

**EXAMINING THE FACTORS THAT INFLUENCE RENTAL VALUES IN
IRREGULAR TOPOGRAPHICAL AREAS: A CASE STUDY OF
IGUODALOR AND IGUOSHODIN IN OVIA NORTH-EAST LOCAL
GOVERNMENT AREA, EDO STATE**

BY

**ADELEYE CLEMENT OSHOMOGUE
PGD/ENV/2415909**

**DEPARTMENT OF ESTATE MANAGEMENT,
FACULTY OF ENVIRONMENTAL SCIENCES,
UNIVERSITY OF BENIN, BENIN CITY**

DECEMBER, 2025

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ADELEYE CLEMENT OSHOMOGUE

PGD/ENV/2415909

SUPERVISED BY
PROF.P.S.OGEDENGBE

BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ESTATE
MANAGEMENT,FACULTY OF ENVIRONMENTAL SCIENCES,
UNIVERSITY OF BENIN,BENIN CITY,EDO STATE,NIGERIA
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE POST GRADUATE DIPLOMA (PGD) IN ESTATE MANAGEMENT

DECEMBER, 2025

CERTIFICATION

This is to certify that this project titled **“Examining the Factors that Influence Rental Values in Irregular Topographical Areas: A Case Study of Iguodalar and Iguoshodin Communities in Ovia North-East Local Government Area, Edo State”** was carried out by **Adeleye Clement Oshomogue (PGD/ENV/2415909)** and has been read and approved as meeting the requirements for the award of the **Postgraduate Diploma (PGD) in Estate Management** in the Department of Estate Management, Faculty of Environmental Sciences, University of Benin.

PROF.P.S OGEDENGBE
(Project Supervisor)

DATE

DR. M.O KOMOLAFE
(Head Of Department)

DATE

PROF. PAULINUS W. IHUAH
(External Examiner)

DATE

DEDICATION

This project is dedicated to Almighty God for His guidance, protection, and wisdom throughout the period of this academic pursuit. It is also dedicated to my parents, family members, and loved ones for their unwavering support, encouragement, and prayers.

ACKNOWLEDGEMENTS

I sincerely express my profound gratitude to Almighty God for granting me good health, strength, and wisdom throughout the course of this programme.

My heartfelt appreciation goes to my project supervisor, Prof. Peter S. Ogedengbe, for his invaluable guidance, constructive criticism, and professional advice, which contributed immensely to the success of this research.

I am equally deeply grateful to my Head of Department, Dr M.O. Komolafe, for his exceptional contributions to this project. His insightful guidance, thorough reviews, and unwavering support were instrumental in shaping the direction and quality of this work, complementing the supervision in a truly remarkable way.

I also extend my sincere thanks to all the lecturers in the Department of Estate Management, University of Benin, for their academic support and mentorship throughout the programme.

I acknowledge the cooperation of the respondents, including tenants, landlords, and Estate Surveyors and Valuers in Iguodolor and Iguoshodin communities, whose responses provided the primary data used for this study.

Finally, I appreciate my colleagues, friends, and family members for their encouragement, understanding, and moral support throughout the period of this study.

May God bless you all abundantly.

DECLARATION

I hereby declare that this project titled **“Examining the Factors that Influence Rental Values in Irregular Topographical Areas: A Case Study of Iguodolor and Iguoshodin Communities in Ovia North-East Local Government Area, Edo State”** is the result of my original research and has not been submitted in part or in full for the award of any degree, diploma, or certificate in this or any other institution.

Adeleye

Clement

Oshomogue

Signature:

Date:P

GD/ENV/2415909

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ABSTRACT

This study examines residential rental values and the factors influencing their variation in irregular topographical areas, using Iguodalar and Iguoshodin communities in Ovia North-East Local Government Area of Edo State as case studies. The study was motivated by observed disparities in rental values within areas characterised by uneven terrain, erosion challenges, drainage problems, and varying levels of accessibility. A descriptive survey research design was adopted. Primary data were obtained through structured questionnaires administered to tenants, landlords/developers, and Estate Surveyors and Valuers, while secondary data were sourced from relevant textbooks and journals. Out of 120 questionnaires administered, 112 were successfully retrieved and analysed. Data were analysed using descriptive statistics and multiple regression analysis. The findings reveal that rental values in the study area are significantly influenced by topography, accessibility, infrastructural provision, and environmental conditions. Properties located on stable, elevated, and accessible terrain with better infrastructure command higher rental values, while those situated on steep, erosion-prone, or poorly drained land attract lower rents. The study concludes that irregular topography plays a critical role in shaping rental value patterns and recommends improved infrastructure provision, erosion control measures, and the incorporation of topographical considerations into professional rental valuation practice.

.CHAPTER ONE

1.1 Background to the Study

Housing is universally recognised as one of the most fundamental human needs, ranking alongside food and clothing as a basic requirement for human survival and well-being. Beyond providing shelter, housing particularly rental housing plays a crucial role in shaping household expenditure patterns, social stability, labour mobility, and overall urban development (Aribigbola, 2010; Ibem & Aduwo, 2012). In both developed and developing economies, the rental housing market constitutes a significant segment of the real estate sector and serves as a major source of income for property owners and investors (Baum & Crosby, 2018).

In Nigeria, the housing sector is predominantly characterised by rental accommodation. This situation is largely attributed to high construction costs, rapid urbanisation, low income levels, limited access to long-term mortgage finance, and the persistent gap between housing demand and supply (Ayedun & Oluwatobi, 2011; Olayiwola, 2017). As a result, a substantial proportion of urban and peri-urban residents depend on rented residential properties to meet their housing needs. This has made the determination of residential rental values a critical issue in real estate practice, investment appraisal, and urban housing management (Babawale, 2013).

Rental value refers to the amount of money a tenant is willing to pay and a landlord is willing to accept for the use and occupation of a property for a specified period, usually on an annual basis. It is influenced by a wide range of factors, including

property characteristics, location, accessibility, availability of infrastructure, neighbourhood quality, environmental conditions, and prevailing market forces of demand and supply (Millington, 2015; Rosen, 1974). Rental values are not uniform across space; rather, they vary significantly from one location to another depending on the relative advantages and disadvantages associated with each area.

In recent decades, Nigeria has experienced rapid urban growth driven by population increase, rural-urban migration, and economic expansion. This growth has placed immense pressure on established urban centres, leading to the outward expansion of cities into peri-urban and previously undeveloped areas (Oduwaye, 2015). These peripheral settlements often exhibit challenging physical characteristics such as irregular topography, uneven land surfaces, steep slopes, poor drainage systems, erosion-prone land, and inadequate infrastructure provision (Fabiya, 2015; Udo, 2016). Despite these constraints, such areas continue to attract residential rental development due to relatively lower land prices and their proximity to major urban centres (Kukoyi & Fabiya, 2018).

Irregular topographical areas are characterised by uneven landforms including hills, slopes, valleys, depressions, and undulating terrain. These physical features significantly influence construction costs, road alignment, drainage patterns, infrastructure provision, accessibility, and environmental stability (Umeh & Onwuchekwa, 2017). Consequently, topography plays an important role in shaping the desirability of residential locations and the level of rent tenants are willing to pay. Properties located on stable, elevated, and well-drained land with good access tend to

command higher rental values, while those situated on steep slopes, waterlogged areas, or erosion-prone surfaces often attract lower rents (Ajayi, 2019; Eke, 2019).

Topography also affects tenants' perception of safety, comfort, and convenience. Areas that experience frequent flooding, erosion, or poor accessibility particularly during the rainy season are generally considered less desirable for residential occupation. This reduced desirability negatively affects rental demand and results in lower rental values (Iroham et al., 2014; Uwem, 2020). Conversely, locations within the same community that enjoy relatively favourable terrain and better infrastructure often record higher rental values, even where building types and structural quality are similar. This situation creates noticeable spatial variation in rental values within irregular topographical environments (Oni & Ajayi, 2018).

In Edo State, the expansion of Benin City has accelerated residential development in surrounding peri-urban communities, including Iguodolor and Iguoshodin in Ovia North-East Local Government Area. These communities have witnessed increasing population growth and rising demand for rental housing due to their proximity to the city (Ighalo, 2021). However, their physical environment is characterised by undulating terrain, erosion-prone surfaces, seasonal flooding in low-lying areas, and varying levels of road accessibility and infrastructure provision (Amadi & Ukoha, 2021).

Empirical observation within Iguodolor and Iguoshodin reveals significant differences in residential rental values between properties located on favourable terrain and those situated on difficult landforms. Properties on stable, accessible, and well drained land

tend to command higher rents, while those on steep slopes, poorly drained areas, or erosion affected land attract relatively lower rental values, even when the buildings are similar in size, age, and design. These observed disparities suggest that irregular topography and related environmental and infrastructural factors exert a strong influence on rental value determination in the study area (Adebayo, 2020; Omirin, 2010).

For Estate Surveyors and Valuers, a clear understanding of how irregular topography affects rental values is essential for accurate valuation and professional practice. Investors require reliable information on how terrain-related factors influence rental income and investment returns, while policymakers and urban planners need empirical evidence to guide infrastructure provision, land-use planning, and sustainable development in peri-urban areas (Babawale & Johnson, 2012; Baum & Crosby, 2018). Despite the importance of these issues, there is limited empirical research focusing specifically on rental value determination in irregular topographical areas within Edo State.

This study therefore examines residential rental values and the factors influencing their variation in irregular topographical areas, using Iguodalor and Iguoshodin communities in Ovia North-East Local Government Area of Edo State as case studies. By analysing the effects of topography, accessibility, infrastructural provision, and environmental conditions on rental values, the study seeks to contribute to valuation literature, enhance professional practice, and provide evidence-based guidance for investment and urban planning decisions.

1.2 Statement of the Problem

The determination of residential rental values is a critical aspect of real estate practice, investment decision-making, and urban housing management. Rental values are expected to reflect the relative advantages and disadvantages of property locations, physical conditions, accessibility, infrastructure availability, and environmental quality. However, in areas characterised by irregular topography, the accurate assessment of rental values becomes particularly challenging due to the complex interaction of physical, infrastructural, and environmental constraints.

In many Nigerian cities, rapid urbanisation, population growth, and rural-urban migration have led to the outward expansion of urban centres into peri-urban communities with challenging physical characteristics. Areas such as Iguodolor and Iguoshodin in Ovia North-East Local Government Area of Edo State are typical examples. These communities are characterised by uneven terrain, varying land elevations, steep slopes, erosion-prone surfaces, poor drainage conditions, and uneven road networks. Despite these constraints, increasing demand for affordable housing close to Benin City has continued to drive residential rental development within the area.

Empirical observation within Iguodolor and Iguoshodin reveals significant variations in rental values among residential properties that are similar in size, age, and building quality. Properties located on stable, elevated, and well-drained land with better road access tend to command higher rental values, while those situated on steep slopes, flood-prone, or erosion-affected terrain attract relatively lower rents. These variations

suggest that irregular topography and related environmental and infrastructural factors exert a strong influence on rental value determination in the study area.

However, despite the obvious impact of terrain-related conditions on rental outcomes, rental value assessments in these communities are often carried out using valuation assumptions derived from more physically uniform and well-planned urban neighbourhoods. This practice fails to adequately account for the specific effects of slope, elevation, drainage, accessibility, and environmental risk on rental values in irregular topographical settings. As a result, rental valuations may be inaccurate, inconsistent, or unrepresentative of actual market conditions.

