facilities. Even though reducing travel distance is part of the aims, making less households per shop (say one shop to 15 households) might separate people a lot and may also cause a possible underutilization of the facility as they may stay moribund owing to irregular usage. Other services such as restaurants shall be provided alike. This would connect better with the people who find hard time adapting to the monotonous flocking of residences together and separating them from one big lone shopping center. Also, it will minimize the occurrence of change of use because such planning scheme would have addressed their quest for familiar system of living – hence vernacular architecture (see fig 75). *"Vernacular architecture can be defined as a type of local or regional construction, using traditional materials and resources from the area where the building is located. Consequently, this architecture is closely related to its context and is aware of the specific geographic features and cultural aspects of its surroundings, being strongly influenced by them. For this reason, they are unique to different places in the world, becoming even a means of reaffirming an identity"* (Ghisleni, 2020).

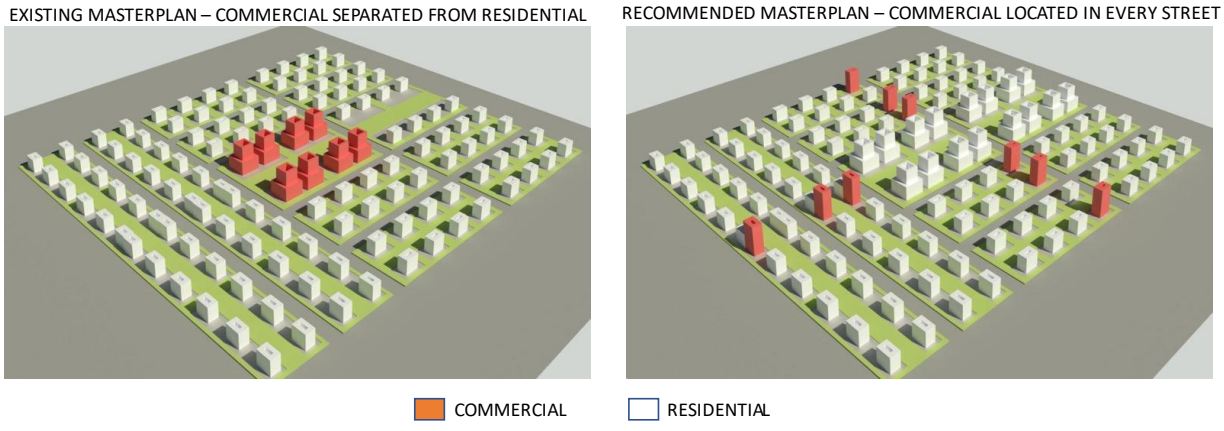

Figure 75: recommended modification for estate masterplans in Nigeria (Author, 2023)

7.3 To address poor management

In this research context (expert data), poor management results in poor documentation/non-documentation of properties, unapproved change of use, alteration of design by the occupants, inadequate inspection of the properties, and non-repair of damages. The non-experts validated this opinion by indicating that about 66% of the households have either cracked walls or leaking/damaged roofs. These damages grow and stay unrepaired because there is no regular monitoring of the estates to detect damages, leaving most damages unrepaired. Also, through observation during the field visit, it was observed that some occupants erected additional structures such as shops, fences/gates, changed their paints or totally remodeled their housing units. These unapproved alterations and additional structures thrived because the monitoring is poor, and the enforcement of sanctions is weak (based on expert data – chapter 2). Hence, over time, the estates lost their design harmony because of unorganized changes occurring in them, leading to slum emergence in extreme cases. However, based on chapter 4 of this thesis, there is no record of housing stock in the existing government housing estates. Hence tracking those observed alterations and damages is difficult. The next sections, discusses accurate property data inventory and participatory monitoring can help in minimizing incidents of illegal design alteration and address poor management.

7.3.1 Accurate Property Data Inventory

The first step towards managing assets is knowing their quantity, location, and other vital information about those assets. During the field data collection, a request was made to obtain a list of housing estates under the Enugu state government, their years of completion, and the number of housing units (households) in each estate. Also requested for were the respective masterplans of those estates to have a visual impression of the initial design concept. Thanks to the head of estate department (Enugu State Housing Corporation) – copies of some of the masterplans were provided. Also, a complete list of estates, their years of completion, names of their host-communities, but not the accurate number of housing units (households) therein was provided. Therefore, using only accessible information, number of land parcels in each estate was used in lieu of the number of housing units to plan the survey data collection. However, although the list of estates was available, it was handwritten. Hand-writing the list of government housing estates in Enugu and adding all other information such as location, years of construction and number of parcels took about 3 weeks to complete because they were not readily available but were only prepared on request. Furthermore, despite having names of

communities where those estates are located, there were no location coordinates to identify them in case anybody needed to visit such places independently. Thus, a request for guided tours to those locations was made. This was to pick the respective coordinates of those estates using a GPS device. Important to note is that the documents received were paper based, ageing and defacing. Hence, some important details may soon be lost if not salvaged immediately. Using all the information gathered as described above, a list of all the government-owned estates in Enugu state was developed. This list also shows number of plots, location/host-communities, georeference/coordinates, and year of completion (see chapter 4 – section 4.3.2). Furthermore, using those GPS coordinates which were picked, a map of Enugu urban showing all those estates in one view was created (see chapter 4 – section 4.3.6).

