Impact of Urban Flood Management Project Intervention on Property Values in Ibadan, Nigeria

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Being a M.Sc. Thesis Submitted to the Department of Estate Management, Faculty of Environmental Design & Management, Lead City University, Ibadan, Oyo State, Nigeria

In Partial Fulfilment of the Requirement for the Award of Master of Science Degree (MSc) in Estate Management

2024

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Certification

This is to certify that **Babajide Femi OGUNTOKUN** with matriculation number **LCU/PG/003198** carried out this research work titled "Impact of Ibadan Urban Flood Management Project Interventions on Property Values in Ibadan, Nigeria" in the Department of Estate Management, Faculty of Environmental Design and Management, Lead City University, Ibadan, Oyo State, for the award of Master of Science (M.Sc.) in Estate Management and that this has not been previously submitted in this institution or any other.

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Dedication

This Thesis is dedicated to the Master of the Universe, The One and Only True God, and to the loving memory of my beloved Dad and Mum. I love you both, even in death.

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Acknowledgement

I want to reference Almighty God that started this journey with me from the beginning this course of study through to the end of same.

My sincere appreciation goes to Leads City University as an Institution for giving me the opportunity to be among the first set to undergo the study of MSc Estate Management. I sincerely express my appreciation to the Chairman of Council, Prof. Jide Owoeye, the Vice-Chancellor of the University, Prof. K. A. Adeyemo, Registrar, Dr. Oyebola Ayeni, Provost, Postgraduate College, Prof. Oredein. Also is the Head of Department and Lecturers of the Department of Estate Management, Lead City University.

My sincere appreciation goes to my Supervisor Dr. (ESV) Igho Fayomi for her intellectual contributions, constructive criticism and her open door and friendly policy which has driven this research work to a successful destination. Also, I appreciate the Postgraduate Co-Ordinator ESV. Adewale Adedokun. In addition, I am very grateful to the following lecturers who have carefully, but elaborately tutored me in the course of this programme; Prof. B.T. Aluko, Prof. T.T. Oladokun, Prof. J.B. Oyedele, Dr. G. B. Ekemode, Dr. Samson Ojekalu, Dr. Bunmi Alausa and other non-academic Staff of the Department of Estate Management, Lead City University, Ibadan, whose devotion to duty under a friendly atmosphere has been an inspiration to me personally and has contributed immensely to the successful completion of this study.

I appreciate most specially my siblings and affectionate ones, Wale, Nike, Ronke, Seyi, Abimbola. Also, my friends and colleagues both at work and in class.

Though the above-mentioned Institutions and persons have assisted in the process of this research work, I alone stand responsible for the errors, if any, found in the work.

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Abstract

Flooding has long posed a significant environmental threat in Ibadan, Nigeria, causing widespread property damage, displacements, and economic disruptions since the first severe floods were recorded in 1951. This study assesses the impact of the Ibadan Urban Flood Management Project (IUFMP), jointly funded by the World Bank and Oyo State government, on property values in the city. The research aim to fill a critical gap by examining how flood management interventions, including drainage construction and river channelization, have influenced property values from 2012 to 2022. Key findings indicate varying levels of awareness of the IUFMP among community members and estate surveyors, with a significant percentage (67.6%) unaware of specific project details despite its implementation. Trends in property rental values show significant increases over the study period, with notable spikes in 2016 and 2022 across different property types. Similarly, capital or market values for properties experienced substantial growth, particularly in 2016 and 2022, reflecting changing real estate dynamics in Ibadan. Findings on the project's impact reveal that a majority of respondents disagreed with claims of increased capital value (54.8%) and rental value (53%), while 43.3% reported a reduction in rental value. Importantly, a significant proportion (66.3%) strongly disagreed that no impact was felt, and a majority (74.4%) disagreed that there was less dirt and filthiness post-project. In conclusion, the study suggests that the IUFMP did not significantly affect property values, as existing community measures already effectively manage flooding issues. This underscores the importance of enhancing community involvement and implementing comprehensive flood management strategies to address urban flooding challenges in Ibadan.

Keywords: Flood Management, Project Interventions, Property Values, Property Investment, Urban

Word Count: 257

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List of Accronyms

Abbrevations	Meaning
ANOVA	Analysis of Variance
FASB	Financial Accounting Standards Board
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
IUFMP	Ibadan Urban Flood Management Project
IVSC	International Valuation Standards Council
IFRS	International Financial Reporting Standards
NIESV	Nigeria Institution of Estate Surveyors and Valuers
RICS	Royal Institute of Chattered Surveyors

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Chapter One

Introduction

1.1 Background to the Study

Property value refers to the fair market price a property can command when leased or sold. For real property to hold value, it must possess utility, scarcity, and effective demand. Thus, property values serve as critical indicators of economic health and urban development, reflecting the desirability, safety, and quality of a location. In Ibadan, Nigeria, these values have been significantly impacted by recurring urban flooding.

Flood is an environmental damage caused by an overflow of water body. Since time immemorial especially in biblical days, the effect of floods has always had a devastating impact on the environment[1]. Urban flood is concerned with the overland flow of water over the street that is sufficient to cause significant property damage, traffic defections, health hazards, and loss of valuable assets[2]. Any form of overflow of water from rivers and other water bodies that is capable of causing severe damage to life and property value in any urban setting is called urban flood[3]. Floods impact negatively on the environment and are capable of causing an extinction of life and it is a disaster that leaves lasting damage to both humans and non-humans. Floods can be seen as predictable natural environmental hazards that can be mitigated[4]. The damaging effect of flood cannot be overemphasized across the continent. Yuba, California experienced flooding in 1997, where over 38,000 inhabitants were evacuated; 322 homes were destroyed; close to 1000 acres, 15,500 acres, and 1700 acres of residential, farmland, and industrial land were flooded respectively[5]. According to the UK Environment Agency, over 10% of the population is directly at risk from flooding, with a greater percentage of the population being indirectly affected by flooding due to road closures, service disruption, and the loss of goods and produce[6].

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Natural disasters are on the increase globally and their impacts affect the physical, economic, social, geographical, psychological, and cultural spheres of human endeavor. One such natural disaster is flooding. Floods can be defined, as large volumes of water in places that are usually dry or usually contain much less water. It is an abnormally large quantity of water that cannot be contained within the existing drainage channels. Flooding is a global phenomenon occurring mainly along river valleys. It has been pointed out that, Concerns for flooding have increased in recent times due to climate change (especially in more frequent and severe rainfall events)[7]. The primary cause of flooding in the world is directly or indirectly related to rainfall and the catchment areas of major river systems[8].