The absence of empirical data on the extent to which irregular topography influences rental values poses challenges for key stakeholders. Estate Surveyors and Valuers may experience difficulties in providing reliable rental advice, investors may misjudge rental income potential, and tenants may be subjected to rental charges that do not reflect the physical and environmental realities of their locations. Furthermore, policymakers and planning authorities lack adequate evidence to guide infrastructure prioritisation, land-use planning, and environmental intervention strategies in such communities.

Despite the growing importance of peri-urban settlements with irregular terrain, there is limited empirical research specifically examining the influence of irregular topographical features on residential rental values within Edo State, particularly in Iguodolor and Iguoshodin. This gap in knowledge underscores the need for a

systematic investigation into rental values and the factors influencing their variation in irregular topographical areas.

This study therefore seeks to address this problem by examining residential rental values in Iguodolor and Iguoshodin and analysing the extent to which irregular topography, accessibility, infrastructural provision, and environmental conditions influence rental value variations. The findings are expected to provide empirical evidence to support accurate rental valuation, informed investment decisions, and effective urban planning in irregular topographical environments

1.3 Research Questions

To guide the study and ensure a systematic investigation, the following research questions were formulated:

- What is the pattern and level of rental values of residential properties in Iguodolor and Iguoshodin?
- To what extent do irregular topographical features such as slope, elevation, erosion, and drainage conditions influence rental values in the study area?
- What is the relative influence of accessibility, infrastructural provision, and environmental conditions on rental value variations in Iguodolor and Iguoshodin?

1.4 Aim and Objectives of the Study

1.4.1 Aim of the Study

The aim of this study is to examine rental values and the factors influencing their variation in irregular topographical areas, with particular reference to Iguodolor and Iguoshodin communities in Ovia North-East Local Government Area of Edo State, in order to provide empirical guidance for rental valuation, investment decisions, and urban planning.

1.4.2 Objectives of the Study

To achieve the above aim, the study seeks to:

1. Examine the pattern and level of rental values of residential properties in Iguodolor and Iguoshodin.
2. Assess the extent to which irregular topographical features such as slope, elevation, erosion, and drainage conditions affect rental values in the study area.
3. Evaluate the relative influence of accessibility, infrastructural provision, and environmental conditions on rental value variations in Iguodolor and Iguoshodin.

1.5 Justification of the Study

Irregular topographical conditions exert a significant influence on residential development patterns and rental market behaviour, particularly in peri-urban environments of developing countries. In Nigeria, rapid urban expansion has pushed residential development into areas characterised by uneven terrain, erosion-prone surfaces, poor drainage, and infrastructural inadequacies. Despite the growing reliance on rental housing in such locations, empirical understanding of how irregular topography affects residential rental values remains limited, especially within Edo State. This knowledge gap provides a strong justification for the present study.

In many peri-urban communities such as Iguodolor and Iguoshodin in Ovia North-East Local Government Area of Edo State, rental value decisions are often made without adequate consideration of terrain-related factors such as slope, elevation, erosion susceptibility, and drainage conditions. Estate Surveyors and Valuers frequently apply valuation assumptions derived from more physically uniform and well-planned urban neighbourhoods, which may not accurately reflect rental market realities in irregular topographical settings. This situation increases the risk of rental mispricing, valuation inconsistencies, and unreliable rental advice (Babawale, 2013; Millington, 2015).

The study is justified by its potential contribution to professional real estate practice. By empirically examining the extent to which topography, accessibility, infrastructural provision, and environmental conditions influence rental values, the study provides evidence-based insights that can improve rental valuation accuracy and

market analysis. Estate Surveyors and Valuers will benefit from clearer guidance on incorporating topographical considerations into rental assessments, feasibility studies, and investment appraisals (Baum & Crosby, 2018).

Investors and property developers also stand to benefit from the findings of this study. Understanding how irregular terrain affects rental demand and pricing will assist in making informed site-selection decisions, estimating realistic rental income, and evaluating the financial viability of residential developments in challenging environments. This is particularly important in peri-urban areas where construction costs are higher and rental risks are more pronounced due to environmental constraints (Ajayi, 2019; Adebayo, 2020).

Furthermore, the study is relevant to policymakers, urban planners, and local authorities responsible for land-use planning and infrastructure development. Empirical evidence on the relationship between topography and rental values can guide prioritisation of road construction, drainage improvement, erosion control, and other infrastructural interventions in irregular terrain areas. Such informed planning decisions can enhance neighbourhood desirability, improve housing quality, and stabilise rental markets in peri-urban communities (Udo, 2016; Oduwaye, 2015).

From an academic perspective, the study contributes to existing literature on rental value determination by extending empirical analysis to irregular topographical settings that are often under-researched. While several studies have examined rental values in planned urban neighbourhoods, few have focused specifically on the influence of uneven terrain within peri-urban communities in Edo State. By addressing this gap,

the study adds to the body of knowledge in estate management, valuation, and urban studies.

In summary, the justification for this study lies in its relevance to professional practice, investment decision-making, public policy formulation, and academic research. The findings are expected to enhance rental valuation accuracy, support evidence-based planning, and promote a better understanding of rental market behaviour in irregular topographical environments such as Iguodolor and Iguoshodin.

1.6 Scope of the Study

This study focuses on the examination of residential rental values and the factors influencing their variation in irregular topographical areas, using Iguodolor and Iguoshodin communities in Ovia North-East Local Government Area of Edo State as the case study. The geographical scope of the study is therefore limited to these two peri-urban settlements, which are characterised by uneven terrain, varying land elevations, erosion-prone surfaces, drainage challenges, and differing levels of infrastructure provision.

The study is confined to residential rental properties, with particular emphasis on commonly rented housing types within the study area, including tenement buildings, self-contained rooms, one-bedroom and two-bedroom flats. Commercial, industrial, and owner-occupied residential properties are excluded from the study in order to maintain focus and ensure consistency in rental value analysis.

In terms of subject matter, the study examines rental values as the dependent variable and analyses the influence of selected independent variables relevant to irregular topographical environments. These include topographical characteristics (such as slope, elevation, and landform), accessibility (road condition and ease of movement), availability of infrastructure (water supply, electricity, drainage, and road networks), environmental conditions (flooding, erosion, and general neighbourhood quality), and security considerations. Other possible determinants of rental values that fall outside these variables are not covered in this study.

The temporal scope of the study is limited to the current rental market conditions within the study area at the time of data collection. Rental values analyzed reflect prevailing rents paid by tenants during the study period and do not include historical rental trends or future rental projections.

Methodologically, the study adopts a descriptive survey research design and relies on primary data obtained through structured questionnaires administered to tenants, landlords, and estate surveyors operating within the study area. Secondary data are sourced from relevant textbooks, journals, published research works, and professional reports. Data analysis is restricted to descriptive statistics and appropriate inferential techniques used to determine the relationship between rental values and the identified influencing factors.

By clearly defining these boundaries, the study ensures depth of analysis, relevance of findings, and practical applicability of results within irregular topographical residential environments such as Iguodalar and Iguoshodin.

1.7 Study Area

The study area comprises Iguodolor and Iguoshodin communities, both located within Ovia North-East Local Government Area of Edo State, Nigeria. Ovia North-East Local Government Area lies within the southern part of Edo State and forms part of the peri-urban fringe of Benin City, the state capital. The Local Government Area shares boundaries with Egor and Oredo Local Government Areas to the north, Ikpoba-Okha Local Government Area to the east, and Ovia South-West Local Government Area to the south.

Iguodolor and Iguoshodin are strategically located along major access routes linking Benin City to surrounding rural settlements. Their relative proximity to Benin City has made them attractive locations for residential development, particularly rental housing, as residents seek affordable accommodation outside the high-rent core urban areas. This has resulted in rapid population growth and increased demand for residential rental properties within the communities.

Physically, the study area is characterised by irregular topography, marked by undulating terrain, varying land elevations, gentle to steep slopes, and low-lying areas susceptible to erosion and seasonal flooding. These topographical conditions influence road alignment, drainage patterns, construction processes, and accessibility within the communities. In some locations, poor drainage and erosion have negatively affected road quality and environmental conditions, especially during the rainy season.

The level of infrastructural development in Iguodalar and Iguoshodin varies across neighbourhoods. While some areas have access to motorable roads, electricity supply, boreholes, and basic drainage systems, other sections suffer from poor road networks, inadequate drainage, irregular power supply, and limited access to potable water. This uneven distribution of infrastructure contributes to variations in residential desirability and rental values within the study area.

The predominant land use in Iguodalar and Iguoshodin is residential, with developments consisting mainly of tenement buildings, self-contained rooms, and blocks of flats occupied largely by tenants. Commercial activities such as small shops, roadside trading, and neighbourhood services are present but play a secondary role. The dominance of rental housing makes the communities suitable for examining residential rental values and the factors influencing their variation.

Socio-economically, residents of the study area comprise low- and middle-income earners, including civil servants, artisans, traders, students, and private-sector employees who commute daily to Benin City and neighbouring areas for work. Rental values within the communities are therefore influenced not only by building characteristics but also by accessibility, neighbourhood conditions, infrastructural availability, and environmental quality.

The combination of rapid residential growth, irregular topography, varying infrastructure provision, and active rental housing market makes Iguodalar and Iguoshodin appropriate case study areas for examining the influence of irregular

topographical conditions on residential rental values in Ovia North-East Local Government Area of Edo State.

1.8 Limitations to the Study

In the course of carrying out this research, several limitations were encountered which, although not severe enough to undermine the validity of the study, should be acknowledged. These limitations include:

1. Inadequate and Unreliable Data Sources: There is an absence of comprehensive and updated rental records, cadastral data, and detailed topographical documentation for the study area. Much of the required information had to be sourced through oral interviews, questionnaires, and personal observation, some of which may include minor inaccuracies due to respondents' memory bias or estimation errors.

2. Respondent Hesitation and Limited Cooperation: Some landlords, caretakers, and tenants were initially unwilling to share accurate rental information, fearing that it might be used for taxation or regulatory purposes. This slowed down the data collection process and limited the sample size in certain clusters.

3. Time Constraints: The timeframe allotted for the completion of this PGD research restricted the depth of investigation that could be carried out. More extensive fieldwork, seasonal comparisons, and a larger sample size would have enriched the study but were not feasible within the available time.

4. Financial Constraints: Transportation costs and repeated visits to hard-to-reach areas of the communities posed financial challenges. These constraints limited the number of trips that could be made for field validation and data verification.

1.9 Layout of the Study

In accordance with standard academic research format, this study is structured into five chapters, each addressing specific aspects of the research problem.

Chapter One presents the introduction to the study. It covers the background to the study, statement of the problem, aim and objectives of the study, research questions, justification of the study, scope of the study, description of the study area, and definition of relevant terms. This chapter establishes the foundation and context for the research.

Chapter Two provides a comprehensive review of relevant literature related to residential rental values and factors influencing their variation, with particular emphasis on irregular topographical areas. The chapter examines conceptual issues, theoretical frameworks, and empirical studies relevant to rental value determination, accessibility, infrastructure, environmental conditions, and topography. It also identifies gaps in existing literature that justify the present study.

Chapter Three discusses the research methodology adopted for the study. It outlines the research design, population of the study, sample size and sampling techniques, sources of data, methods of data collection, research instruments, validity and

reliability of instruments, and techniques of data analysis. This chapter explains how data were collected and analysed to achieve the study objectives.

Chapter Four presents and analyses the data obtained from the field survey. The chapter includes descriptive analysis of respondents' characteristics, assessment of rental values within the study area, and statistical analysis of the factors influencing rental value variation in irregular topographical areas. Results are presented using tables and other appropriate statistical tools.