Therefore, this thesis recommends that the government should use the map which this thesis developed, together with the complete list of estates which was also developed during this thesis (see fig 20 and table 5). The advantage of using this new map and the list of estates which this thesis developed is that they are digitally editable, reproducible, and protect documents from total damage and loss as experienced in the hard copy mediums existing currently. Also, the map as well as the list of estates can be updated if something changes (say, new development or need to correct errors) without the need to start off a new map or estate inventory project. Another advantage is that the map and the list of estates are in digital forms and can be safely stored or shared across devices.

7.3.2 Participatory Monitoring

Borrowing from the experts' views on management (chapter 5 – section 5.2.3), all the private developers who were interviewed indicated that they engage the estate occupants in the monitoring of the properties and reporting problems when spotted. They also form neighborhood associations through which occupants meet regularly to discuss issues concerning their estates and to suggest solutions to address their problems. Through this, occupants feel regarded and appreciated, hence, their motivation to support the progress of the estates.

Therefore, this section recommends that the government should involve the occupants in monitoring and reporting of problems in their estates. This will make information sharing effective and reporting time shorter, provided that the response is swift. To successfully engage the occupants in estate monitoring and reporting, the occupants should be assured of their anonymity when they report. This is to protect the reporter from possible security threats for

reporting a co-occupant. One way of ensuring anonymity is using a click-and-send mobile app (digital) or use of phone calls and letter boxes (almost analogue). However, there is a possibility of abuse of anonymity through false reporting by some occupants because of the guaranteed anonymity. Thus, there should be a penalty for false reports. Therefore, for every anonymized report, there should be a code identifier only decodable by the estate management if an investigation is required. Through this, a false reporter can be identified and penalized if necessary.

7.4 To address loopholes and poor/non-implementation of the housing policy

In chapter 3 (section 3.2), the Nigerian housing policy was reviewed. Resulting from the review, this research concluded that there are loopholes and poor/non-implementation of Nigerian housing policy. A significant loophole noted in the Nigerian housing policy review was non-implementation of 50% of housing stock in the rural area. Another significant loophole is the non-binding nature of the Nigerian housing policy. Hence, there is poor/non-implementation of the Nigerian housing policy directives. Therefore, sections 7.4.1 and 7.4.2 address the solutions recommended to address loopholes and poor/non-implementation of the Nigerian housing policy.

7.4.1 Rural Mass Housing Development

Literature review in chapter 2 (section 2.3) established that rural-urban migration contributes to rapid formation of slums in the urban area as the surging migrants into the urban areas seem to outnumber the housing supply in the urban. This extends to imply that some affordable housing schemes, despite being properly developed to meet the current urban population, would soon be overrun by the surging rural immigrants who constantly move into the city to settle there permanently. “It therefore makes little sense to embark on massive development of low-income housing and upgrading of squatter settlements in urban areas, if the population influx from the rural areas would turn these houses into slums due to over-crowding” (Wangaruro, 1988). Therefore, to keep the rural immigrants regulated from trooping into the urban in such large droves, there should a housing scheme designed and developed in the various rural areas (especially the rural areas nearest to the cities). This would decongest the urban area and protect most housing schemes from aggressive overuse and degeneration into slums.

Therefore, this thesis recommends that every government periodic housing schemes should apportion about 50% percent of the housing stock to the rural areas. Chapter 2, section 2.8.3 (ii) of 2012 Nigerian housing policy already requires the government to ensure that "at least 50 percent of the new homes are built in the urban centers and the remaining in the rural areas". Therefore, all that is required here is to implement this policy provision. To ensure that the rural housing developments succeed, the government should site some of its industries and institutional facilities in the rural areas to attract people. Otherwise, building houses in the rural areas and hoping that the people will move in will not work because there are no guaranteed means of livelihood nearby. Examples of institutional facilities include universities, hospitals, production plants, and good transportation network. Then, naturally, some people who wish to work in those facilities would seek housings close to those facilities. Some of them would later bring along their families and the community would gradually become alive while reducing pressures on the urban areas. This does not suggest urbanizing every rural area – it is rather about making rural living attractive – ruralisation (Chigbu et al., 2016).

7.4.2 Audit the Implementation of Nigerian Housing Policy

As indicated in chapter 3 (section 3.3.4) and chapter 6 (section 6.14) of this thesis, the Nigerian housing policy is not legally binding on anybody to follow. It is rather a set of guidelines recommended for implementation to achieve housing delivery. This implies that there are no sanctions incurred for not following the housing policy. Likewise, there are no incentives for implementing the housing policy too. Also, there is no known framework for determining (audit) the extents of compliance or deviations from following the housing policy.