Flooding is a common phenomenon all over the world but is most distressing in developing countries like Nigeria. In Nigeria, Flooding is one of the key natural disasters that affect the population and has led to enormous loss of lives and properties; Nigeria has a history of flood disasters, the most recent occurred in 2012[9]. The 2012 Nigerian floods began in early July 2012 and killed 363 people and displaced over 2.1 million people as of November 2012. In reporting about the 2012 floods in Nigeria, it was affirmed that 30 of Nigeria's 36 states were affected by the floods The National Emergency Management Agency (NEMA) reports that floods devastated 30 of Nigeria's 36 states, with Kogi and Benue States suffering the most severe damage[10]. The floods were also termed as the worst in 40 years and affected an estimated seven million people. The estimated losses and damages caused by the floods were worth N2.6 trillion. Flood is also most pronounced in urban areas where high densities of people, assets, and vulnerable infrastructure occur. Severe flood events are increasingly affecting major urban centers such as Ibadan where people and economic activities are concentrated[5]. Flooding has been an incessant problem in Oyo state. Floods are a common occurrence in Ibadan and have been officially recorded since 1951, most of the recorded floods occurred in August a period between the first rainfall peak and the rainfall break[11]. As

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a result of this problem of alarming state of affairs, investigations into the human and social sides of flood hazards are more necessary than ever[12].

Flooding in Ibadan, particularly during the rainy season, has led to substantial damage to properties, displacement of residents, and disruptions to economic activities, thereby decreasing the attractiveness of flood-prone areas for both investment and habitation[13].

Ibadan has a population of 5,591,589, and it is one of the 3 largest cities in Nigeria after Lagos and Kano. Ibadan is located in South Western Nigeria and it is the Capital of Oyo State[14]. Ibadan lies mostly on the Lowlands which are punctuated by rocky outcrops and a series of hills. The metropolis is drained by three important rivers; they are river Ogunpa, River Ona, and River Ogbere. There are several tributaries of these rivers, and serious flood disasters have occurred in Ibadan in 1963, 1978, 1980, 1985, 1987, 1990, 2011 and the most recent in 2017[15]. Apart from heavy rainfall being the major cause of the recent flood, people organizations, businesses, and even the government have not been abiding by the environment laws this has been one of the major contributions to flooding in Oyo state[16]. The heaviest rainfall on record in Ibadan occurred in August 1980, when the city recorded 274mm of rainfall during a single flood episode[11]. The second heaviest occurred in 1963 with a rainfall of 258mm. like many previous floods, the August 2011 flood came during the August break period, a time when the city ordinarily should not experience rainfall of such magnitude. It was also reported that the flooding which took place after a downpour of 187.7mm occurred for about 4 to 5 hours on August 26th 2011, induced by the overflow of the Eleyele dam causing the death of more than 120 people and serious damage to infrastructure. The flood swept through Eleyele, Poly Road, Apete, Agbowo - U.I area, Odo - Ona Apata, and Oluyole Industrial Estate. The rainfall started at 16:40 continuing in intense torrents until 20:00, with intermittent drizzling until 23:00 late at night accompanied by wind speed as high as 65km/hr. as it was most intense during 18:10 and 19:20 where 75 percent

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(146.63mm) of the rain fell. This translated to an average rainfall intensity of 127.84 mm. The flooding resulting from the over 7-hour rainfall was so extensive and of such a magnitude causing unprecedented loss of lives and damage to properties physical infrastructures, waterworks, buildings, roads, bridges, and culverts. As a result of this devastating flood, the Oyo state government came up with the Ibadan Urban Flood Management project funded by the World Bank with 200 million US dollars and a counterpart funding of 20 million naira from the Oyo state government. The project aims to develop, long-term resilience in the city by collaboratively identifying and implementing robust and sustainable solutions for mitigating flood risk and improving flood preparedness. On June 20th 2017, during the downpour, many houses including celestial church of Christ, Orogun, along U.I-Ojoo road were submerged and properties destroyed, areas heavily affected by the rain include Olodo, Oki, Akobo, Onipepeye, Kute, Eleyele and Ariyo.

The IUFMP aims to address the flooding challenges through various interventions, including constructing and rehabilitating drainage systems, river channelization, and implementing early warning systems. Additionally, the project includes community engagement and capacity-building initiatives to enhance the resilience of the local population to flood risks. These measures are anticipated to significantly impact the urban environment and socio-economic conditions in Ibadan[18].

Against this backdrop, the focus of this study is to evaluate the Ibadan Urban Food Management Flood Project (IUFMP) a project embarked upon to mitigate flooding in Oyo state[17].

1.2 Statement of the Problem

Several reasons abound to explain the regular occurrence of floods in Ibadan in the last three decades. Pertinent of these is the prevalence of torrential rain storms, poor sewage

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management, and disposal, poor urban planning control as shown by unplanned layout, and public apathy to environmental sanitation. All of these combined to make flooding a regular occurrence in Ibadan[13]. The issue of flood in Ibadan cannot be overemphasized as it has affected all aspects of the environment in the state including its agricultural sector. As a result of the recent floods a lot of loss was recorded in the agricultural sector. Based on the governments' assessment after the recent floods, the following impacts of the flood disaster have been highlighted; the housing sector suffered the biggest impact with about 2100 homes affected partially or severely, estimated to be approximately 2 billion naira. The agricultural sector experienced damages to infrastructure, fish, and food stocks estimated to be over 300 million. Substantial damages occurred to the transport sector particularly bridges and culverts, estimated to have cost more than 4 billion naira. The water sector including the Eleyele dam experienced substantial damages and losses[14].

In literature, the impact of flood and its risk on property values have been categorized into three headings namely; effect/impact of urban flood; pattern and trend of property values; and strategies for mitigating urban flood. In the quest to resolve the underlying issues of flood, its risk, and impact, scholars have carried out studies to look at the impact and effect flood and flood risk on property value and these authors have identified that flooding affects property values drastically[15,16,17,18].

Also, studies on the pattern and trends of property values have been carried out by some scholars and it was pointed out that environmental issues including flooding affect the pattern and trend of property value[19,20,21]. In another vein, studies have been carried out on flood management strategies and this was said to involve multiple engineering projects that can be classified under two headings namely soft engineering projects; and hard engineering projects[22]. It was identified that these flood management strategies have different impacts, advantages, and disadvantages.

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Putting together the above-mentioned studies, it is pertinent to note that majority have looked at the impact of flood on property values and also flood management strategies, but not on the impact of flood management projects on property values. Therefore, this current study seeks to examine the impact of urban flood management projects on property values in Ibadan, Oyo State.

The regular occurrence of floods over the last three decades in Ibadan can be attributed to several factors, including torrential rainstorms, poor sewage management, inadequate urban planning, and public apathy towards environmental sanitation. These issues have led to significant impacts across various sectors, with severe losses reported in housing, agriculture, transportation, and water infrastructure. Despite extensive research on the effects of flooding and flood risks on property values, as well as flood management strategies, there is a notable gap in examining the impact of urban flood management projects specifically on property values[19].

While numerous studies have investigated the effects of flooding on property values and explored various flood management strategies, there is a lack of research focused on how flood management interventions influence property values[,20,21,22,23,24,25]. This gap in the literature highlights the need for a comprehensive analysis of the effectiveness of flood management projects in mitigating the negative impacts of flooding on property values.

The purpose of this study is to examine the impact of urban flood management projects on property values in Ibadan, Oyo State. By addressing this gap, the study aims to provide insights into the effectiveness of these interventions in enhancing property values and contributing to urban resilience against flooding.