Chapter Five summarises the findings of the study and discusses their implications. It contains the summary of findings, conclusions drawn from the analysis, recommendations for Estate Surveyors and Valuers, investors, and policymakers, as well as suggestions for further research.

1.10 Definition of Terms

Accessibility: The ease with which a residential property can be reached from major roads, workplaces, commercial centres, and essential services, considering road condition, distance, and transportation options.

Building Characteristics: The physical attributes of a residential property, including size, design, age, construction quality, and internal facilities, which influence its rental value.

Drainage: The system for removing excess surface and groundwater from an area, including natural and artificial channels, which affects environmental quality and residential desirability.

Erosion: The gradual wearing away of land surfaces caused by water runoff, particularly in sloping areas, which can affect property stability, accessibility, and rental demand.

Estate Surveyor and Valuer: A trained and professionally qualified individual registered to carry out valuation, property management, and real estate consultancy services, including rental valuation.

Environmental Conditions: The physical and sanitary state of a residential neighbourhood, including flooding, erosion, waste disposal, noise levels, and overall environmental quality.

Infrastructure: Basic physical and organisational facilities that support residential living, including road networks, electricity supply, water supply, drainage systems, and waste management services.

Irregular Topography: A land surface characterised by uneven terrain, varying elevations, slopes, hills, valleys, and depressions, which poses challenges to development and influences rental values.

Neighbourhood Quality: The overall attractiveness of a residential area based on environmental conditions, infrastructure availability, security, and social characteristics.

Peri-Urban Area: A transitional zone located on the outskirts of a city, where urban and rural land uses coexist and where rapid residential development often occurs.

Rental Housing: Residential accommodation occupied by tenants who pay rent to landlords for the use of property for a specified period.

Rental Value: The amount of money a tenant is willing to pay and a landlord is willing to accept for the use and occupation of a residential property over a specified period, usually expressed on an annual basis.

Residential Property: A building or part of a building designed and used primarily for human habitation, including rooms, flats, and other dwelling units.

Slope: The degree of steepness or incline of land, which influences drainage, construction cost, accessibility, and residential rental value.

Topography: The physical configuration of land surfaces, including elevation, slope, landform, and natural features, which affect development patterns and rental values.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Preamble

This chapter presents a comprehensive review of extant literature germane to the determinants of residential rental values and their spatial variations within irregular topographical contexts, with particular reference to peri-urban settlements in Nigeria. The review integrates conceptual elucidations, theoretical foundations, and empirical investigations, placing emphasis on the interplay among topography, accessibility, infrastructural provision, and environmental conditions. Through this synthesis, the chapter establishes a coherent analytical framework for examining rental value dynamics in Iguodolor and Iguoshodin communities, Ovia North-East Local Government Area, Edo State, while addressing lacunae identified in Chapter One.

2.2 Conceptual Framework of Rental Value

Rental value denotes the periodic typically annual monetary consideration that a tenant is willing to remit and a landlord prepared to accept for the exclusive occupation and enjoyment of a residential property (Olayiwola, 2017; Baum & Crosby, 2018). It represents the economic quantification of a property's utility, derived from a composite of structural attributes, locational advantages, neighbourhood characteristics, and ambient environmental factors.

In Nigeria's peri-urban landscapes, marked by rapid urban expansion, constrained affordability, and heterogeneous physical morphologies, rental values manifest considerable heterogeneity (Adebayo, 2020). Irregular topography accentuates these variations by elevating development expenditures and diminishing locational appeal, thereby engendering intra-community rental differentials despite structural comparability (Ajayi, 2019). Empirical studies employing hedonic pricing models consistently demonstrate that locational and environmental attributes often proxy for topographic influences such as accessibility constraints, drainage inefficiencies, and erosion risks account for substantial portions of rental variance, with explanatory power frequently exceeding 60% (e.g., Egbenta et al., 2015; Odebode et al., 2024).

In communities such as Iguodolor and Iguoshodin—characterised by undulating relief, erosional vulnerabilities, and drainage inadequacies—topographical constraints synergise with infrastructural deficits to suppress rental premiums in susceptible zones (Popoola et al., 2015; Amadi & Ukoha, 2021). Recent investigations in peri-urban Nigeria further underscore affordability-driven migration to peripheral areas, where lower baseline rents are offset by environmental and access-related discounts (e.g., Ankeli, 2022; Gwamna & Yusoff, 2016). Hedonic analyses reveal that factors like proximity to amenities, road quality, and environmental stability (implicitly tied to terrain) exert significant positive or negative marginal effects on rents, with coefficients for infrastructure and neighbourhood quality often emerging as dominant predictors (Ajibola et al., 2022; Bello & Olatubara, 2014; Aluko, 2011).

This conceptualisation aligns with the hedonic pricing paradigm, wherein rental value decomposes into implicit prices for discrete attributes, enabling quantification of topographic externalities in irregular terrains (Rosen, 1974). In Nigerian contexts, such models have illuminated rental depressions of 20-40% attributable to terrain-mediated hazards like flooding and poor drainage in peri-urban settlements (Omirin, 2018; Udoekanem et al., 2014). Thus, rental value serves not merely as a market outcome but as a barometer of spatial inequities exacerbated by physiographic irregularities.

2.3 Concept of Property Value

Property value represents the estimated monetary worth of a real estate asset in an open and competitive market, reflecting the present worth of future benefits derivable from its ownership or occupation (Millington, 2015; Baum & Crosby, 2018). It is fundamentally rooted in the economic principle that value arises from the interplay of four primary agents: utility (the capacity to satisfy human needs), scarcity (relative limitation in supply), demand (effective purchasing power coupled with desire), and transferability (the ability to convey ownership rights legally and practically) (Appraisal Institute, 2020; Babawale, 2013).

In the context of residential properties, value manifests in two principal forms: capital value (the lump-sum price a property would fetch if sold) and rental value (the annual or periodic income stream from letting). Both are inextricably linked, as rental value often serves as a capitalisation base for estimating capital value through the income approach to valuation (IVS, 2022). The income approach posits that property value

equals the present value of anticipated future net income streams, discounted at an appropriate yield rate reflective of risk and market expectations (Baum & Crosby, 2018).

Within irregular topographical settings, these four agents of value are frequently distorted. Utility is diminished where steep slopes, poor drainage, or erosion proneness impair habitability, increase maintenance burdens, or restrict functional use (Udo, 2016). Scarcity may be artificially induced or alleviated depending on whether topographic constraints limit developable land supply or render certain parcels undesirable. Demand is tempered by tenants' and investors' risk aversion to environmental hazards and accessibility challenges, resulting in lower effective purchasing power for properties in vulnerable locations (Ajayi, 2019). Transferability can be indirectly affected through higher transaction costs or financing difficulties in high-risk zones perceived as less secure by lenders (Adebayo, 2020).

Empirical applications of these concepts in Nigerian peri-urban contexts reveal that environmental and locational attributes-proxies for topographic irregularities-consistently exert significant influence on realised property values. Hedonic studies demonstrate that factors such as flood risk, poor drainage, and slope instability impose substantial negative capitalisation effects, often translating to rental discounts of 15-40% and corresponding reductions in capital values (Omirin, 2018; Odebode et al., 2024). For instance, properties in erosion-prone peri-urban neighbourhoods exhibit lower capitalisation rates due to heightened perceived risk, necessitating higher yields to compensate investors (Babawale & Johnson, 2012).

Furthermore, the concept of highest and best use; legally permissible, physically possible, financially feasible, and maximally productive use of land becomes particularly constrained in irregular terrains (Boyce, 2014). Topographic limitations may preclude intensive residential development, forcing lower-density configurations and consequently depressing achievable value. In Iguodalar and Iguoshodin, where undulating landforms and gully erosion prevail, the highest and best use of many sites is compromised, leading to suboptimal value realisation compared to flatter, more accessible parcels nearby (Amadi & Ukoha, 2021).

In valuation practice, these conceptual underpinnings inform the three conventional approaches comparable sales, income, and cost each of which must account for topographic externalities. The comparable method requires careful adjustment for terrain differences; the income method demands risk-adjusted capitalisation rates; and the cost method incorporates elevated site preparation expenses (Millington, 2015). Failure to adequately reflect these influences risks systematic misvaluation, with implications for investment decisions, taxation, and urban planning.

Thus, understanding property value in irregular topographical contexts necessitates recognition that physiographic characteristics do not merely modify value, they fundamentally reshape the operation of utility, scarcity, demand, and transferability, producing spatially uneven value landscapes characteristic of peri-urban settlements like those under study.

2.4 Nature and Characteristics of Irregular Topography

Irregular topography refers to a land surface characterised by significant variations in elevation, slope, relief, and landform configuration, deviating markedly from flat or gently undulating terrain (Udo, 2016; Strahler, 2013). It encompasses features such as steep gradients, hills, ridges, valleys, depressions, escarpments, and dissected plateaus, often resulting from tectonic, erosional, or depositional processes over geological timescales (Amadi & Ukoha, 2021). In contrast to regular topography which facilitates uniform development and infrastructure deployment irregular topography imposes multifaceted constraints on land utilisation, particularly in residential contexts.

Key characteristics of irregular topography include:

1. **Variable Elevation and Slope Gradient:** Pronounced differences in height over short horizontal distances create steep slopes (typically >15-30%), rendering sites prone to instability and requiring extensive earthworks for stabilisation (Umeh & Onwuchekwa, 2017). In peri-urban Nigeria, slopes exceeding 20% significantly escalate foundation costs and limit buildable area.
2. **Erosion Susceptibility:** Steep gradients accelerate surface runoff, leading to sheet, rill, and gully erosion, especially in regions with intense seasonal rainfall like Edo State (Fabiya, 2015; NEWMAP, 2020-2024). Gullies or deep linear incisions compromise structural integrity, truncate access routes, and diminish land availability.

3. **Poor Natural Drainage:** Low-lying depressions and valleys act as convergence zones for stormwater, fostering waterlogging, seasonal flooding, and prolonged saturation (Eke, 2019). Conversely, elevated ridges may experience rapid runoff, exacerbating downslope erosion.
4. **Dissected and Undulating Relief:** Alternating highs and lows fragment developable land into isolated pockets, complicating road alignment, utility reticulation, and neighbourhood cohesion (Oduwaye, 2015).
5. **Soil and Geotechnical Variability:** Irregular terrains often exhibit heterogeneous subsoil conditions, expansive clays in valleys, shallow bedrock on ridges that necessitating site-specific engineering solutions and inflating construction budgets (Ajayi, 2019).

In the Nigerian peri-urban context, irregular topography is prevalent in the fringes of major cities such as Benin City, Lagos, and Enugu, where urban expansion encroaches upon previously undeveloped hinterlands (Kukoyi & Fabiyi, 2018; Ighalo, 2021). In Ovia North-East Local Government Area, the landscape is typified by undulating lateritic uplands interspersed with incised valleys and active gullies, a legacy of intense tropical rainfall on permeable but erodible soils (Amadi & Ukoha, 2021). Communities like Iguodalor and Iguoshodin exemplify these traits: elevated plateaus afford stable building platforms and superior drainage, commanding higher desirability, while adjacent lowlands suffer recurrent inundation and erosional retreat.

These physical attributes profoundly influence residential rental markets. Properties on stable, moderately elevated sites benefit from enhanced views, natural drainage,

and reduced hazard exposure, translating into rental premiums (Udo, 2016). Conversely, parcels on steep slopes or in depressions incur tenant aversion due to accessibility impediments (especially during wet seasons), higher maintenance burdens, and perceived safety risks, resulting in rental discounts of 20-40% relative to comparable units on favourable terrain (Omirin, 2018; Adebayo, 2020).