Therefore, this thesis recommends that there should be schedules of audits to inspect compliance or non-compliance of developers (private and government) with the Nigerian housing policy. These inspections should occur in three stages – the first stage should be during the planning and design phase of the housing schemes, the second stage should be during construction, while the third stage should be after 3 years of completion. The import of 3 years after completion is that in standard project practice (including Nigeria), clients can withhold about 5% to 10% of the contractor's fee for an agreed period (3 years or more) post construction to ensure (through usage) that the construction was properly done before a full payment is made (Gamage, 2019). This 5% to 10% withheld by the client for the 3 years period is called retention fee. The government can also take advantage of this retention period to further evaluate policy

compliance in housing schemes. Outcomes of their evaluation can be used in determining if the developer deserves incentives or sanctions.

7.6 Synopsis

This chapter acknowledged (based on data collected/analyzed) that the surveyed existing government housing estates in Enugu were products of poor planning, poor management, and loopholes/poor implementation of housing policy. By acknowledging the above pitfalls in the surveyed affordable housing schemes in Enugu, this chapter recommended that the government's developers should address poor planning by (1) developing co-financing schemes that allow both cost sharing and separate ownerships within a single land parcel/plot, (2) reforming the existing incremental housing scheme by creating prototypes that self-developers must comply with to avoid design alterations that deface the estates, and (3) regulating arbitrary erection of shops/change of use by decentralizing the location of shops/non-residential buildings such that smaller clusters of neighborhoods can have shops designated to them to reduce total dependence on a single central shopping area by all the occupants of an entire estate. Furthermore, poor management can be addressed by (1) keeping accurate property data inventory as reference for measuring and quantifying maintenance and costing, and (2) involving the occupants in monitoring and reporting of breakdowns/damages in properties to ensure timely detection and repair to forestall larger-scale damages in the housing estates. Additionally, loopholes in the housing policy can be addressed by: (1) ensuring that 50 percent of the housing units planned in each scheme should be built in the rural areas (as already stated in the Nigerian housing policy) to reduce pressure on the limited decent urban housing available, and (2) by rewarding developers who comply with the housing policy and penalizing those who do not comply with the housing policy.

Chapter 8: Conclusion and Recommendations

This thesis investigated if the existing government affordable housing schemes in Enugu, Nigeria, are turning into slums; what caused the slum emergence and recommended solutions to the problem.

8.1 Conclusion

Chapter 2 addressed research question 1 (How are affordable housing and slum emergence conceptually connected?). On the other hand, chapters 3, 4 and 5, built the underpinning upon which research question 2 could be answered. Then, chapter 6 addressed research question 2 (What are the deficiencies in affordable housing schemes in Enugu and how do they lead to the emergence of slums?). Furthermore, chapter 7 addressed research question 3 (How can slum-proof housing schemes be used to improve the housing challenges in Enugu?). Having addressed all the research questions in the previous chapters, this section captures all the answers to deliver a synoptic image of the findings of this research.

Based on literature findings, the conceptual link between slum and affordable housing (decent) is low income. This is because apart from desperate circumstances such as urgent shelter or escape from danger, both those who seek slum housing and those who seek decent affordable housing are driven by their low incomes. Additional to low income, there is a cyclic relationship between slums and affordable housing – from one direction, decent affordable housing can turn into slum; and from the other direction, slums can be rebuilt into decent affordable housing. Therefore, primary data collection (both expert and non-expert) focused on finding out if the study area has turned into slums and/or if the houses are affordable, their extents and their causes. Furthermore, because the housing schemes under study are government housing developments, an analysis of the Nigerian Housing Policy was done to check how the housing policy addressed affordability and slum prevention.

Expert data analysis revealed that the existing government affordable housing schemes are unaffordable to the low-income people and are turning into slums, while most of the occupants have high tenure insecurity. Tenure insecurity can occur because of slum. This is because people tend to exit from decaying/dilapidating properties for safety, cutting short their stay in that property, thereby increasing their instability. The experts ascribed these three pillars of housing unaffordability, slum emergence, and tenure insecurity to poor planning and poor management. For poor planning, housings being delivered lack proper zoning and are priced

high such that the low-income people cannot afford them. Therefore, those who cannot afford to buy the houses resort to renting from the few who could buy (Obiefuna, 2012). This subjects the tenants to high tenure insecurity as they have no stability. For poor management, the government could not monitor their properties to protect them from slums.