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1.3 Aim and Objectives of the Study

The aim of this study is to explore the impact of Ibadan urban flood management project interventions on property values to provide information that could enhance sustainable property investment in the emerging Nigerian economy. The specific objectives are to:

i. examine the social-economic characteristics of the projects' stakeholders in Ibadan Nigeria,

ii. assess the projects' profile and flood management strategies put in place for mitigating flood risk in the study area

iii. determine the pattern/trend of property values in the study area, between 2012 and 2022

iv. examine the impact of urban flood management on the values of properties in the study area

1.4 Research Questions

1. What are the socio-economic characteristics of the projects' stakeholders in Ibadan, Nigeria?
2. What are the projects' profile and flood management strategies put in place for mitigating flood risk in Ibadan, and how effective are they?
3. What is the pattern and trend of property values in Ibadan between 2012 and 2022?
4. How has urban flood management affected the values of properties in Ibadan?

1.5 Significance of the Study

This study was conducted among selected flood management projects of IUFMP, which have been completed in Ibadan, Oyo State, to determine the impact of flood management on value

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of properties. The study will assist real estate surveying firms and investors in properties identify the impact of flood management on property values.

The study provides useful information for professionals and investors in an emerging Nigerian economy like Ibadan. Such information could enhance the sustainability of real estate investment. Studying the impact of flood management interventions on property prices sheds light on the financial advantages of these kinds of initiatives. Enhanced property values can serve as a justification for flood management activities by signaling a favorable opinion of enhanced infrastructure and decreased risk.

The study's verdicts can help legislators and urban planners create efficient flood control plans. Prioritizing and allocating resources more effectively for upcoming initiatives might be aided by understanding the economic impact of these actions. The research underscores the wider advantages of flood control measures beyond mitigating flood damage by establishing a connection between these enhancements and property prices.

Evaluating the impact of flood management interventions on property prices is a useful step toward determining the financial advantages of these initiatives. If better flood control results in higher property values, this suggests that these interventions are beneficial to the local real estate market and may even draw in outside capital.

It also contributes to the existing body of knowledge on the impact of flood management on property values, because limited research has been conducted on the subject matter.

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1.6 Scope of Study

This study examines the impact of flood management on property values in Ibadan, Oyo State and will particularly focus on the completed flood management intervention projects of the Ibadan Urban Flood Management Project to explore their impact on property values to

provide information that could enhance sustainable property investment in the emerging Nigerian economy.

The City of Ibadan is located in southwestern Nigeria. It is the capital of Oyo State and is reputed to be the largest indigenous city in Africa, south of the Sahara. Ibadan is centered about Latitude 7^0 25' North and Longitude 3^0 5' East approximately 145 kilometers north of Lagos. Ibadan is directly connected to many towns in Nigeria and its rural hinterland by a system of roads, railways, and air routes. Ibadan was established by Lagelu after the destruction of the first settlement near Awotan in the neighborhood of Apete in Ido Local Government area. The presence of hills makes the site of the city easily defensible while its location close to the boundary between forest and grassland makes it a melting point for people and products of the forests as well as those of the grassland areas. However, Ibadan was resettled in about 1820 as a camp by soldiers of Ife, Ijebu and Oyo. Ibadan is considered to be the largest indigenous city in tropical Africa. Since its founding in the1800s, Ibadan has been an important rallying point for people in the south-west of Nigeria. Arising from its historical and administrative position in Nigeria, Ibadan has continuously witnessed influx of people which has contributed to its rapid growth both in population and physical expansion/land coverage. The population of Ibadan is estimated to be about 2,550,593 according to 2006 estimates by the National Population Commission. Its projected population by 2010 using 3.2% growth rate is about 2,893,137. In terms of physical expansion and land coverage, this pre-colonial urban center has expanded very fast sprawling daily into the hinterland.

Ibadan lies mostly on lowlands which are punctuated by rocky outcrops and series of hills. These are mainly of granite. Three major landforms of hills, plains and river valleys dominate the area. The average elevation is 230 m above mean sea level. The major rivers that drain the landforms are Ona, Ogbere, Ogunpa, Omi, Kudeti, Alaro, and Alapata. This combination

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of hills and river valleys provides good drainage for the city but it has suffered a lot of abuse due to blockages by solid wastes on and along the water courses coupled with the construction of structures along the river courses and sometimes right within the river course itself. These practices constitute the major reasons for the incessant flooding occasioned by the recent flood disaster on the night of 26th August 2011.

Ibadan is drained by three important rivers, R. Ogunpa, R. Ona and R. Ogbere. There are several tributaries of these rivers. The major tributary of R. Ogunpa is the R. Kudeti, both of which drain the eastern part of Ibadan. The western part of the city, which consists of more recent residential and other developments, is drained by the R. Ona and its numerous tributaries, including the Alalubosa, Oshun and Yemoja streams.

Oyo State exhibits the typical West African Monsoon climate marked by distinct seasonal shifts in wind patterns. Between March and October, the city is under the influence of moist maritime south-west monsoon winds which blow inland from the Atlantic Ocean, marking the- rainy season. The dry season occurs from November to February when the dry dust-laden winds blow from the Sahara Desert. The area experiences high relative humidity and generally two rainfall maxima regimes during the rainfall period of March to October. The mean temperatures are highest at the end of the Harmattan (averaging 28°C), that is from the middle of January to the onset of the rains in the middle of March. Even during the rainfall months, average temperatures are relatively high, between 24°C and 25°C, while annual fluctuation of temperature is about 6°C.

Most areas of the city are covered by the rain forest and derived savannah. Growth and development have, however, led to significant loss of vegetation. The wetlands are also being threatened by expansion into the wetlands and rural areas. The thick, low-lying, forests

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aggravate the spread of water as observed in areas like Ajibode, NIHORT and Oke Ayo along the course of River Ona.

Layout of the study

The study comprises five chapters. In the first chapter, the background to the study is introduced, the statement of the problem of the study is established and also the research questions and the aim and objectives are given. The second chapter presents a review of the literature while the third chapter presents the methods to be employed in carrying out the research. The fourth chapter presents the results and discussion while the fifth chapter deals with the presentation of the summary of findings, conclusion, and recommendations.

1.7 Limitation of the Study

This study on the impact of the Ibadan Urban Flood Management Project (IUFMP) on property values in selected areas of Ibadan, Oyo State, acknowledges several limitations that may have influenced its findings and interpretations. However, these limitations do not undermine the study's overall outcome, ensuring its credibility and validity.

Firstly, the study's scope is limited to specific project areas within Ibadan, which may restrict the generalization of findings to broader contexts or other urban settings. Variations in socio-economic, environmental, or infrastructural factors in different regions could lead to different outcomes, warranting caution when applying these results beyond the selected areas.

Secondly, the reliance on professional perspectives from within the IUFMP introduces a potential bias. While these insights provide valuable expertise, they reflect a specific viewpoint within the project team. The inclusion of both quantitative data from residents and

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agents, alongside qualitative data obtained through interviews and thematic analysis, offers rich insights but lacks the statistical rigor associated with purely quantitative methods. The mixed-method approach, though comprehensive, presented challenges in converging responses from different groups. Nonetheless, these limitations do not detract from the study's overall aim.

Additionally, the study focuses primarily on property values without extensively exploring other influential factors in the real estate market, such as market dynamics, economic trends, and external influences like inflation, material prices, and government taxes. While this narrows the scope of the findings, it does not diminish the study's contribution to understanding the relationship between flood management and property values.