Empirically, hedonic studies corroborate these impacts. In Akure's hilly suburbs, slope and erosion variables exerted negative coefficients, depressing rents by 20-35% (Ajayi, 2019). Similarly, in Enugu's fringe areas, gully-proximate properties recorded sharp value declines attributable to topographic instability (Egbenta, 2015). Edo State's NEWMAP interventions (2020-2024) documented rental recoveries of 15-30% in stabilised gully corridors, underscoring topography's reversible yet potent influence when mitigated through engineering.

Thus, irregular topography does not merely constitute a passive backdrop; it actively shapes development feasibility, environmental risk profiles, and market perceptions, engendering pronounced spatial variations in rental values within peri-urban communities such as Iguodolor and Iguoshodin. Understanding these characteristics is indispensable for accurate valuation, sustainable planning, and equitable infrastructure allocation.

2.5 Theoretical Framework

The ensuing theoretical paradigms illuminate the linkage between topographical irregularities and rental valuation, offering lenses for analysing locational and environmental influences.

2.5.1 Bid-Rent Theory (Alonso,1964)

This theory postulates that land users tender progressively higher rents for sites proximate to central loci with minimal encumbrances. In topographically irregular settings, steep inclines and erosional disruptions impair accessibility, diminishing bidding capacity and yielding lower rental values, as observable in the peri-urban fringes of Iguodador and Iguoshodin.

2.5.2 Location Theory (Von Thünen, 1826; Weber,1909)

Locational value accrues from proximity to activity centres and inherent site advantages. Aberrant topography imposes barriers, eroding attractiveness and precipitating rental discounts for properties on challenging parcels.

2.5.3 Hedonic Pricing Model (Rosen, 1974)

The hedonic pricing model decomposes rental value into implicit contributions from discrete attributes structural, locational, neighbourhood, and environmental. Adverse topographical features (e.g., steep gradients, erosion susceptibility, drainage inefficiency) impose negative marginal imputations, while favourable elevations may

confer premiums. This econometric approach is particularly suited to isolating terrain effects in the present investigation.

2.5.4 Highest and Best Use Theory

This principle asserts that land achieves maximal value through its legally permissible, physically feasible, and financially viable use (Boyce, 2014). Topographical constraints restrict optimal residential deployment, curtailing income potential and rental yields in peri-urban irregular terrains.

2.6 Influence of Topography on Residential Rental Values

Topography exerts a profound and multifaceted influence on residential rental values by modulating construction feasibility, accessibility, infrastructural viability, environmental resilience, and tenant perceptions of risk and convenience (Udo, 2016; Ajayi, 2019). In Nigerian peri-urban contexts, challenging terrains engender rental reductions of 15-35%, attributable to heightened development costs, perceived hazards, and subdued demand (Adebayo, 2020; Omirin, 2018). In Edo State's distinctive geomorphology distinguished by undulatory landscapes and prolific gullies, these mechanisms precipitate marked intra-community rental disparities, mirroring conditions in Iguodolor and Iguoshodin and underscoring the necessity for topography-sensitive valuation practices.

The influence manifests through several interrelated pathways:

1. **Construction and Development Costs:** Irregular topography necessitates substantial site preparation retaining walls, deep foundations, terracing, and

extensive cut-and-fill operations-elevating capital outlays by 20-50% relative to flat sites (Umeh & Onwuchekwa, 2017; Fabiyi, 2015). Developers pass these incremental costs to tenants via higher rents where feasible; however, in affordability-constrained peri-urban markets, demand elasticity constrains rent escalation, resulting in net rental depression or protracted vacancy in difficult terrains (Kukoyi & Fabiyi, 2018).

2. **Accessibility and Mobility Constraints:** Steep slopes and dissected relief impede road construction and maintenance, yielding poorly aligned, unpaved, or seasonally impassable networks (Oduwaye, 2015). Tenants incur higher transport costs and time penalties, particularly during rainy seasons when erosion renders routes treacherous. Hedonic studies quantify this effect: proximity to motorable roads and gentle gradients command rental premiums, while slope-induced inaccessibility imposes discounts of 15-30% (Omirin, 2018; Olayonwa et al., 2018).
3. **Environmental Hazard Exposure:** Topographic features amplify risks of flooding (in depressions), soil erosion (on slopes), and landsliding (in saturated cuts). These hazards erode perceived safety and long-term habitability, prompting tenant risk aversion (Eke, 2019; Uwem, 2020). Empirical evidence from gully-prone southern Nigeria indicates rental abatements of 25-40% proximate to active erosion sites, with recovery observed post-stabilisation (Osagie, 2021; NEWMAP Reports, 2020-2024).
4. **Infrastructure Provision and Serviceability:** Undulating terrain complicates the economic deployment of utilities-electricity poles destabilise on slopes,

water mains require pressurisation in valleys, and drainage systems demand elaborate channeling (Adebayo, 2020). Resultant service intermittency or absence further depresses rental desirability, with studies showing infrastructure deficits linked to topographic complexity explaining up to 30% of rental variance (Bello et al., 2020).

5. Aesthetic and Psychological Dimensions: Elevated sites often afford panoramic views, natural ventilation, and prestige, conferring positive rental capitalisation (Millington, 2015). Conversely, low-lying or obscured parcels suffer perceptual downgrading. In peri-urban Benin City fringes, elevated plateaus attract middle-income tenants willing to pay 20-30% premia for these intangibles (Ighalo, 2021).

Cross-sectional hedonic analyses reinforce these causal links. In southwestern Nigeria, Odebode et al. (2024) reported negative coefficients for slope and drainage variables across multiple cities ($R^2 = 0.385 - 0.912$), with environmental conditions (including topographic proxies) exerting significant downward pressure. Similarly, in Calabar's undulating suburbs, flood-prone lowlands commanded markedly lower rents than upland counterparts (Udoekanem et al., 2014). Edo-specific insights from Benin City periphery reveal comparable patterns: properties in erosion-stabilised zones post-NEWMA P intervention appreciated 15-30% in rental yield, implying pre-intervention topographic penalties of similar magnitude (Efenudu, 2023).

Longitudinally, unmitigated topographic degradation exacerbates rental divergence over time. Gully advancement truncates access and threatens structures, inducing

progressive devaluation (Chinwokwu,2013; Nwachukwu,2018).Conversely,targeted interventions slope regrading, check dams, afforestation can reverse declines,highlighting topography's influence as malleable rather than immutable (NEWMAP Reports, 2020-2024).

In theoretical terms, this influence aligns with bid-rent gradients distorted by physiographic frictions (Alonso, 1964) and hedonic attribute pricing (Rosen,1974),wherein tenants trade off rent against terrain-induced disamenities. For Iguodolor and Iguoshodin as the prototypical of Edo's peri-urban irregular topography, these dynamics produce a mosaic of rental micro-markets: premium pockets on stable uplands juxtaposed against discounted enclaves in erosional lows. Accurate valuation thus demands explicit topographic adjustments, beyond conventional structural and locational comparables, to avert systematic mispricing and inform equitable urban planning.

2.7 Factors Influencing Rental Values in Irregular Topographical Areas

Rental values in irregular topographical areas are determined by a complex interplay of physical, locational, infrastructural, environmental, socio-economic, and market-related factors. In such contexts, topography does not operate in isolation but amplifies or mediates the effects of other determinants, often resulting in pronounced spatial variations within the same community (Ajayi, 2019; Adebayo,2020).The following subsections elucidate the principal factors, with particular emphasis on their manifestation and interaction in peri-urban irregular terrains like Iguodolor and Iguoshodin.

2.7.1 Topographical Factors

Topographical attributes are slope gradient, elevation, landform stability, erosion susceptibility, and natural drainage patterns can constitute primary influencers in irregular areas (Udo, 2016; Umeh & Onwuchekwa, 2017). Steep slopes escalate construction complexity and costs, while low-lying depressions foster flooding and waterlogging. Properties on stable, moderately elevated sites benefit from superior drainage, reduced erosion risk, and enhanced aesthetic appeal, commanding rental premiums of 20-35% over comparable units in challenging locations (Ajayi, 2019; Omirin, 2018). Hedonic models frequently assign significant negative coefficients to slope and erosion proxies, underscoring topography's direct depressive effect on rents (Odebode et al., 2024).

2.7.2 Accessibility and Transportation Networks

Accessibility is measured by road quality, proximity to major routes, and ease of movement ranks among the most salient determinants in peri-urban settings (Bello & Olatubara, 2014; Aluko, 2011). In irregular topography, steep gradients and erosional gullies exacerbate road degradation, rendering certain neighbourhoods seasonally inaccessible. Tenants prioritise motorable access for commuting to urban centres like Benin City, discounting rents in poorly connected zones by 15-40% (Omirin, 2018; Olayonwa et al., 2018). Empirical studies in Nigerian cities consistently identify accessibility as explaining 20-30% of rental variance, amplified in undulating terrains where topographic barriers compound infrastructural deficits (Ajibola et al., 2022).

2.7.3 Infrastructural Provision

Basic infrastructure like electricity supply, potable water, drainage systems, and waste management can be significantly enhances residential desirability and rental yields (Adebayo, 2020; Egbenta et al., 2015). Irregular topography hinders equitable infrastructure deployment: elevated areas may secure earlier electrification, while valleys suffer chronic drainage failures. Properties with reliable services command substantial premiums, with studies reporting positive marginal effects equivalent to 25-35% rental uplift (Bello et al., 2020; Udoekanem et al., 2014). In Edo peri-urban communities, uneven infrastructure distribution is often topography-mediated which explains much of the observed intra-community rental disparity (Ighalo, 2021).

2.7.4 Environmental Conditions and Hazard Risks

Environmental quality encompasses flooding propensity, erosion severity, air and noise pollution, waste disposal efficacy, and general neighbourhood sanitation (Babawale & Johnson, 2012; Odebode et al., 2024). In irregular terrains, these risks are heightened: depressions accumulate stormwater, slopes accelerate erosion, and gullies threaten structural stability. Tenants exhibit strong aversion to such hazards, imposing rental discounts of 20-40% in high-risk zones (Uwem, 2020; Osagie, 2021). Hedonic analyses reveal negative environmental coefficients as robust predictors, often rivaling structural attributes in explanatory power (Aluko, 2011; Egbenta et al., 2015).

2.7.5 Structural and Building Characteristics

Intrinsic property features are number of bedrooms, building age, construction quality, finishes, and amenities (e.g., bathrooms, tiling) remain fundamental determinants (Millington, 2015; Ajibola et al., 2022). However, in irregular topography, structural adaptations (e.g., reinforced foundations on slopes) inflate costs without commensurate rental recovery due to locational disadvantages. Studies show structural variables explaining 30-50% of variance in uniform terrains, but their influence diminishes relative to topographic and environmental factors in challenging sites (Odebode et al., 2024).

2.7.6 Neighbourhood Quality and Socio-Economic Attributes

Neighbourhood characteristics like security, social composition, proximity to schools/markets, and perceived prestige influence tenant preferences and willingness to pay (Bello & Olatubara, 2014). In peri-urban irregular areas, low-income households predominate, constraining rent levels despite demand pressure. Security concerns, often exacerbated by isolated topography, further depress values. Relative importance indices from stakeholder surveys rank neighbourhood quality highly, interacting multiplicatively with topographic risks (Aluko, 2011).

2.7.7 Market Forces and Economic Dynamics

Supply-demand equilibria, household income levels, urbanisation rates, and macroeconomic conditions modulate rental outcomes (Olayiwola, 2017). Rapid peri-urban influx increases aggregate demand, yet topographic constraints limit effective

supply of desirable units, creating segmented micro-markets. Inflation, interest rates, and alternative investment yields also affect capitalisation rates applied to rental streams (Baum & Crosby, 2018).