On the other hand, results of the non-expert data analysis align with those of the experts. They suggest that the housing in the study area is also unaffordable to the low-income people and are turning into slums. Just as decaying properties (slum) increases tenure insecurity, housing unaffordability also increases tenure insecurity. When the housing is unaffordable, there is lower home ownership and higher number of tenants – tenants have less stability as they can exit the property any time either forcefully or willingly. Due to their unaffordability to the low-income people, the rich buy up the houses and rent them to the low-income people. The low-income people who live as tenants feel no sense of responsibility to maintain the houses adequately to avert damages and slum emergence. From another perspective, the non-experts ascribe slum emergence to insufficient space which is evident in: (i) lack of recreational center and no green areas for relaxation and (ii) the omission of certain services/utilities such as drainage channels and water supply in the delivered housing estates.

From a policy perspective, there are loopholes in the Nigerian Housing Policy as well as poor/non-implementation of the policy by the implementing stakeholders. The cardinal loophole is that the Nigerian housing policy is not legally binding but rather a recommended set of guidelines. Therefore, it is not compulsory and there are no legal consequences for not adhering to the policy guidelines. The non-compulsory or voluntary nature of the Nigerian policy further leaves a room for its non-implementation or poor implementation. Hence, there is little no attention to affordability or slum prevention.

Collating the standpoints of the experts, the non-experts, and the policy analysis, this research concludes as follows:

1. Nigerian housing policy could not guarantee improvement in housing affordability and slum prevention.
2. Causes of slum and housing unaffordability in the study area can be grouped into policy and technical problems. The policy problem refers to the loopholes in the policy while the technical problem refers to issues to issues arising from poor housing design, construction, and management.

3. Tenure insecurity is critical as it occurs both when housing is unaffordable and when housing is decaying. When a housing is turning into slum (especially dilapidating), occupants tend to seek ways out of the property in search of safety. Likewise, when housing is unaffordable fewer people own homes while more people live as tenants with less occupancy stability.

8.2 Contributions of this research to science and the society

This research recommended solutions required to address housing unaffordability and slum emergence from decently built housing schemes in Enugu. Those solutions further contributed to the improvement of knowledge in science and impact in the society. In the science community, the knowledge which this research developed are transferable, the procedures are measurable, and the opinions have opened a new debate paradigm in the built environment. On this research's impact on the society, solutions recommended in this research will ensure slum prevention through good facility management, and culture-responsive planning and design thinking. Jointly, the contributions of this research to science and the society have further addressed some aspects of the sustainable development goals (SDG's) – visit: https://sdgs.un.org/goals for more details. In particular, this research has addressed Goals 6 and 11. While goal 6 of the SDG talks about "clean water and sanitation", goal 11 talks about "sustainable cities and communities".

8.2 Recommendation for future research

Although this research aimed to contribute solutions to problems surrounding affordable housing and slum emergence, the solutions in this thesis are not exhaustive. Therefore, future research should be directed towards expanding on some of those untouched aspects of this research.

8.2.1 Method of home acquisition

In the research questionnaire, while hoping to understand which factors affect affordability and tenure security, questions about how the homeowners acquired their homes were included. Although, the responders indicated their various modes of acquisition, data analysis could not show any correlation of mode of home acquisition with other factors in the set of variables. However, there is hope that if further research is dedicated solely on how people acquired their

homes, there may be a clue to how that affects housing affordability, tenure security or slum prevention.

8.2.2 Development in phases

Among the summary of the expert interviews, it was noted that private developers indicated poor planning as one of the causes of slum emergence. They suggested that development in phases is one of the ways through which they tackled poor planning. However, the expert respondents could not explain further how they applied development in phases. On the other hand, development in phases has also been applied in some of the existing government-owned housing estates in Enugu but seemed unsuccessful as there can be found in them some instances which conform to this study's conceptualization of slum. A known instance of development in phases among the government-owned housing estates in Enugu is Trans-Ekulu housing scheme (phases 1 – 6). It is important to note that development in phases, just as incremental housing, requires building gradually. However, the difference is that while incremental housing addresses just the housing units, development in phases focuses on the entire land layout (estate masterplan). Thus, in the context of an entire estate layout, it implies development of neighborhoods in phases until every land parcel is put into effective use. Considering that this research could not understand how the private developers succeeded with development in phases, it is difficult to recommend it a planning solution to address slum emergence. Therefore, further research should focus on understanding efficient ways of conducting development in phases to prevent slum emergence in government housing schemes.

8.2.3 Public sensitisation about Nigerian Housing Policy through translations into local languages

Considering that the Nigerian housing policy is not legally binding, people may not be interested in it no matter how great its contents may be. Therefore, a second chance towards making the Nigerian housing policy effective is by mass public sensitisation about its benefits. This might lead to a renewed enthusiasm into embracing and implementing the housing policy. The Nigerian constitution recognises other local languages and goes on to suggest that a state parliament can hold its sessions in any local language preferred by members of such state assembly. For more details, see the Nigerian constitution (chapter 5, part 2, section B, no. 97). However, the Nigerian housing policy was written only in English language. This suggests that with a literacy rate of merely 62.2% (Macrotrends, 2023), about 37.8% Nigerian population may not be able to understand the contents of the housing policy because they are not written

in their familiar languages. Therefore, future research should investigate the best far-reaching languages that can effectively publicize the Nigerian housing policy. Sequel to this recommendation to translate the policy into local languages, this thesis has thus, been translated into Igbo language such that it can also be widely read by the Enugu people and other nearby states whose native language is Igbo (see figure 76).