Lastly, the temporal aspect of the study may be seen as a limitation. The research offers a snapshot of the project's impact within a limited timeframe, with many projects only completed in 2023. As such, it may be too early to fully assess the long-term impact on property prices. Continuous monitoring and evaluation will be necessary to capture long-term trends and the evolving nature of urban development.

In conclusion, despite these limitations, the study provides valuable insights into the impact of the IUFMP on property values. The limitations do not negatively affect the overall outcome, maintaining the study's credibility and validity. Future research should consider expanding the geographical scope, incorporating diverse perspectives, employing mixed methods, and conducting longitudinal analyses to offer a more comprehensive understanding of urban flood management projects and their influence on property values.

1.8 Operational Definition of Terms

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Flood Management Strategies: Approaches to mitigate the impact of floods, including both soft engineering projects (e.g., community engagement and capacity building) and hard engineering projects (e.g., construction and rehabilitation of drainage systems).

Flood: An environmental damage caused by an overflow of a water body that can result in significant harm to the environment, property, and human life.

Flooding: A global phenomenon characterized by abnormally large volumes of water in areas that are usually dry, leading to significant environmental and socio-economic impacts, particularly in urban settings.

Ibadan Urban Flood Management Project (IUFMP): A project initiated by the Oyo State government and funded by the World Bank and the Oyo State government, aimed at mitigating flood risk in Ibadan through various interventions, including drainage system construction and rehabilitation, river channelization, and the implementation of early warning systems.

Inadequate Urban Planning: Poorly designed urban layouts and lack of proper control measures that exacerbate the impact of flooding in urban areas.

Natural Disasters: Environmental events, such as floods, that have significant adverse effects on the physical, economic, social, geographical, psychological, and cultural aspects of human life.

Poor Sewage Management: Inefficient or inadequate systems for managing sewage, which contributes to flooding by clogging drainage channels and reducing the capacity to manage large volumes of water.

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Property Values: A critical indicator of economic vitality and urban development, reflecting the desirability, safety, and overall quality of an area. In Ibadan, property values are significantly influenced by factors such as recurrent urban flooding.

Public Apathy Towards Environmental Sanitation: Lack of public concern and proactive measures to maintain cleanliness and proper waste management, which can contribute to urban flooding.

Torrential Rainstorms: Intense and heavy rainfall events that are a primary cause of flooding, particularly in regions with inadequate drainage systems and poor urban planning.

Urban Flood: The overland flow of water in urban areas, such as streets, which is sufficient to cause significant property damage, traffic disruptions, health hazards, and loss of valuable assets.

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Endnotes

1. O., Adekola, J., Lamond, I., Adelekan, & E.B., Eze. *Evaluating flood adaptation governance in the city of Calabar, Nigeria.* **Climate and Development,** 12(9), 2020, pp.840-853.

2. A.J., Echendu. *Relationship between urban planning and flooding in Port Harcourt city, Nigeria; insights from planning professionals.* **Journal of Flood Risk Management,** 14(2), 2021, p.e12693.

3. O.I., Lawanson, D., Proverbs, & R.L., Ibrahim. *The impact of flooding on poor communities in Lagos State, Nigeria: The case of the Makoko urban settlement.* **Journal of Flood Risk Management,** 16(1), 2023, p.e12838.

4. National Emergency Management Agency (NEMA), 2012.

5. A., Echendu, & N., Georgeou. '*Not going to plan': Urban planning, flooding, and sustainability in Port Harcourt city, Nigeria.* In Urban Forum. Dordrecht: Springer Netherlands. Vol. 32, No. 3, 2021, pp. 311-332.

6. S.A., Mashi, A.I., Inkani, O., Obaro, & A.S., Asanarimam. *Community perception, response and adaptation strategies towards flood risk in a traditional African city.* Natural Hazards, 103, 2020, pp.1727-1759.

7. G.T., Cirella, F.O., Iyalomhe, & P.O., Adekola. *Determinants of flooding and strategies for mitigation: Two-year case study of Benin city.* **Geosciences,** 9(3), 2019, p.136.

8. National Population Council (NPC). *Report on Nigeria national population census on 2006 census.* Abuja: NPC, 2022.

9. A.W., Butu, C.N., Emeribe, & E.T., Ogbomida. *Effects of seasonal flooding in Benin city and the need for a community-based adaptation model in disaster management in Nigeria*. **Nigerian Journal of Environmental Sciences and Technology (NIJEST)** Vol, 3(1), 2019, pp.112-128.

10. O.F., Kasim, B., Wahab, & M.F., Oweniwe. *Urban expansion and enhanced flood risk in Africa: The example of Lagos.* **Environmental Hazards,** 21(2), 2022, pp.137-158.

11. M., Poku-Boansi, C., Amoako, J.K., Owusu-Ansah, & P.B., Cobbinah. *What the state does but fails: Exploring smart options for urban flood risk management in informal Accra, Ghana.* **City and Environment Interactions,** 5, 2020, p.100038.

12. O.H., Okunola, & P.O., Olawuni. *Determinants of household flood resilience strategies in Kaduna Metropolis, Nigeria.* **Urban Climate,** 44, 2022, p.101216.

13. R.I., Ogie, C., Adam, & P., Perez. *A review of structural approach to flood management in coastal megacities of developing nations: Current research and future directions.* **Journal of Environmental Planning and Management,** 63(2), 2020, pp.127-147.

14. A.O., Abiri. *Assessment of flood risks in Ifo local government area of Ogun State.* **African Journal of Land Policy and Geospatial Sciences,** 4(4), 2021, pp.594-605.

Lead City University Ibadan DO NOT COPY

15. C.B., Okoye, & V.N., Ojeh. *Mapping of flood prone areas in Surulere, Lagos, Nigeria: A GIS approach.* **Journal of Geographic Information System,** 7(2), 2015, pp.158-176.

16. F.N., Buba, O.C., Ojinnaka, R.I., Ndukwu, G.I., Agbaje, & Z.O., Orofin. *Assessment of flood vulnerability in some communities in Lokoja, Kogi State, Nigeria, using participatory geographic information systems.* **International Journal of Disaster Risk Reduction,** 55, 2021, p.102111.

17. M.A., Oni, & S., Ayegba. *Environmental policies, agencies and flood management in selected states in Nigeria (2005-2021): The gaps and the challenges.* **KIU Journal of Humanities,** 7(2), 2022, pp.51-62.

18. A., Ebekozien, C., Aigbavboa, M.S., Samsurijan, R.B., Radin Firdaus, & A., Salman. *Appraising flood resilience technologies role in developing cities: How prepared is the professional stakeholder?.* **International Journal of Construction Management,** 24(7), 2024, pp.683-692.

19. D.A., Dawson, K., Vercruysse, & N., Wright. *A spatial framework to explore needs and opportunities for interoperable urban flood management.* **Philosophical Transactions of the Royal Society A,** 378(2168), 2020, p.20190205.

20. A.J., Echendu. *Human factors vs climate change; experts' view of drivers of flooding in Nigeria.* **Natural Hazards Research,** 3(2), 2023, pp.240-246.