In synthesis, while multiple factors converge, irregular topography emerges as a pivotal mediator, intensifying the negative impacts of accessibility deficits, infrastructural gaps, and environmental hazards while attenuating the positive contributions of structural enhancements (Adebayo, 2020; Omirin, 2018). This multifaceted influence generates the pronounced rental variations observed in communities like Iguodolor and Iguoshodin, necessitating integrated analytical approaches in valuation and planning.

2.8 Empirical Review

Empirical studies on residential rental values have consistently demonstrated that rental variation is influenced by a combination of locational, physical, infrastructural, environmental, and neighbourhood factors. However, the extent to which irregular topography shapes rental values, particularly within peri-urban settlements in Edo State, remains under-researched. The following empirical studies are reviewed to establish existing knowledge and identify gaps addressed by the present study.

Ajayi (2019) examined the influence of physical and environmental factors on residential rental values in Akure, Ondo State. The study adopted a descriptive survey research design and utilised questionnaires administered to tenants, landlords, and estate surveyors. Data were analysed using descriptive statistics and regression analysis. The findings revealed that slope, elevation, drainage condition, and erosion susceptibility significantly influenced rental

values. Properties located on stable and elevated terrain attracted higher rents, while those situated on steep or erosion-prone land commanded lower rental values. The study concluded that topography is a critical determinant of residential rental values. Although the study established the relevance of topography, it was conducted in Akure and did not focus on peri-urban communities in Edo State, thereby limiting its applicability to the present study.

Omirin (2018) investigated factors influencing residential rental values in peri-urban areas of Lagos State. Using a cross-sectional survey design and hedonic pricing regression analysis, the study assessed the effects of accessibility, environmental quality, and neighbourhood characteristics on rental values. The results indicated that poor accessibility, inadequate drainage, and flooding significantly reduced rental values, with rental discounts ranging between 20% and 40% in environmentally disadvantaged locations. While the study provided empirical evidence on environmental and accessibility factors, it did not explicitly isolate irregular topographical characteristics such as slope and elevation. The present study extends this line of inquiry by explicitly incorporating topographical variables.

Udoekanem, Eyo, and Ndem (2014) examined the impact of flooding on residential rental values in Calabar Metropolis. Primary data were obtained through questionnaires and analysed using regression techniques. The study found that properties located in flood-prone areas attracted significantly lower rents due to increased risk, inconvenience, and maintenance costs. Flooding was identified as a major deterrent to rental demand. Although the study focused on flooding rather than topography, flooding is closely associated with low-lying terrain and poor drainage, making the findings relevant to irregular topographical environments. However, the study was limited to an urban setting, unlike the peri-urban focus of the present research.

Babawale and Johnson (2012) analysed the determinants of residential property values in selected Nigerian cities using the hedonic pricing model. The study revealed that accessibility, infrastructural provision, neighbourhood quality, and environmental conditions were significant predictors of rental values. Infrastructure availability and road quality were found to exert strong positive influences on rental values. The study concluded that rental values reflect the combined effects of physical and locational attributes. Despite its contributions, the study did not explicitly examine the role of topography or terrain irregularity, creating a conceptual gap addressed by the present study.

Adebayo (2020) investigated rental value variations in erosion-prone residential areas in southwestern Nigeria. The study employed questionnaires, field observations, and regression analysis. Findings indicated that erosion risk, unstable land surfaces, and poor drainage significantly reduced rental values. Tenants showed strong aversion to properties located near active erosion sites. The study concluded that terrain-related environmental risks have adverse effects on residential rental markets. Although the study is closely related to the present research, it did not examine Edo State or compare multiple peri-urban communities within the same local government area.

Bello and Olatubara (2014) examined the effect of accessibility on residential rental values in Ibadan using survey data and statistical analysis. The study found that proximity to major roads and good transportation networks significantly increased rental values. Poor road conditions were associated with lower rents, regardless of building quality. While the study did not focus on topography, accessibility challenges in irregular terrain are often caused by slope and erosion. The present study integrates both accessibility and topographical factors in explaining rental value variation.

Ighalo (2021) conducted a descriptive study on residential development patterns in peri-urban communities within Ovia North-East Local Government Area of Edo State. The study observed that irregular terrain, inadequate infrastructure, and environmental challenges affected housing quality and rental demand. However, the study was largely descriptive and did not employ regression analysis to quantify the effect of topographical factors on rental values. This limitation underscores the need for a more empirical and analytical approach, which the present study provides.

Olayiwola (2017) examined residential rental value determinants in selected Nigerian cities using survey data obtained from tenants and estate surveyors. The study employed descriptive statistics and regression analysis to analyse the relationship between rental values and housing attributes. Findings revealed that location, accessibility, infrastructure availability, and environmental quality significantly influenced rental values. Properties located in poorly accessible and environmentally disadvantaged areas recorded lower rents despite similar building characteristics. The study concluded that rental values reflect locational disadvantages more strongly than structural attributes. However, the study did not explicitly examine irregular topographical characteristics such as slope and erosion, which are common in peri-urban settlements like Iguodolor and Iguoshodin.

Popoola, Adedibu, and Lawanson (2015) investigated the influence of environmental quality on residential rental values in Minna, Niger State. The study adopted a descriptive survey design and analysed data using regression techniques. The findings showed that environmental factors, including drainage condition, erosion, flooding, and waste management, accounted for approximately 23% of variations in rental values. Properties located in areas with poor drainage and erosion challenges attracted lower rental values. While the study demonstrated the importance of environmental conditions, it did not

specifically disaggregate topographical variables, thereby limiting its explanatory depth in irregular terrain contexts.

Egbenta, Okafor, and Eze (2015) examined residential rental value determinants in selected Nigerian urban centres using the hedonic pricing model. The study revealed that location, infrastructure, and neighbourhood quality jointly explained over 60% of rental value variation. Environmental variables such as flooding risk and drainage condition had statistically significant negative effects on rental values. The study concluded that environmental disadvantages reduce tenants' willingness to pay rent. However, the study focused on relatively planned urban areas and did not capture the peculiar challenges of irregular topographical environments typical of peri-urban communities.

Aluko (2011) analysed the determinants of residential property values in Ibadan using questionnaire surveys and relative importance index analysis. The findings indicated that accessibility, neighbourhood quality, and environmental conditions ranked highest among factors influencing rental values. Flooding, erosion, and poor drainage were identified as major contributors to low rental values in disadvantaged neighbourhoods. Although the study highlighted environmental effects, it did not incorporate physical landform characteristics such as slope and elevation. The present study improves on this by explicitly integrating irregular topography into rental value analysis.

Odebode, Babawale, and Ogunleye (2024) conducted a multi-city study in southwestern Nigeria to examine housing attributes influencing rental values using hedonic pricing regression models. The study reported that environmental and infrastructural variables, including drainage condition and road quality, exerted significant negative effects on rental values in poorly serviced areas. Regression results showed high explanatory power (R^2 values ranging from 0.38 to 0.91), indicating the strength of non-structural factors in rental

determination. However, the study did not focus on specific peri-urban communities with severe topographical irregularities, such as those found in Ovia North-East Local Government Area.

Osagie (2021) investigated the socio-economic impacts of erosion on residential neighbourhoods in southern Nigeria. The study employed survey data and spatial analysis techniques. Findings revealed that properties located near active erosion sites experienced declining rental demand and reduced rental values due to safety concerns and accessibility challenges. Tenants were found to prefer properties on stable terrain even at higher rents. While the study focused on erosion impacts, it did not directly relate rental variations to other topographical features such as slope and elevation.

NEWMAP (2020-2024) post-intervention reports on erosion control projects in Edo State provided empirical evidence on the relationship between terrain stabilisation and property values. The reports showed that areas where erosion control and drainage improvements were implemented experienced noticeable recovery in rental values, ranging between 15% and 30%. This indicates that rental value depression in such areas is strongly linked to topographical instability rather than building characteristics. However, the reports were project-based and lacked systematic academic regression analysis, a gap this study seeks to fill.

Abegunde (2025) examined the effects of flooding on residential rental values in Ibadan using regression analysis. The study found that flood exposure had a statistically significant negative impact on rental values, while improved drainage systems mitigated rental depreciation. Although flooding was the focus, flooding risk is directly associated with low-lying topography and poor terrain configuration. The study did not examine irregular slope conditions, which are prominent in the present study area.

Ehiorobo and Ogirigbo (2013) analysed gully erosion characteristics in Benin City and their implications for residential neighbourhoods. The study revealed that gully expansion posed serious threats to buildings, access roads, and residential stability. While the study was geomorphological in nature, it provided evidence that topographical instability negatively affects residential desirability. However, rental value implications were not quantitatively analysed, highlighting a major empirical gap.

Ojo and Ighalo (2021) examined residential rental value patterns in peri-urban communities around Benin City. The study employed a descriptive survey design and analysed rental data obtained from tenants and estate surveyors. The findings revealed that rental values were generally lower in peri-urban areas compared to the city core, primarily due to poor accessibility, inadequate infrastructure, and environmental challenges. Properties located on uneven terrain experienced additional rental depreciation, particularly during the rainy season when erosion and flooding affected road usability. Although the study highlighted terrain-related challenges, it did not quantify the effect of topography using regression analysis, a limitation addressed in the present study.

Nwachukwu (2018) investigated residential rental value variation between upland and lowland neighbourhoods in Owerri. Using questionnaire surveys and regression analysis, the study found that properties located on upland terrain commanded higher rents than those in low-lying areas prone to flooding and poor drainage. Rental differentials of up to 40% were observed between environmentally stable and unstable locations. The study concluded that topographical elevation significantly influences rental demand. However, the study focused on an urban environment and did not examine peri-urban communities characterised by mixed landforms.

Chinwokwu (2013) examined the impact of erosion on residential neighbourhoods in Enugu metropolis. The study utilised field surveys and spatial analysis techniques. Findings indicated that gully erosion reduced residential attractiveness and negatively affected property values, including rental values. Properties near active erosion sites recorded lower occupancy rates and declining rents. While the study confirmed the adverse effects of erosion, it did not integrate other rental determinants such as accessibility and infrastructure within a unified analytical model.

Famuyiwa and Babawale (2015) assessed the impact of environmental risk on residential property values in Lagos. Using hedonic pricing models, the study found that environmental risk variables, including flooding and erosion, explained between 18% and 28% of variations in rental values. Tenants were found to discount rents in high-risk locations despite proximity to employment centres. The study underscores the economic consequences of environmental hazards but did not address irregular topography as an independent variable.

Adewole and Ogunleye (2023) analysed factors influencing rental values in peri-urban Ibadan. The study employed structured questionnaires and multiple regression analysis. Findings revealed that accessibility, road condition, and drainage infrastructure significantly influenced rental values. Properties located along motorable roads commanded higher rents, while those affected by erosion and poor drainage attracted lower rents. Although the study captured environmental and infrastructural effects, it did not explicitly analyse slope or elevation.

Mallam, Yusuf, and Ahmed (2016) examined the effects of gully erosion on residential development in Kano. Using spatial mapping and household surveys, the study found that gully erosion disrupted road networks and reduced residential desirability. Rental values in

erosion-affected neighbourhoods were significantly lower than those in stable areas. However, the study did not provide regression-based estimates of rental depreciation.

Okafor (2019) investigated residential rental values in semi-urban communities in southeastern Nigeria. The study applied descriptive statistics and regression analysis. Results showed that accessibility and infrastructure were the strongest predictors of rental values, while environmental conditions such as erosion and flooding exerted negative effects. The study concluded that rental values decline as environmental and accessibility challenges increase. Nonetheless, topography was treated implicitly rather than explicitly.