Technical University of Munich
TUM School of Engineering and Design

Ụlo a Rụrụ Maka Ndị Nwere Obere Ego Abụrụgo Ụlọ Apịtị: K' Anyị Nyocha Ihe Kpatara ya, Ihe Ndị O Mebiri, Ka-e Nwee Ike Ikpochapụ Ya Bụ Nsogbu n' Enugwu nke Nigeria

Anthony Ikechukwu, Agboeze

Ndị isi agụm akwụkwọ mpaghara nka n' ụzụ nke Technical University of Munich nabatara edemede a maka echichi nzere mmụta nke Doctor of Engineering (Dr. Ing).

Onye Isi Ule akwụkwọ: Prof. Dr. rer. pol. habil. Bing Zhu

Ndị osote Onye Isi Ule akwụkwọ:

1. Prof. Dr. Ir. Walter Timo de Vries
2. Assoc. Prof. Dr. -Ing Eugene Uchendu Chigbu

E tinyere edemede a n' aka ndị isi ụlọ akwụkwọ mahadum nke Technical University of Munich n' ụbọchị 17/05/2023 ha wee nyefee ya n' aka ndị mpaghara nka n' ụzụ ya bu ụlọ akwụkwọ n' ụbọchi 05/09/2023.

Figure 76: sample cover page of Igbo translation of this thesis (Author, 2023)

8.3 Limitations

Despite the ambitious wishes of this research, not all the wishes and expectations were realized. The major inhibiting factor which affected the non-realization of some of the expectations are insufficient/missing data and insufficient time for the data collection. Also, there are not much existing research on the issues of slum emergence from the government housing schemes in Enugu, Nigeria.

An instance of insufficient/missing data was that in research proposal which led to this research, there was a plan to survey households in the study area using household data which would be obtained from any government department in charge of housing development and delivery in Enugu. However, during the field data collection, accurate number of housing units in the estates under survey could not be accessed because their records were not available. This led to an adjustment in the sampling method to be able to progress in the study. Therefore, household survey in this study was based on the number of parcels of land in each estate which does not equate to number of households, but it was used anyways.

Furthermore, for expert interview, the plan was to interview three private developers and three experts from three government departments who are involved in housing development and delivery in Enugu. However, three private developers were interviewed, but only one government developer could be interviewed because the others could not be reached within the data collection timeframe.

On the other hand, as a study project bound by deadlines, the period which was planned for data collection coincided with the COVID-19 pandemic lockdown spree across the globe. There were travel restrictions in Germany and there were same in Nigeria. Because of the travel restriction, travelling to meet the proposed expert respondents on the initially scheduled dates was not possible. After the lockdown was released, it became difficult to reschedule a new meeting with the proposed respondents. Although phone call or video interviews were alternatives, the respondents preferred physical meetings over virtual meetings because of their need to physically verify their interviewer's identity before granting any interview to them. Likewise, there was not enough time to source for new respondents. Sequel to this difficulty to travel or interview the government respondents virtually, only those who could be accessed within the limited time allotted for data collection were interviewed.

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Appendix: selection of some masterplans of government-owned housing estate in Enugu