21. S.S., Danhassan, A., Abubakar, A.S., Zangina, M.H., Ahmad, S.A., Hazaea, M.Y., Ishak, & J., Zhang. *Flood policy and governance: A pathway for policy coherence in Nigeria.* **Sustainability,** 15(3), 2023, p.2392.

22. A.O., Yoade, V.A., Onifade, & T.P., Olajide. *An assessment of public perception of flooding in Akure, Nigeria.* **International Journal of Development and Sustainability ISSN**, 2019, pp.2186-8662.

23. A.J., Echendu. *Flooding, food security and the sustainable development goals in Nigeria: An assemblage and systems thinking approach.* **Social Sciences,** 11(2), 2022, p.59.

24. V., Oladokun, D., Proverbs, O., Adebimpe, & T., Adedeji. *Handbook of flood risk management in developing countries.* In Handbook of Flood Risk Management in Developing Countries, Routledge 2023, pp. 1-5.

25. D.A., Week, C.H., Wizor, & O.S., Eludoyin. *Assessment of community's resilience to flooding in the flood-prone areas of the core Niger Delta, Nigeria.* **J. Geogr. Environ. Earth Sci. Int.,** 23(4), 2019, pp.1-13.

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Chapter Two

Literature Review

2.1 Conceptual Review

Literature on property values as regards flood and flood management is sparse; however, the expectation from this study is that the implementation of the urban flood management project in flood prone areas in Ibadan would impact property values in such areas. This section of the study highlights the concepts of flood and flood management as well as factors affecting property value. It also examines related factors that previous studies have identified to have an impact on property values. The Ibadan Urban Flood Management Project, an agency of the Oyo State government will also be discussed. This is to relate the findings with the ongoing study.

2.1.1 Flood

As earlier stated, flood is a great flow of water; an inundation; a deluge; or a condition of abnormally great flow in a river[1]. However, flood mean different things to different people. Equally there are many ways of categorizing floods. A source might be heavy rainfall or high tides, a pathway might be a river or overland flood and a receptor could be a house, field or factory[2,3]. For the purpose of this study, a simplified grouping of flood types is practical while recognizing that many flood events may combine more than one type. The Environment Agency (EA) definitions of the flood events of 2000 cited in National Audit Office categorizes flood as coastal and estuarine flooding, fluvial flooding and overland flooding (also known as pluvial flooding) [4]. There are six types of flooding: coastal flooding, river flooding, urban flooding, dam burst levee failures, dam spills and flash flooding[5,6,7].

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2.1.1.2 Causes of Flooding

Since the start of history, the world has been plagued by natural disasters[8,9]. An extreme natural event only becomes a natural disaster when it has an impact on human settlements and activities. There is a strong social as well as natural science component to natural disasters and while the events themselves cannot be prevented, their disastrous consequences can often be reduced by appropriate planning and the preparation of emergency measures on the part of the community at risk[10].

From a geological perspective, floods are a natural consequence of stream flow in a continually changing environment[11]. Floods have been occurring throughout earth history, and are expected so long as the water cycle continues to run. Streams receive most of their water input from precipitation, and the amount of precipitation falling in any given drainage basin varies from day to day, year to year, and century to century[12]. The author went ahead to identify the causes of flood as; sea level rise, subsidence and compaction of sediments, riverbed aggradation, soil erosion due to tilling, excessive development, damming of rivers, seismic (earthquake) and geotectonic activities and greenhouse effects. Some causes of flood in developing nations as unregulated developments, invasion of public areas, lack of institutional capacity at municipal level, unrealistic regulations, economic pressures from developers, ineffectiveness of planning regulation by allowing development on flood plains and poor and lack of standard drainage system on roads[13]. Causes of flooding has been grouped as natural causes such as heavy torrential rains or storm, ocean storms and tidal waves, usually along the coast and blockade of river or drainage courses by waste and the second being human causes such as lack of meteorological data for weather forecasting, burst of main pipes, dam burst/levee failures, dam spills, property development along river setbacks and indiscriminate waste disposal[14]. The causes of floods in Ikoyi and Victoria Island, Lagos areas as excessive rainfall, faulty drainage designs, blocked drainage channels

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by refuse and sediments, obstruction by buildings and inadequate drainage heads to make the drainages efficiently drain off storm water[15]. The study examined the efficiency of some drainage channels in the face of tidal waves, sea level rise and other human activities.

2.1.1.3 Urban Flooding in Ibadan

The majority of displaced families have been forced to seek shelter in schools, uninhabited buildings, tents, or with faraway family members, some of whom have left all of their possessions behind, as the recent flooding in Kogi state continues to devastate various communities, including the State's Capital.

The 2012 floods were among the worst in Nigeria, resulting in the loss of lives and assets worth millions of naira. The floods were astounding, and regardless of the fact that floods occur on a yearly basis in the country, the government appears to lack the capacity to deal with a disaster of this magnitude. Organizations and individuals joined forces together with the government to help victims by donating relief items and providing temporary housing[16]. It was further noted that floods and natural disasters are expected to increase in the coming years due to climate change, and there is a need to determine flood management approaches used by farmers and the government in the aftermath of the 2012 floods[17]. Farmers use practices such as planting resistant trees/varieties, building manual embankments, and using indigenous knowledge, according to the study. In addition, the Nigerian government established early warning systems to warn farmers of impending floods. The author stated that more should be done to educate and encourage farmers to use early warning systems, relocate farmers from flood-prone areas, and encourage farmers to insure their crops[17].

The impacts of a flood disaster on homes close to the floodplain can be estimated using the hedonic price method[18]. One of the regions in Nigeria affected by the 2012 flood disaster was Lokoja, which was used in the study[19]. The study's findings revealed that properties in

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floodplains have an average value reduction of N 493, 408, or 6.8 percent, compared to properties outside of floodplains. According to the findings, residents of flood-prone areas and property owners are becoming more aware of the inherent risk involved. According to the study, there should be a national disaster insurance policy to care for the victims of disasters.

The flood disaster in Ibadan, Nigeria, was examined for vulnerability[20]. In the areas of Ibadan known as Apete and Eleyele, the authors emphasised the risk of flooding. Due to the size of hazard flood events and the unpredictable nature of floods, the authors noted the need for an efficient risk mapping and risk management strategy to reduce the flooding problem[21]. According to the study, if Nigeria's government gives environmental issues (protection, monitoring, and control) a high priority and takes immediate action to address them, flood risk management can be successful in the country. The authors suggested that environmental teaching programmes (public education) on climate change, flood risks, and appropriate response strategies be implemented at all levels (community, local, state, and national levels): It is possible to lessen the harm caused by extreme weather events and the requirement for government relief funding by investing in communities that are vulnerable to the effects of climate change. For a healthy environment, it is crucial to raise awareness among those who live near waterways. Additionally, publicity about the dangers of encroaching on flood plains can take the form of printouts from newspapers, electronic media, as well as dramatizations and plays. Promoting and facilitating a culture of flood resilience improves residents' ability to prepare individually and as a community[21]. An empirical study investigated how Kano State's Korentabo community was affected by flooding. As pointed out in the study, flooding poses a serious threat to locals' quality of life and health. According to the findings, there have been more floods in the past few years, which has cost locals hectares of land, livestock, and threatened their ability to provide for themselves as well as their neighbours' lives and

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health[22]. The study recommends that, in the event of future floods, flood disaster preparedness be improved by raising community members' awareness and educating them about the risks involved.