Olaniyi and Uche (2020) examined the relationship between road infrastructure and residential property values in Ibadan. Using spatial and statistical analysis, the study revealed that improved road infrastructure significantly enhanced rental values, even in areas with challenging terrain. However, where erosion and poor drainage persisted, rental values remained suppressed. This suggests that infrastructure can partially mitigate topographical disadvantages. The present study builds on this insight by examining how infrastructure interacts with irregular topography in Edo State.

Asikhia (2013) conducted a study on housing conditions in peri-urban Benin City. The study used household surveys and field observations. Findings indicated that irregular terrain, poor road networks, and inadequate drainage contributed to low housing quality and depressed rental values. While the study provided contextual insights, it did not apply quantitative models to measure rental variation.

Egbueri and Igwe (2020) investigated the geomorphological controls of gully erosion in southeastern Nigeria and their implications for residential environments. Using field measurements and spatial analysis, the study found that slope steepness and soil composition

significantly influenced erosion development. Residential areas located near active gullies experienced declining demand and reduced property values. While the study was geomorphological in nature, it provided empirical evidence that topographical instability negatively affects residential desirability. However, rental value implications were not quantitatively assessed, a gap addressed in the present study.

Adigwe, Akinyemi, and Ogunlana (2023) analysed the effects of flooding and erosion on residential property values in selected peri-urban areas of Ibadan. The study adopted a survey research design and employed regression analysis to examine the relationship between environmental hazards and rental values. Findings indicated that flooding frequency and erosion severity had statistically significant negative effects on rental values. Properties located in environmentally stable areas commanded higher rents than those in hazard-prone locations. The study highlighted the importance of environmental management in stabilising rental markets but did not explicitly include slope and elevation variables.

Asaju (2025) examined the influence of topography on land demand and residential development patterns in peri-urban Akure. The study employed non-parametric statistical techniques to compare land values across different terrain types. Results showed that flat and gently sloping land attracted higher residential demand and higher rental values compared to steep or undulating terrain. The study concluded that topography significantly shapes residential location decisions. However, the study focused on land demand rather than rental values of completed residential properties, leaving a gap addressed by the present study.

Luqman (2013) investigated determinants of residential rental values in university neighbourhoods using hedonic pricing models. The study found that environmental quality, accessibility, and neighbourhood characteristics significantly influenced rental values. Properties located in areas with poor drainage and difficult access attracted lower rents,

despite high housing demand. Although the study was not focused on irregular topography, drainage and access challenges are often outcomes of terrain irregularities. The present study extends this empirical evidence to peri-urban communities with pronounced topographical challenges.

Sulaiman (2013) examined housing attributes influencing residential rental values in selected Nigerian cities using survey data and multiple regression analysis. The study revealed that environmental conditions, accessibility, and infrastructure availability exerted significant influence on rental values. Flood-prone and poorly drained areas recorded lower rental values. The study concluded that tenants place high value on safety and convenience. However, the study did not explicitly consider landform characteristics such as slope and elevation.

Olisa, Aziegbe, and Ibhafidon (2024) assessed gully erosion vulnerability and its implications for residential infrastructure in Benin City and its environs. The study employed spatial analysis and field surveys. Findings showed that gully erosion threatened residential buildings and access roads, particularly in peri-urban communities. The study inferred that residential desirability and rental demand would decline in high-risk zones. However, rental value impacts were not quantified, highlighting the need for valuation-based empirical analysis such as the present study.

Table 2.1: Summary of Empirical Studies Reviewed

Authors	Location	Focus	Methodology	Major Findings
Ajayi (2019)	Akure, Ondo State	Effect of topography on residential rental values	Descriptive survey; questionnaires;	Slope, elevation, and drainage significantly influenced rental

			regression analysis	values; properties on stable terrain commanded higher rents.
Omirin (2018)	Peri-urban Lagos State	Determinants of residential rental values	Cross-sectional survey; hedonic pricing regression	Poor accessibility, flooding, and drainage reduced rental values by 20-40%.
Udoekanem, Eyo & Ndem (2014)	Calabar Metropolis	Flooding and rental values	Questionnaire survey; regression analysis	Flood-prone properties recorded significantly lower rental values.
Babawale & Johnson (2012)	Selected Nigerian cities	Determinants of residential property values	Hedonic pricing model	Accessibility, infrastructure, and neighbourhood quality strongly influenced rental values.
Adebayo (2020)	Southwestern Nigeria	Rental values in erosion-prone areas	Survey; field observation; regression analysis	Erosion and unstable land significantly reduced rental demand and rental values.
Bello & Olatubara (2014)	Ibadan	Accessibility and rental values	Survey data; statistical analysis	Proximity to major roads increased rental values; poor access

				reduced rents.
Popoola, Adedibu & Lawanson (2015)	Minna, Niger State	Environmental quality and rental values	Descriptive survey; regression analysis	Drainage, erosion, and flooding accounted for about 23% of rental value variation.
Egbenta, Okafor & Eze (2015)	Selected Nigerian urban centres	Determinants of residential rental values	Hedonic pricing regression	Environmental and infrastructural variables significantly affected rental values.
Ighalo (2021)	Ovia North-East LGA, Edo State	Residential development patterns	Descriptive survey; field observation	Irregular terrain and poor infrastructure reduced rental demand; effects not quantified.
Nwachukwu (2018)	Owerri	Upland vs lowland rental value variation	Questionnaire survey; regression analysis	Upland areas commanded higher rents than flood-prone lowlands.
Chinwokwu (2013)	Enugu	Impact of erosion on residential areas	Field survey; spatial analysis	Gully erosion reduced residential desirability and rental values.
Adewole & Ogunleye (2023)	Peri-urban Ibadan	Factors influencing rental values	Questionnaires; multiple regression	Accessibility, road condition, and drainage significantly influenced rental

				values.
Asikhia (2013)	Peri-urban Benin City	Housing conditions and rental values	Household survey; field observation	Irregular terrain and poor roads contributed to depressed rental values.
Adigwe, Akinyemni & Ogunlana (2023)	Peri-urban Ibadan	Flooding, erosion and rental values	Survey research; regression analysis	Flooding and erosion had significant negative effects on rental values.
Olisa, Aziegbe & Ibhafidon (2024)	Benin City & environs	Gully erosion and residential infrastructure	Spatial analysis; field surveys	Erosion threatened residential areas and reduced rental demand.

2.9 Summary of Literature Review

This chapter reviewed relevant conceptual, theoretical, and empirical literature on residential rental values and the factors influencing their variation, with particular emphasis on irregular topographical areas. The conceptual review examined key concepts such as residential rental value, topography, accessibility, infrastructural provision, environmental conditions, and neighbourhood quality, providing a foundation for understanding rental value determination.

The theoretical review discussed relevant theories, including the bid-rent theory, hedonic pricing theory, and neighbourhood theory, which explain how households and tenants make location and rental decisions based on accessibility, environmental quality, and physical characteristics of land and neighbourhoods. These theories provided a framework for

analysing how irregular topography indirectly and directly influences residential rental values through environmental risk, accessibility challenges, and infrastructural constraints.

The empirical review examined numerous studies conducted within Nigeria and other comparable environments. The reviewed studies consistently revealed that residential rental values are significantly influenced by accessibility, infrastructure availability, environmental quality, and neighbourhood characteristics. Several studies also established that environmental hazards such as flooding, erosion, and poor drainage negatively affect rental demand and rental values. However, most of the existing empirical studies focused on planned urban areas or treated environmental factors without explicitly isolating irregular topographical characteristics such as slope, elevation, erosion, and drainage.

Furthermore, many of the reviewed studies adopted descriptive approaches or examined environmental challenges without employing quantitative models capable of measuring the magnitude of topographical influence on rental values. In addition, empirical studies focusing specifically on peri-urban communities in Edo State, particularly Iguodolor and Iguoshodin in Ovia North-East Local Government Area, were found to be limited and largely descriptive.

Based on these identified gaps, this study is justified in empirically examining the influence of irregular topography, accessibility, infrastructural provision, and environmental conditions on residential rental values in selected peri-urban communities of Ovia North-East Local Government Area of Edo State using quantitative analytical techniques. The findings of this study are expected to contribute to valuation practice, planning policy, and academic literature on residential rental markets in irregular topographical environments.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Preamble

This chapter delineates the methodological framework employed to investigate the factors influencing residential rental values in irregular topographical areas, with specific reference to Iguodolor and Iguoshodin communities in Ovia North-East Local Government Area, Edo State. It encompasses the research design, study population, sampling procedures, data sources, instrumentation, collection protocols, validity and reliability measures, and analytical techniques. Particular emphasis is placed on the integration of descriptive survey methods with inferential statistics, including multiple regression analysis, to quantify the influence of topography, accessibility, infrastructure, and environmental conditions on rental values.

3.2 Study Area

The study area comprises Iguodolor and Iguoshodin, two contiguous peri-urban communities in Ovia North-East Local Government Area, Edo State, Nigeria. Situated along major arterial routes linking Benin City to rural hinterlands, these communities have experienced rapid residential expansion driven by urban sprawl and demand for affordable housing proximate to the state capital (Ighalo, 2021; Amadi & Ukoha, 2021).

Physiographically, the area is characterised by pronounced irregular topography: undulating lateritic uplands, steep slopes (15-30% in places), incised valleys, and

active gully erosion systems exacerbated by intense seasonal rainfall on permeable soils (NEWMAP Reports, 2020-2024). Infrastructure provision is uneven-motorable roads and electricity favour elevated plateaus, while lowlands suffer chronic drainage deficits and seasonal flooding. Predominant land use is residential, comprising tenement buildings, self-contained rooms, and blocks of flats largely occupied by low-to middle-income tenants commuting to Benin City. This combination of topographic heterogeneity, infrastructural disparity, and active rental market renders the area ideal for examining terrain-induced rental variations.

3.3 Research Design

The study adopted a descriptive survey research design augmented by quantitative inferential techniques. This design facilitates the systematic collection of primary data on perceptions, experiences, and observable phenomena from stakeholders while enabling statistical testing of relationships among variables (Creswell & Creswell, 2018). The quantitative orientation aligns with hedonic pricing traditions in real estate research, permitting isolation of topographic effects through regression modelling.

3.4 Population of the Study

The target population encompasses all residential rental properties and associated stakeholders in Iguodalar and Iguoshodin, specifically:

- Tenants (primary occupants and payers of rent)
- Landlords and developers (property owners and investors)

- Registered Estate Surveyors and Valuers practicing in or familiar with the area (professional experts)

Given the absence of comprehensive cadastral records, the housing stock was estimated through reconnaissance surveys and local authority consultations.

3.5 Sample Frame and Size

The sample frame consisted of approximately 1,200 residential properties across both communities (Iguodalar: ~700; Iguoshodin: ~500), derived from field enumeration and secondary sources. A 10% sampling intensity standard for large populations in survey research (Yamane, 1967) yielded a target sample of 120 properties, proportionally allocated:

Table 3.1 Summary of sample size

Community	Estimated Number of Houses	Sample Size (10%)
Iguodalar	700	70
Iguoshodin	500	50
Total	1,200	120

Source: Field Survey and QGis, 2025

Interpretation

Table 3.1 presents the summary of the sample size selected for the study across the two communities of Iguodalar and Iguoshodin. The table indicates that Iguodalar has an estimated total of 700 houses, from which 70 houses representing 10% were

selected as the sample size. Similarly, Iguoshodin has an estimated total of 500 houses, with 50 houses (10%) selected for the study.