Figure 77: masterplan of Palm Beach estate, Nsukka

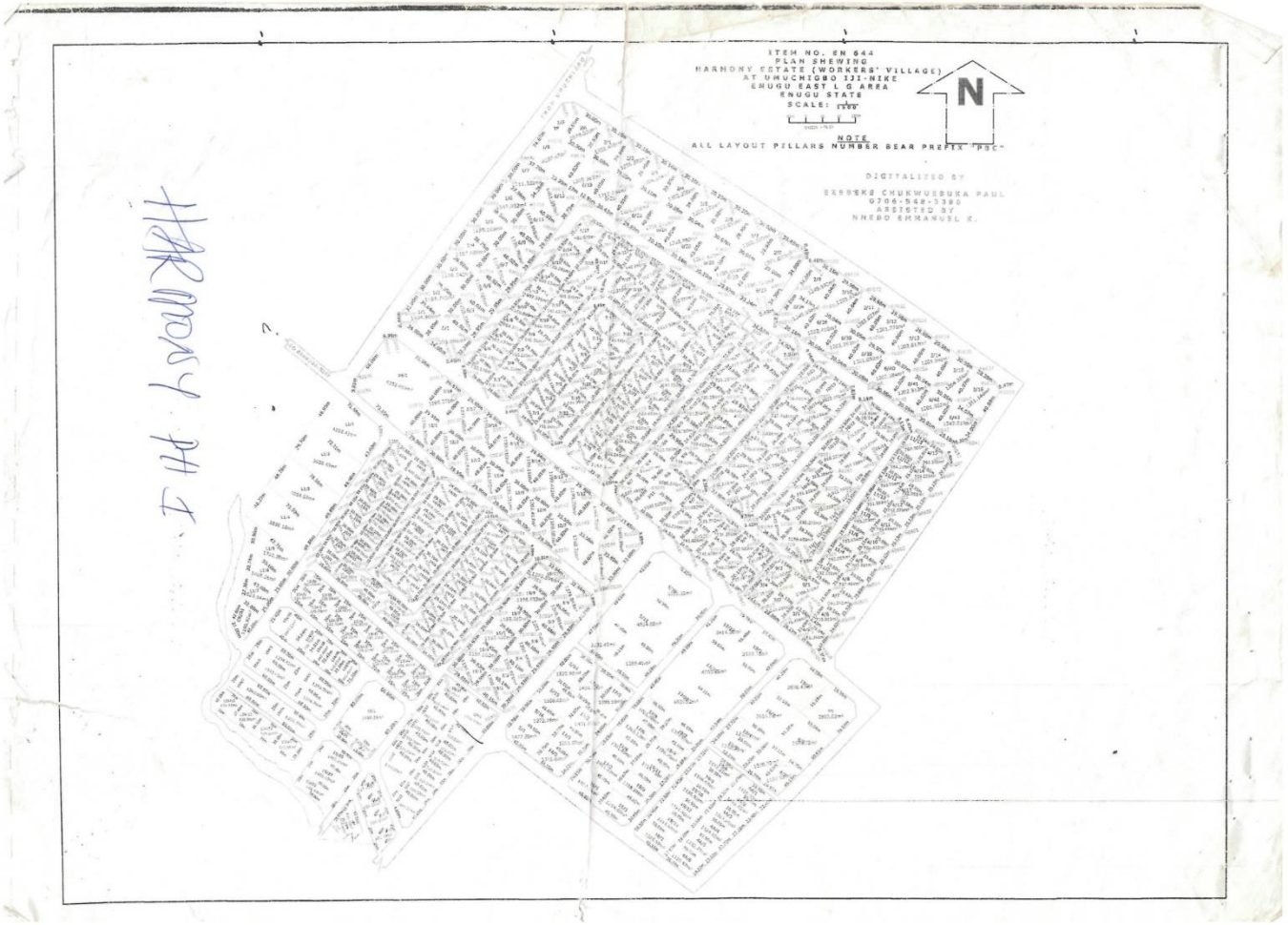

Figure 78: masterplan of Harmony Estate (phase 1), Umuchigbo, Nike