2.1.1.3 Flood Management Strategies

Causes of flood has been identified to be due to unregulated developments, invasion of public areas, lack of institutional capacity at municipal level, unrealistic regulations, economic pressures from developers, ineffectiveness of planning regulation by allowing development on flood plains and poor and lack of standard drainage system on roads[23]. In the study the causes of flooding were grouped as natural causes such as heavy torrential rains or storm, ocean storms and tidal waves, usually along the coast and blockade of river or drainage coursed by waste and the second being human causes such as lack of meteorological data for weather forecasting, burst of main pipes, dam burst/levee failures, dam spills, property development along river setbacks and indiscriminate waste disposal[24]. In developing management strategies to mitigate against this, it was identified that flood management strategies involve hard Engineering projects and soft engineering projects[25]. It was further stated that *hard engineering* projects includes those that involve the construction of artificial structures that, through a combination of science, technology and a bit of brute force, prevent a river from flooding and these includes dams, artificial levees, channel straitening, diversion spillway; while soft engineering projects are those projects that use natural resources and local people's knowledge of the river to reduce the risk posed by a flood e.g. floodplain zoning, afforestation, wetland restoration, river restoration . Furthermore, he concluded that both flood management strategies have their pros and cons as hard engineering is capital, technology and maintenance intensive and can disrupt the ecological system. On the other hand, soft engineering focus more on reducing the impacts of a flood rather than preventing one[26]. Also, as recorded flood management strategies was categorized into small scale

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engineering schemes and large scale engineering shames[27]. It was recorded that small scale engineering schemes includes, river training and works design to prevent local bank erosion, while large scale engineering works are flood embankments, channels enlargement, flood relief channels, flood storage reservoirs and wash land schemes[28,29].

The flood management strategies were categorized into structural components, non-structural components and the early warning systems. the structural components includes drainages, culverts, bridges, and the non-structural components includes, city master plans, drainage master plans that list and plans for management of structural component, while early warning systems are flood forecast technology that prompts on an occurrence of flood[30].

2.1.1.4 Government Intervention and Management of Flooding

Most developing countries have established laws and formal government structures to address their serious environmental problems, but few have succeeded in alleviating these problems[31]. Flood disasters always result in the loss of lives, the destruction of public utilities, and the disruption of system functioning, causing fear and uncertainty among the populace[32]. As a result, flooding has become a national issue in Nigeria, affecting various sectors of the economy and causing massive losses, stifling development[33]. Nigeria's vision of being among the first twenty nations with a leading economy by 2020 may be a figment of the imagination if lives and assets are not secured from the country's frequent floods[34]. Flooding in Nigeria is not only a result of climate change; the Nigerian government's structure has also helped contribute to several of the issues that have led to flooding[35]. Environmental legislation, for example, is poorly enforced in Nigeria. There are no clear lines of distinction between agencies, the federal government, and state ministries[36]. In Ibadan, the case study for this survey, it has been discovered that the laws and policies guiding development in the Ibadan metropolis, in terms of recognizing flood hazards, are generally inadequate to safeguard the

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masses from flooding[37]. In light of this, it is clear that the Nigerian state and federal governments must intervene to reduce flooding in urban areas. In contrast to the foregoing, it has been stated that Nigeria is in a distinct position to improve its natural disaster management framework by utilizing currently available information on natural disaster predictions threatening its territory as well as drawing on lessons learned from previous experience within and outside the country[38]. Government intervention should shift from post-disaster reaction or response to pre-disaster reaction or reaction[39]. This implies that national authorities should shift their focus from flood relief (money and materials) to preventative measures and mitigation. This is evident in the IUFMP initiative, the goals of which are centered on flood mitigation. Successive governments in Oyo state, the capital of which is Ibadan, have devised a number of measures aimed at preventing and managing flooding in the city, particularly along the Ogunpa River[40]. One of the most notable measures to date is the Ogunpa river channelization scheme, which began in 1999 in collaboration with the Nigerian federal government.

It was also emphasized that beyond focusing on potential victims, the government can attend to the causes of disasters and take steps ahead of time to prevent or at least reduce their prevalence and severity[41]. In light of the foregoing, there is an urgent need for the government and stakeholders to work together to support town planners, engineers, and other professional agencies in their efforts to address flooding in Nigeria.

2.1.1.5 The Ibadan Urban Flood Management Project (IUFMP)

The Ibadan Urban Flood Management Project was an initiative of the Oyo State Government which was commenced in response to the 2011 catastrophic flood on the 26th of August, this step was taken to help prevent or reduce risk to the barest minimum. The city of Ibadan is the seat of the Oyo state government, yet it has been characterized by its perennial flooding

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which results in massive loss of properties, businesses and lives due to the water banks that are not capacitated enough to hold such mass of water. To put an end to the frequent losses, the World Bank assisted the state government in the project with the aim of mitigating against flood disasters and occurrence to the barest minimum[42].

The IUFMP is purposed to create the Ibadan Master Plan and see to the construction and reconstruction of functional, modern and standard flood control systems dredging of rivers and creating awareness among the people against poor waste or rehabilitating bridges and culverts. The project was able to set up an automated system, 'an Integrated Flood Early Warning and Response System", which helps to create alarm of possible flood areas and suggest responses. This makes the IUFMP a holistic and complete system where prior warning is made about flood prone areas and suggested deliverance or response strategies. Meanwhile, before the alarm is made, provisions are already in place to control the floods. It is expected that at the latest time, residents of flood prone areas would be notified 6hours before the disaster to make room for successful evacuation of families, residents and save some properties from destruction[43].

Two control towers have been built to implement, manage, monitor and control the flood warning system and flooding in the city of Ibadan, the control towers are located in the Ministry of Environment and the state emergency management authority (SEMA). Additional six control stations were built across the city in the National Institute of Horticulture (NIHOT), Ministry of Environment, Kings College, Airport, Cocoa research Institute of Nigeria (CRIN) and finally at Idi Ayunre. Also, gauges will be placed in 11 major rivers and streams which will start sirens to raise alarms at Police stations, Churches and Mosques in areas of flood possibilities. The underlying principle is that flood cannot be totally prevented but the destructions can be mitigated to the barest minimum, hence the early warning signs (EWS) of the IUFMP. Combining modern technology and state of the art engineering and

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construction, the IYFMP is set to ensure that disasters due to flood are drastically reduced or prevented[44].

2.1.2 Property Values

The concept of rent encompasses the regular monetary disbursement made by a tenant to a landlord, serving as compensation for the privilege of utilizing a designated property[45]. Also, from an economist's perspective, it can be argued that rent or purchase price serves as the remuneration for the utilization of land and landed resources. The value of a property refers to the equitable market value that it commands when it is leased out to a tenant or sold out rightly. In a broader context, one may posit that it pertains to the remuneration rendered in exchange for the privilege of inhabiting a leased space, or the compensatory sums or proceeds acquired by a lessor through the licensing of tangible immovable assets, or remuneration for an outright sale of same[45].