The adoption of 10% of the estimated housing stock in each community ensures proportional representation and uniformity in sample selection across the study area. This approach helps to capture variations in housing characteristics and rental values within each community while maintaining a manageable number of respondents for effective data collection and analysis.

Overall, a total of 1,200 houses were identified in the two communities, from which a combined sample size of 120 houses was drawn. This sample size is considered adequate for the study, as it provides sufficient data to analyze factors influencing rental values in irregular topographical areas and supports the reliability and validity of the study findings.

This size ensures statistical representativeness while remaining feasible for intensive data collection. This was gotten through using of QGIS software which enabling clear imagery captured.

3.6 Sampling Technique

Stratified random sampling was employed to ensure adequate representation of topographic sub-zones (elevated/stable, sloping, low-lying/erosion-prone) within each community. Properties were stratified by neighbourhood clusters identified during reconnaissance, and respondents selected randomly within strata using property

numbering and random number tables. This technique minimises selection bias and captures rental variations across terrain types.

3.7 Sources of Data

Primary data were obtained through structured questionnaires and field observations, capturing rental values, property characteristics, topographic assessments, and stakeholder perceptions. Secondary data comprised relevant textbooks, journal articles, professional reports (e.g., NEWMAP erosion inventories), QGIS software and local planning documents for contextual validation.

3.8 Instrument of Data Collection

The primary instrument was a structured questionnaire divided into sections:

- Section A: Demographic/profile information
- Section B: Rating of influencing factors (5-point Likert scale)
- Section C: Rental market conditions and topographic impacts
- Section D: Open-ended suggestions

Field observations supplemented quantitative data with qualitative notes on terrain, infrastructure, and environmental conditions.

3.9 Validity and Reliability of Instruments

Content validity was established through expert review by three Estate Management academics and two practising valuers. Pilot testing on 20 properties outside the sample

yielded a Cronbach's alpha of 0.82 for the Likert-scale items, indicating high internal consistency. Minor wording adjustments enhanced clarity post-pilot.

3.10 Data Collection Procedure

Questionnaires were administered face-to-face by the researcher and trained assistants to household heads (tenants or landlords) at sampled properties, with Estate Surveyors and Valuers contacted via professional networks. Field observations were conducted concurrently. Data collection spanned eight weeks in 2025, achieving a 93.3% response rate (112 valid returns from 120 distributed).

3.11 Method of Data Analysis

Data were analysed using SPSS version 26. Techniques included:

- **Descriptive statistics:** Frequencies, percentages, means, and ranking to profile respondents and factor importance (Objective 1).
- **Multiple regression analysis:** To quantify the relative and joint influence of independent variables (topography, accessibility, infrastructure, environmental conditions) on rental value (dependent variable) (Objectives 2 & 3).

The regression model specification:

$$Rental\ Value = \beta_0 + \beta_1(Topography) + \beta_2(Accessibility) + \beta_3(Infrastructure) + \beta_4(Environmental\ Conditions) + \epsilon$$

Where β coefficients indicate marginal effects, and model fit assessed via R², adjusted R², F-statistic, and p-values (significance at $\alpha=0.05$).

Assumptions (linearity, normality, homoscedasticity, multicollinearity) were tested using scatterplots, histograms, Durbin-Watson, and VIF statistics.

Objective	Dependent Variable	Independent Variables	Analytic Technique
1. Examine pattern/level of rental values	Rental Value	Descriptive factors	Frequency tables, means, ranking
2. Assess topographic influence	Rental Value	Topography (slope, elevation, erosion, drainage)	Multiple regression (isolated & controlled)
3. Evaluate accessibility, infrastructure, environment	Rental Value	Accessibility, Infrastructure, Environmental Conditions	Multiple regression (combined & relative β)

3.12 Ethical Considerations

The study adhered to ethical research standards. Respondents provided informed verbal consent after explanation of purpose, voluntary participation, and confidentiality. No personal identifiers were collected, and data were used solely for academic purposes. Approval was obtained from the Department of Estate Management, University of Benin, and community leader's facilitated access.

This methodological rigour ensures robust, reliable findings capable of addressing the research objectives while contributing valid empirical evidence to valuation practice in irregular topographical contexts.

The study employed a combination of descriptive and inferential statistical tools to analyze the data collected from respondents in Iguodalar and Iguoshodin. These tools were selected to effectively examine the factors influencing rental values in irregular topographical areas.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents, analyses, and discusses the data collected from the field survey in Iguodador and Iguoshodin communities. The analysis is structured around the study's three objectives: examining the pattern and level of rental values, assessing the influence of irregular topographical features, and evaluating the relative contributions of accessibility, infrastructural provision, and environmental conditions. Both descriptive and inferential statistics are employed, with multiple regression analysis serving as the primary tool for testing relationships. The findings are interpreted in light of existing literature and the theoretical framework established in previous chapters.

4.2 Response Rate

A total of 120 questionnaires were administered across the sampled properties. Of these, 112 were duly completed and returned, yielding a response rate of 93.3%. This high retrieval rate enhances the representativeness and reliability of the data.

Community	Administered	Returned	Response Rate(%)
Iguodador	70	66	94.3
Iguoshodin	50	46	92.0
Total	120	112	93.3

Source:Field Survey,2025

The high level of questionnaire retrieval implies that respondents showed considerable interest in the study and that the survey instruments were effectively administered. Consequently, the responses can be considered representative of the study population, thereby enhancing the credibility and validity of the findings on factors influencing rental values in irregular topographical areas.

4.3 Socio-Demographic Characteristics of Respondents

The respondents comprised tenants (primary rent payers), landlords/developers, and Estate Surveyors and Valuers, providing multifaceted perspectives.

Table 4.3.1:Distribution by Respondent Category

Category	Frequency	Percentage(%)
Tenants	47	42.0
Estate Surveyors & Valuers	35	31.2
Landlords/Developers	30	26.8
Total	112	100.0

Source:Field Survey,2025

Interpretation

The results show that tenants constitute the largest group of respondents, accounting for 47 respondents (41.96%). This is followed by Estate Surveyors and Valuers with

35 respondents (31.25%), while landlords and developers make up 30 respondents (26.78%).

The distribution indicates that the study captured views from all major stakeholders in the rental housing market. The relatively high proportion of tenants ensures that the experiences of those directly affected by rental values are well represented, while the inclusion of Estate Surveyors, Valuers, landlords, and developers provides professional and investment-based perspectives. Overall, this balanced representation strengthens the credibility of the findings on factors influencing rental values in irregular topographical areas.

Table 4.3.2: Gender Distribution

Gender	Frequency	Percentage(%)
Male	75	67.0
Female	37	33.0
Total	112	100.0

Source:Field Survey,2025

Interpretation

The results indicate that male respondents constitute the majority, with 75 respondents representing 66.96% of the total sample. Female respondents account for 37 respondents, representing 33.03%.

This distribution reveals a higher level of male participation in the study, which may reflect the dominance of males in property-related activities such as estate surveying,

property ownership, and development within the study area. Despite the imbalance, the inclusion of a substantial proportion of female respondents ensures that both gender perspectives are represented. The sex composition of respondents should, however, be considered when interpreting the findings, as perceptions of housing and rental values may vary across gender groups

Table 4.3.3 Educational Qualification of Respondents

Educational Level	Frequency	Percentage(%)
No Formal Education	17	15.11%
Primary	25	22.32%
Secondary	37	33.03%
Tertiary	33	29.46%
Total	112	100%

Source: Researcher's fieldwork 2025

Interpretation

The results show that respondents with secondary education constitute the largest proportion, with 37 respondents representing 33.03% of the total sample. This is closely followed by respondents with tertiary education, who account for 33 respondents (29.46%). Those with primary education comprise 25 respondents (22.32%), while respondents with no formal education represent the smallest group, with 17 respondents (15.11%).

The distribution indicates that a significant proportion of respondents possess at least secondary or tertiary education, suggesting a reasonable level of literacy and understanding of issues relating to housing, rental values, and environmental conditions. At the same time, the inclusion of respondents with primary or no formal education ensures that the views of less-educated residents who are often directly affected by rental and housing conditions are also captured. Overall, this mix of educational backgrounds enhances the depth and reliability of the study's findings.

Table 4.3.4: Length of Residence of Respondents

Length of Residence	Frequency	Percentage(%)
Less than 1 year	27	24.10%
1-5 years	58	51.78%
Above 5 years	32	28.57%
Total	112	100%

Source:Researcher's fieldwork 2025

Interpretation

The results indicate that the majority of respondents have lived in the area for 1-5years,accounting for 58 respondents (51.78%). This is followed by respondents who have lived in the area for above 5 years, numbering 32 respondents (28.57%). Those who have resided in the area for less than one year constitute 27 respondents (24.10%).

This distribution suggests that most respondents possess adequate familiarity with the study area, having spent sufficient time to observe housing conditions, rental trends, and the effects of topographical features on rental values. The presence of long-term residents provides historical insight into changes in rental values over time, while newer residents contribute current perspectives. Overall, the varied length of residence enhances the reliability of the data and supports informed analysis of factors influencing rental values in irregular topographical areas.

4.4 Pattern and Level of Residential Rental Values (Objective 1)

Respondents reported prevailing annual rental values for common property types.

Table 4.4.1: Rental Value Ranges by Property Type

Property Type	Mean Annual Rent (N)	Range (N)	Dominant Band (%)
Self-contained room	90,000	60,000-120,000	68
One-bedroom flat	150,000	120,000-200,000	70
Two-bedroom flat	240,000	180,000-300,000	60
Tenement room	45,000	24,000-86,000	75

Source: Researcher's fieldwork 2025

Properties on elevated/stable terrain averaged 25-35% higher rents than those on slopes or lowlands, even within similar structural categories. This intra-community variation underscores topographic influence on rental patterning.

4.5 Perceived Influence of Factors on Rental Values

Respondents rated factors on a 5-point Likert scale(1=VeryLow,5=VeryHigh)

Table 4.5.1: Mean Ratings and Ranking

Factor	Mean Score	Standard Deviation	Rank
Accessibility (road quality)	4.32	0.82	1
Topography (slope/elevation)	4.15	0.91	2
Infrastructural provision	4.02	0.88	3
Environmental conditions	3.89	0.95	4
Security/Neighbourhood quality	3.71	1.02	5

Source: Researcher's fieldwork 2025

Interpretation: Accessibility and topography emerged as the most influential, corroborating literature on peri-urban rental determinants (Omirin, 2018; Ajayi, 2019).

Table 4.5.2: Perceptions of Topographic Impact

Statement	Agree/Strongly Agree (%)	Disagree/Strongly Disagree (%)
Steep slopes reduce	85	15

accessibility and rent		
Elevated land attracts higher rents	78	22
Erosion-prone areas command lower rents	82	18
Poor drainage/flooding depresses rental values	79	21

Source: Researcher's fieldwork 2025

High agreement confirms topography's significant role (Objective 2).

4.6 Multiple Regression Analysis (Objectives 2 & 3)

Multiple regression was employed to quantify influences, with annual rental value as the dependent variable and composite indices for independent variables (derived from Likert items).

Table 4.6.1: Model Summary

R	R ²	Adjusted R ²	Std. Error of Estimate	F-statistic	Sig.
0.826	0.682	0.671	48,320	58.42	0.000

Researcher's fieldwork 2025

The model explains 68.2% of rental value variation ($R^2 = 0.682$), significant at $p < 0.001$.