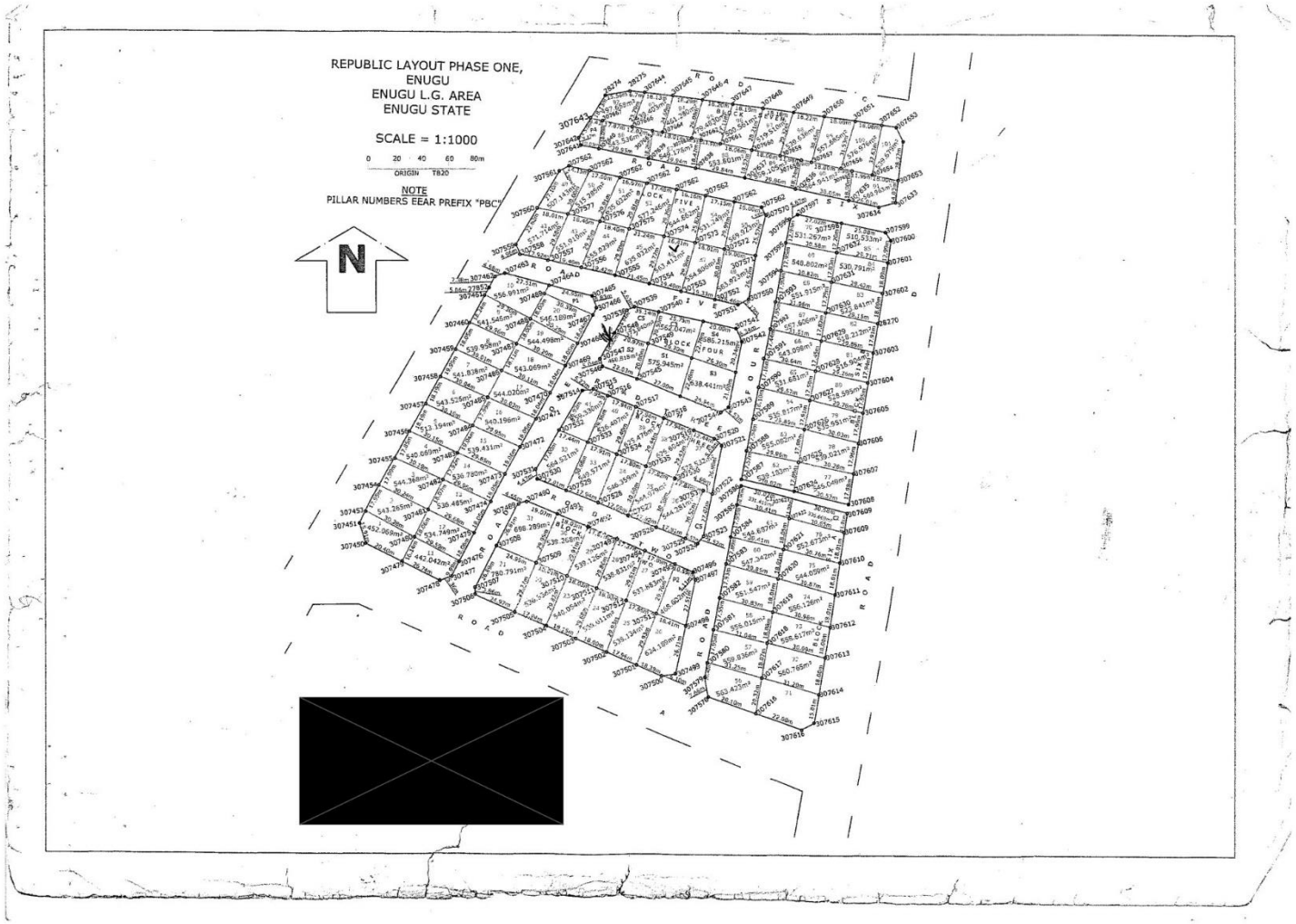

Figure 79: masterplan of Republic Layout estate (phase 1), Independence Layout, Enugu