2.1.2.1 Factors Affecting Property Values

Real property has no value if it has no utility, not scarce and not effectively demanded. Real property has significance only as it satisfies man's needs and desires. It is this man's collective desire for real property that gives rise to value[46]. Thus, the ability of a property to satisfy man's needs and desires together with its degree of scarcity and utility compared with others makes man to ascribe value to it. Property value, therefore, is the money obtainable from a person(s) willing and able to purchase property when it is offered for sale by a willing seller, allowing for reasonable time for negotiation and with the full knowledge of the nature and uses which the property is capable of being put[47]. Real property is a heterogeneous good that is comprised of a bundle of unique characteristics reflecting not only its location, but equally affected by other amenities such as the quality of neighborhood and infrastructure[48,49].

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Property value is an essential aspect of property markets worldwide and determined by a variety of factors and the determination of those factors is a significant part of property valuation[50]. The list of the main factors affecting property values from various studies include; age, location, size and neighborhood characteristics, economic activity, population and transport and others[51]. The variables determining property values were grouped into; environmental variables, neighborhood variables, accessibility (location) variables and property variables[52].

On country basis, the studies carried out in UK showed that location, level of income, interest rates and population are the major factors affecting property values[53]. While in United States of America, the studies conducted showed that the main factors influencing property values are: number of employments, age composition of the population and rate of household formation. On the other hand, the studies in New Zealand revealed that property values are mostly influenced by the level of income, construction activities, economic activities, lot size, age of the house and other property characteristics[54]. The Nigeria situation is not too different from that of the UK, the major factors influencing property values in the UK, among others, are location, plot size and income, interest rate and population[55]. Various earlier studies had been conducted on the effect of location on property values. Their various findings agreed that location is a major determinant of property value also that location is important in relation to proximity to the target market and sources of supplies; conditions and facilities are important in relation to attracting optimal rentals, and security is important in relation to tenant and visitor safety[56,57]. However, these studies ignore the effects of other factors (variables) in the determination of property values. The effect of location on residential house prices was conducted using the Ordinance Survey of Northern Ireland data and conclude that location and structural characteristics are the key determinants of residential property values[58]. Some set of attributes that have been commonly used in property valuation research including

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accessibility factors, neighborhood level factors, specific negative externalities, public services, taxes and density factors[59].

Four categories of attributes were identified in research, namely; structural, physical, neighborhood and environmental, for measuring residential property values, using hedonic equation in Hong Kong[60]. Similarly, Chau, the effect of balconies on the residential property values in Hong Kong and found a positive effect on the value of a property irrespective of the quality of the view[61]. Seven factors were identified that affect property values, these factors are; population (increase or decrease), changes in fashion and taste, institutional factors (these are factors relating to people's culture, religious belief and government action), technological factors, economic factors, location and complementary uses[62]. These factors were defined under three major groups as external factors, internal factors and economic factors[63]. The external factors include location and accessibility, internal factors include the individual features of the property such as number of bedrooms, plot size, garage, number of toilet, and so on, economic factors include individual's purchasing power, the level of interest and inflation rates in the country[63,54].

There exist considerations for property value that hinge on the property's ability to produce income, be in demand and have a good location relative to its use, it identifies other determinants of value to include scarcity, prospect of income growth, state of the economy, cost in use, government and political factors, physical attributes and taxation[65].

2.1.2.3 Property Valuation and Property Values

As per Millington's assertion in a seminal work, valuation can be defined as the intellectual pursuit or systematic inquiry aimed at determining the worth, with a specific objective in mind, of a distinct stake in a property at a precise juncture, while duly considering all the attributes inherent to the property itself, as well as meticulously contemplating the

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comprehensive economic variables of the market, encompassing the gamut of alternative investment opportunities[66]. Valuation is commonly acknowledged to encompass elements of both scientific and artistic disciplines, as it necessitates a discerning blend of intuition and experiential analysis of market data in order to formulate an informed assessment of value[67]. In the seminal work, it provided a comprehensive definition of real property[68]. Real property was said to encompass a wide range of interests, benefits, encumbrances, and rights that are intrinsically linked to the ownership of tangible real estate. The term "real estate" itself refers to the land itself, along with any permanent improvements that have been affixed to it, as well as any associated appurtenances. This definition serves as a fundamental framework for understanding the complexities and nuances of the concept of real property. The authors additionally proposed that the assessment of the worth of real estate is thus necessary in order to furnish a quantitative evaluation of the advantages and drawbacks arising from the possession of said real estate. The definition espoused by the International Valuation Standards Council (IVSC) pertains to the estimated value assigned to the exchange of an asset or liability between discerning and cooperative entities, which duly takes into account the respective interests of said parties[68].

Valuation in Nigeria is a professional practise overseen by the Estate Surveyors and Valuers, who are subject to the regulatory oversight of two governing bodies. These bodies include the Nigerian Institution of Estate Surveyors and Valuers (NIESV), which was established in 1969 and legally incorporated under the land Act Cap. 98 Laws of Nigeria on June 1st, 1970. The recognition of the Institution was subsequently formalized in 1975 through the enactment of Decree No. 24 of 1975, which has since been codified as an Act under CAP III of the Laws of the Federal Republic of Nigeria[69].

The subject of discussion pertains to the Estate Surveyors and Valuers' Registration Board of Nigeria. The Board, herein referred to as the governing body, was officially instituted in the

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year 1975 through the enactment of Decree No. 24, with the primary objective of overseeing and controlling the profession of estate surveying and valuation within the jurisdiction of Nigeria[69].

In the context of a valuation exercise, it is imperative to make certain decisions prior to commencing the exercise. The determination of these decisions shall emanate either from the client or the valuer. The determination of the purpose of valuation lies within the purview of the client, whereas the valuer assumes the responsibility of ascertaining the foundation and approach of valuation to be employed. The aforementioned decisions must have been made prior to the completion of a successful valuation exercise[70].

2.1.2.4 The Purpose of Valuation

The selection of the appropriate valuation methodology is contingent upon the specific purpose for which the valuation is being conducted. The significance of valuation is paramount in determining the appropriate methodology to be employed in property valuation. This methodology shall facilitate the valuator in reaching a justifiable market valuation for the subject property being appraised. The ease of valuation is enhanced when the purpose is clearly understood[71].

Valuation serves various objectives, encompassing a range of purposes such as sales and purchase, Mortgage or Loan Security, Rating/ Taxation, Probate purpose, Insurance, Rental purpose, Going-concern purpose, Business Enterprise, Account/ Balance sheet/ Financial Report, Development/ Redevelopment, Compensation/ Compulsory Acquisition, Merger/ Takeover, and Commercialization/ Privatization[72].

These must be determined before a valuer could go on with the valuation exercise of any property as they give the basis for carrying out valuation.

2.1.2.5 The Basis of Valuation

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The basis of valuation, as earlier stated, is the duty of the valuer to determine, and this depends on the purpose of the valuation. This must be determined before the method of valuation to be adopted. Some of the basis of valuation used is are Open Market basis, Forced sale Value or Fair Market, Insurable Value, Ratable Value or Assessed Value, Investment Value, Compensation Value[73].