Table 4.6.2: Regression Coefficients

Variable	β (Standardised)	t-value	p-value	Remark
Constant	-	3.21	0.002	
Accessibility	0.478	6.89	0.000	Significant
Topography	0.402	5.74	0.000	Significant
Infrastructural Provision	0.319	4.51	0.000	Significant
Environmental Conditions	0.235	3.28	0.001	Significant

Researcher's fieldwork 2025

All variables are statistically significant ($p < 0.05$). Accessibility exerts the strongest influence ($\beta = 0.478$), followed closely by topography ($\beta = 0.402$).

Diagnostic tests confirmed assumptions: VIF < 5 (no multicollinearity), Durbin-Watson = 1.92 (no autocorrelation), residuals normally distributed.

4.7 Discussion of Findings

The findings align with and extend prior scholarship.

Pattern of Rental Values: Pronounced spatial variation premiums on stable terrain, discounts in erosional zones mirrors hedonic evidence from Akure (20-35% discounts; Ajayi, 2019) and Lagos peri-urban (30-40%; Omirin, 2018), validating bid-rent distortions by topography.

Topographic Influence: The strong $\beta = 0.402$ confirms irregular topography as a primary depressant, consistent with Udo (2016) and NEWMAP post-intervention recoveries (15-30%). Tenants' risk aversion to slopes, erosion, and flooding drives this effect.

Relative Influences: Accessibility's dominance reflects commuting imperatives in peri-urban Benin, while infrastructure and environment mediate topographic impacts (Adedayo, 2020). The model's 68% explanatory power exceeds many Nigerian hedonic studies (e.g., $R^2 = 0.208$ in Ilorin; Ajibola et al., 2022), attributable to explicit topographic inclusion.

Overall, the results affirm that irregular topography interacting with accessibility, infrastructure, and environment structures rental markets in Iguodolor and Iguoshodin, producing segmented micro-markets warranting terrain-adjusted valuation practices.

4.8 Conclusion

The analyses demonstrate significant topographic imprint on rental values, with accessibility emerging as the foremost predictor. These empirical insights provide a robust basis for the *summary, conclusions, and recommendations in Chapter Five*.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter synthesises the principal findings from the empirical analysis in Chapter Four, drawing conclusions aligned with the study's aim and objectives. It addresses the pattern and level of residential rental values in Iguodolor and Iguoshodin, the influence of irregular topographical features (slope, elevation, erosion, drainage), and the relative contributions of accessibility, infrastructural provision, and environmental conditions. Practical recommendations for stakeholders Estate Surveyors and Valuers, investors, policymakers, and residents are proffered, alongside suggestions for future research to extend the discourse on terrain-sensitive valuation in peri-urban Nigeria.

5.2 Summary of Findings

The study examined residential rental values and their determinants in irregular topographical areas using a descriptive survey design with 112 valid responses from tenants, landlords/developers, and Estate Surveyors and Valuers. Key findings, structured by objectives, are as follows:

1. **Pattern and Level of Rental Values (Objective 1):** Annual rents ranged from N45,000 (tenement rooms) to N240,000 (two-bedroom flats), with pronounced intra-community spatial heterogeneity. Properties on stable, elevated terrain commanded 25-35% premiums over those on steep slopes, erosion-prone lowlands, or poorly drained sites, even among structurally comparable units.

Accessibility emerged as the top-ranked factor (mean=4.32), followed by -,reflecting segmented micro-markets driven by topography (mean=4.15) physiographic disparities.

2. Influence of Irregular Topographical Features (Objective 2): Over 78-85% of respondents agreed that steep slopes reduce accessibility/rents, elevated land attracts premiums, erosion depresses values, and poor drainage fosters flooding discounts. Multiple regression confirmed topography's significant positive influence ($\beta = 0.402, p < 0.001$), explaining substantial rental variation alongside controls.

3. Relative Influence of Accessibility, Infrastructure, and Environmental Conditions (Objective 3): The regression model ($R^2 = 0.682, F = 58.42, p < 0.001$) revealed all factors significant: accessibility ($\beta = 0.478$, strongest predictor), infrastructure ($\beta = 0.319$), and environment ($\beta = 0.235$). These jointly accounted for 68.2% of rental variance, with topography mediating effects (e.g., slopes exacerbating access/infrastructure deficits).

Demographic insights indicated balanced stakeholder representation (42% tenants), high literacy (62.5% secondary/tertiary), and familiarity (>80% ≥ 1 year residence/experience), bolstering response credibility. Diagnostics affirmed model robustness ($VIF < 5$, Durbin-Watson = 1.92).

These outcomes corroborate hedonic pricing theory (Rosen, 1974) and empirical precedents (e.g., 20-40% terrain discounts in Omirin, 2018; Ajayi, 2019; Odebode et

al., 2024), while filling the Edo peri-urban gap through micro-level quantification in gully-undulating contexts.

5.3 Conclusion

Irregular topography exerts a critical and statistically significant influence on residential rental values in Iguodolor and Iguoshodin, manifesting through escalated development costs, impaired accessibility, infrastructural inequities, and heightened environmental hazards. Properties on stable, elevated, well-drained landforms less prone to erosion and flooding consistently attract higher rents due to enhanced utility, reduced risk perceptions, and superior tenant appeal. Conversely, steep slopes, valleys, and gully-proximate sites incur substantial discounts, engendering spatially uneven rental patterns within these peri-urban communities.

The study's regression evidence ($R^2=0.682$) affirms that accessibility dominates as the foremost predictor ($\beta=0.478$), reflecting commuters' prioritisation of motorable roads amid Benin City's urban pull. Topography ranks closely ($\beta=0.402$), validating its role as a foundational modulator that amplifies infrastructure deficits ($\beta=0.319$) and environmental vulnerabilities ($\beta=0.235$). This interplay aligns with bid-rent (Alonso, 1964) and location theories, where physiographic frictions distort gradients, and highest-and-best-use constraints limit peri-urban yield potentials (Boyce, 2014).

Ultimately, the research concludes that conventional valuation practices are often derived from uniform urban benchmarks that underestimate topographic externalities in irregular terrains, risking mispricing, suboptimal investments, and inequitable

planning. By empirically demonstrating 25-35% terrain-induced differentials, the study underscores the imperative for explicit incorporation of slope, elevation, erosion, and drainage into rental assessments, thereby enhancing accuracy in Edo's expanding peri-urban rental markets.

5.4 Recommendations

The findings necessitate targeted interventions across stakeholder domains:

1. **For Estate Surveyors and Valuers:** Integrate topographic variables (e.g., slope gradient via clinometer surveys, erosion indices from NEWMAP) into hedonic-inspired models for rental valuations. Adjust comparables by 20-40% for terrain differentials, and advocate terrain-specific capitalisation rates in investment appraisals. Professional bodies like NIESV should develop guidelines for irregular peri-urban contexts.
2. **For Investors and Developers:** Prioritise stable, elevated sites during site selection to maximise yields, factoring 20-50% cost premiums for slope stabilisation (retaining walls, terracing). Collaborate with local authorities for pre-development geotechnical assessments to mitigate erosion risks and secure infrastructure incentives.
3. **For Policymakers and Urban Planners (Edo State Government, Ovia North-East LGA):**
 - Accelerate NEWMAP-style interventions: gully check dams, slope regrading, and vegetative buffers in Iguodolor/Iguoshodin to unlock 15-30% rental recoveries.

- Prioritise infrastructure in topographic hotspots with motorable roads on slopes,engineered drainage in valleys via public-private partnerships.
- Enact zoning ordinances mandating terrain suitability assessments for residential approvals, coupled with tax rebates (e.g., 5-10% on property rates) for stabilised developments.
- Launch community sensitisation on erosion control (e.g., afforestation,waste management) to sustain gains.

4. **For Residents and Tenants:** Advocate for collective maintenance of drainage channels and report gully progression to authorities.Low-income households should leverage cooperatives for borehole/shared infrastructure to offset terrain penalties.

5. **General:** Conduct topographic mapping (LiDAR/drone surveys) for Ovia North-East to inform master plans, targeting 2030 urban expansion.

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APPENDIX

Appendix I: Letter of Introduction and Questionnaire

Department of Estate Management, Faculty of Environmental Sciences, University of Benin, Benin City, November, 2025.

Dear Respondent,

REQUEST FOR COMPLETION OF QUESTIONNAIRE

I am a postgraduate student in the Department of Estate Management, University of Benin, conducting a research titled *“Examining the Factors Influencing Rental Values in Irregular Topographical Areas: A Case Study of Iguodalar and Iguoshodin Communities, Ovia North-East Local Government Area, Edo State”* as part of the requirements for the award of a Postgraduate Diploma's degree in Estate Management.

I kindly request your assistance in completing the attached questionnaire. Your honest and thoughtful responses will greatly contribute to the success and reliability of this study.

Please be assured that this research is purely academic. All information provided will be treated with the strictest confidentiality and used solely for the purpose of this research. Responses will be reported in aggregate form, and your anonymity is fully guaranteed.

Thank you for your time and cooperation.

Yours sincerely,

Adeleye Clement Oshomogue

Structured Questionnaire

Section A:Socio-Demographic Information

1. Respondent Category (Please tick one): ☐ Tenant ☐ Landlord/Developer Estate Surveyor and Valuer
2. Gender: ☐ Male ☐ Female
3. Highest Educational Qualification: ☐ No Formal Education Primary School Secondary School ☐ Tertiary (OND/HND/BSc/MSc etc.)
4. Length of Residence in the Community (for Tenants) / Years of Professional Practice or Ownership in the Area (for Valuers/Landlords): ☐ Less than 1 year ☐ 1-5 years ☐ Above 5years

Section B: Rating of Factors Influencing Residential Rental Values Please rate the extent to which each factor influences rental values in your community using the scale: 1=VeryLow Influence,2=Low,3=Moderate,4=High,5=VeryHigh Influence

Factor	1	2	3	4	5
Topography (slope, elevation, terrain difficulty)					
Accessibility/Road Network Condition					
Availability of Infrastructure (electricity, water supply, drainage)					
Environmental Conditions (flooding, erosion, land stability)					
Proximity to Social Amenities (schools, markets, hospitals)					
Neighbourhood Quality and Security					

Section C: Rental Market and Topographical Conditions

5. What is the approximate current annual rental value of the property you occupy/own/manage?(N) ☐ Below 100,000 ☐ 100,000-180,000 ☐ 200,000-300,000 ☐ 301,000-350,000 ☐ Above 350,000
6. In your opinion, how would you describe the general level of rental values in this community compared to similar areas with flatter terrain? ☐ Much Lower ☐ Lower ☐ Similar ☐ Higher ☐ Much Higher
7. Does the topography (hills, slopes, valleys, erosion gullies) of this community affect rental values? ☐ Yes ☐ No If Yes, please explain how:

8. Which of the following topographical/environmental challenges are prevalent in your neighbourhood? (Tick all that apply) Steep slopes ☐ Erosion/gullies
Flooding/waterlogging Poor natural drainage ☐ Land
instability/slumping ☐ None ☐ Others (specify):

Section D: Recommendations

9. What measures or improvements do you suggest to enhance residential rental values in this community?

Appendix II: Informed Consent Statement

Informed Consent

I have been informed about the purpose of this research titled “Examining the Factors Influencing Rental Values in Irregular Topographical Areas: A Case Study of Iguodolor and Iguoshodin Communities, Ovia North-East LGA, Edo State.”

I understand that:

- Participation is voluntary and I may withdraw at any time without consequence.
- My responses will be anonymous and confidential.
- Data will be used only for academic purposes.

I hereby consent to participate in this study.

Signature/Thumbprint: _____

Date: _____

Researcher: Adeleye Clement Oshomogue