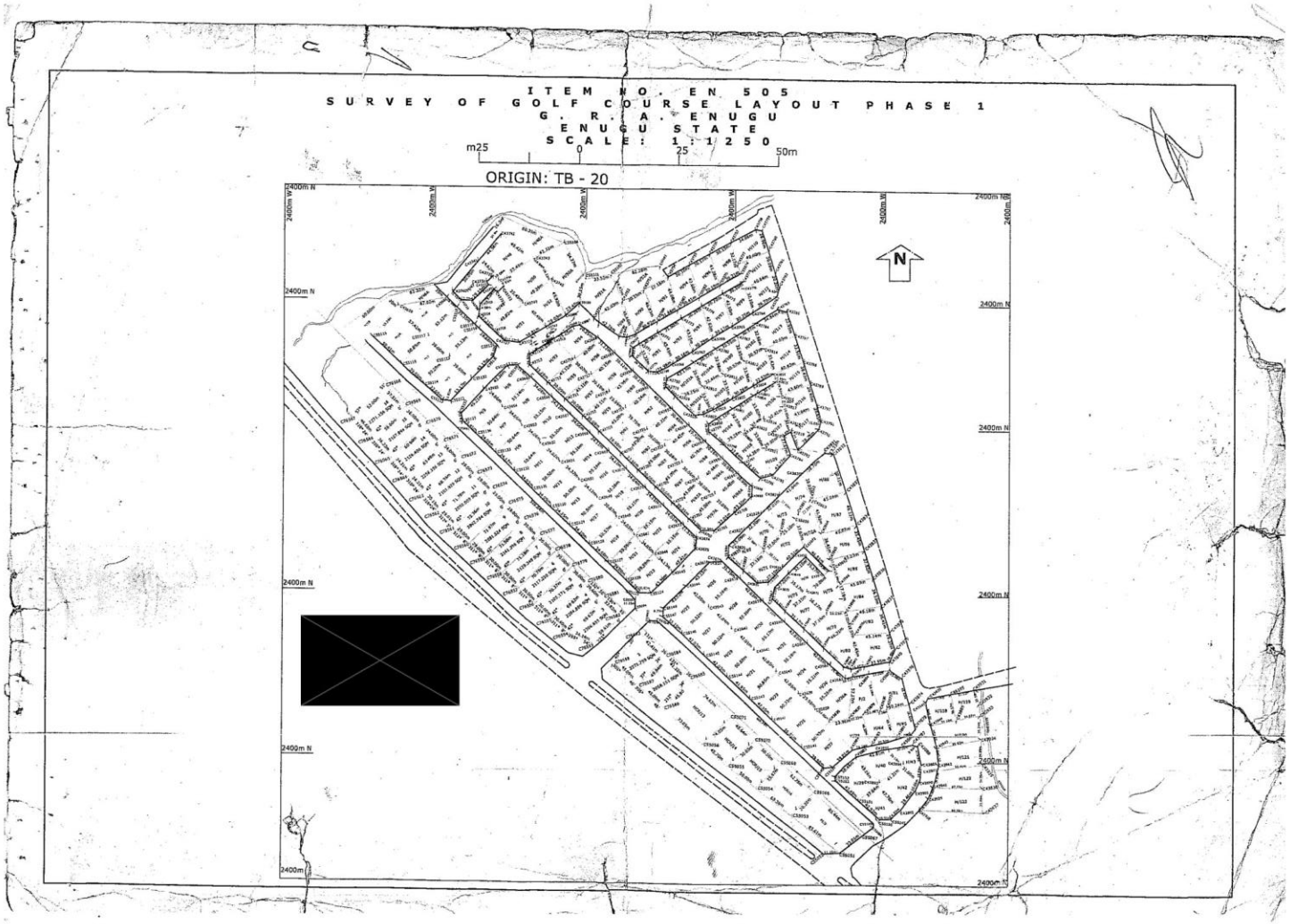

Figure 80: masterplan of Golf estate, GRA, Enugu

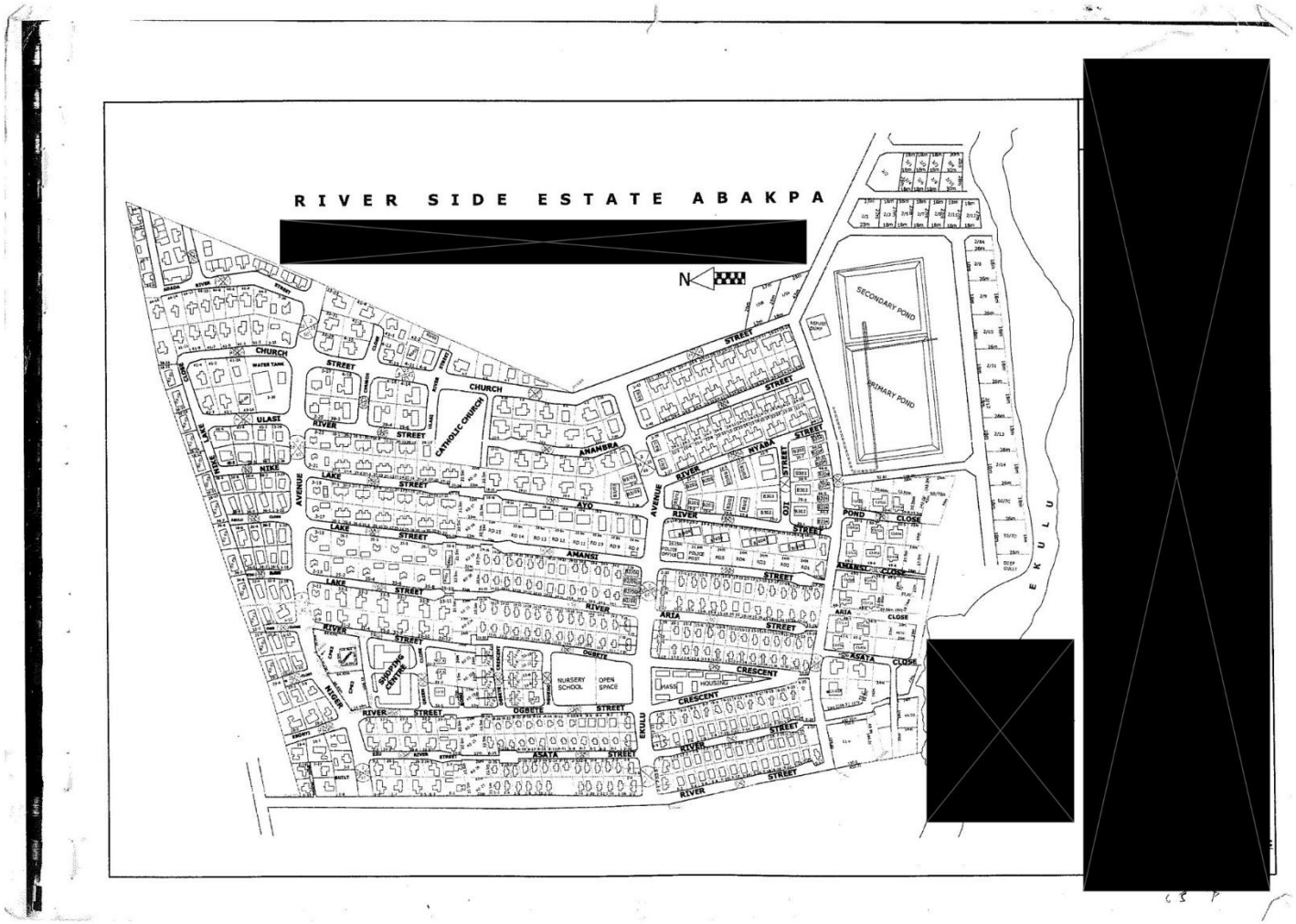

Figure 81: masterplan of Riverside Estate, Abakpa-Nike, Enugu