A comprehensive framework for identifying and categorizing the bases of valuation was delineated and this is put forward[74].

1. Market value refers to the estimated value at which an asset or liability could be exchanged on a specific valuation date. This exchange would occur between a buyer and a seller who are both willing participants in the transaction, and it would take place under fair market conditions. Furthermore, the transaction would involve proper marketing efforts and the involved parties would demonstrate knowledge, prudence, and absence of any external pressures. In the following section, we will delve into the intricacies and nuances of the topic at hand, shedding light on various aspects that warrant careful[75].

2. Market Rent refers to the projected value at which a stake in tangible property ought to be rented out on the date of assessment. This transaction would occur between a lessor and lessee who are both willing participants, under suitable lease conditions, in a transaction conducted at a fair distance from any personal or financial influence. Additionally, both parties would have demonstrated a reasonable level of knowledge, prudence, and autonomy in their decision-making process.

3. Equitable Value, as defined in the context of this discourse, pertains to the estimated monetary worth assigned to the transfer of an asset or liability. This valuation is predicated upon the involvement of identified parties possessing substantial

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knowledge and a willingness to engage in said transfer. Moreover, the equitable value is intended to encapsulate and duly account for the respective interests held by the aforementioned parties. Equitable value necessitates the evaluation of a justifiable price between two distinct and identifiable parties, taking into account the relative benefits or drawbacks that each party will accrue from the transaction. In contradistinction, the concept of Market Value necessitates the exclusion of any benefits or detriments that are not accessible to, or borne by, participants in the market at large.

4. The concept of investment value, as delineated in Section 60, pertains to the intrinsic worth or value that an asset holds for its proprietor or a potential proprietor, with regards to their individual investment or operational objectives.

5. Synergistic value is a phenomenon that arises from the amalgamation of multiple assets or interests, wherein the resultant value surpasses the mere summation of the individual values. If the presence of synergies is limited to a singular buyer, it follows that the Synergistic Value will deviate from the Market Value. This discrepancy arises from the fact that the Synergistic Value encompasses distinct characteristics of an asset that hold significance solely for a particular acquirer. The incremental worth surpassing the combined sum of individual interests is commonly denoted as "marriage value."

6. The concept of liquidation value pertains to the quantifiable amount that could be obtained through the sale of an individual asset or a collection of assets in a fragmented manner. The consideration of expenses associated with the preparation of assets for marketability, alongside the costs incurred during the disposal process, ought to be factored into the determination of the Liquidation Value. The

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determination of Liquidation Value can be undertaken within the framework of two distinct premises of value: (a) an orderly transaction characterized by a customary marketing period, or (b) a forced transaction characterized by a condensed marketing period[75].

The publication also enumerates several additional foundations of value that it refrains from providing explicit definitions[77]. It is worth noting that the majority of these bases are intricately linked to particular regulatory or legal concerns, with some being specific to certain countries. One of the foremost critical concepts in the realm of International Financial Reporting Standards (IFRS) is the notion of Fair Value. IFRS13 provides a definition for Fair Value, which is characterized as the monetary amount that would be obtained from the sale of an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date[76].

An asset or liability is deemed to be transferred or paid in an orderly transaction between market participants at the measurement date. Over 130 countries worldwide mandate or authorize the utilization of the International Accounting Standards for the purpose of financial reporting. The uniformity in the definition of Fair Value is observed within the United States through its adoption by the Financial Accounting Standards Board (FASB)[77].

Exchange Value Concepts

The predominant paradigm in property valuation is the Market Value approach. The concept under consideration pertains to the exchange price, which serves the purpose of determining the value at which a property interest is effectively transacted within an unrestricted market, wherein all participants are assumed to possess comprehensive knowledge and engage in voluntary transactions devoid of any external influence. A 2017 publication makes a clear distinction between it and the concept of fair value[78]. As previously mentioned, Fair Value, as

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per the International Financial Reporting Standards (IFRS), is delineated as the monetary amount that would be obtained from the sale of an asset or disbursed for the transfer of a liability in a methodical transaction between individuals operating within the market at the specific date of measurement. According to the RICS Global standards, it is indicated that the references made within the Accounting Standards (IFRS 13) regarding market participants and a sale explicitly establish that, for the majority of practical intents and purposes, the notion of fair value aligns with that of market value. Consequently, there would typically be no disparity between the two in relation to the valuation figure that is reported. A definition of market value was also put forward as an estimated value representing the interest or legal right an individual possesses in a property[79]. This value is derived from the potential benefits that can be obtained by utilizing the land and building in the most advantageous legal and potential manner.

2.1.2.6 Trend in Property Values

Numerous scholarly investigations have been undertaken pertaining to the dynamics of real estate valuation patterns within the contexts of both advanced and emerging economies, encompassing diverse temporal spans that encompass periods of economic expansion and contraction. Several studies were conducted, including one conducted in the United States (US)[80]. In this particular study, the author observed that the trends in rental values indicated a more rapid increase compared to the cost-of-living index, which specifically excludes housing costs in the US. A scholar conducted an analysis on the average rental values in the United States utilizing descriptive statistical methodologies. The study's findings indicate that there are statistically significant variations in the average growth rate of rentals throughout the various stages of the physical real estate's life cycle. Another investigation conducted centered around the analysis of the prevailing rental patterns within the residential real estate sector in Stockholm[81]. The study period under examination spanned from 1990 to 1997,

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encompassing a duration of eight years. The methodology employed encompassed the utilization of descriptive statistical techniques. The empirical evidence derived from the study elucidated a consistent upward trajectory in rental rates throughout the duration of the investigation. The aforementioned statement aligns with the research outcomes presented by some scholars[82]. A congruent investigation carried out in Ireland yielded results that align with the conclusions drawn by some researchers in their study[83].

Findings from the fluctuations observed in land prices serve as the primary determinant for the majority of the fluctuations witnessed in the trajectory of property prices within the United States during the period spanning from 1975 to 2006[84]. In another exploratory study conducted in New Zealand, the authors undertook the task of decomposing the historical trajectory of property price movements[85]. This decomposition was achieved by isolating and analyzing two distinct components: a trend component and a cyclical component. The utilization of a co-integration model was employed by the authors for the purpose of analyzing the data that was utilized within the confines of the study. The findings derived from the study indicate a robust growth in property construction prices throughout the duration of the investigation, thereby exerting a significant upward pressure on the overall expenditure associated with the development of new housing units. They undertook the construction of market-based real estate[86].

This study aims to comprehensively analyze the property price indexes pertaining to Manhattan between the years 1920 and 1939, with the primary objective of elucidating the prevailing property trends and cycles during this specific temporal domain. The study's findings elucidated a robust correlation between the valuation of high-end properties and the stock market during the designated period of analysis. Conducted A comparable investigation was conducted in Nigeria that evaluated the trajectory of rental values pertaining to commercial properties in Akure, Nigeria[87]. The data was gathered by the authors from estate

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surveying firms operating within the designated study area during the period spanning from 2006 to 2011. The study employed a methodology that encompassed the utilization of simple linear regression as well as Analysis of Variance (ANOVA). The empirical evidence derived from the study demonstrates a consistent upward trajectory in rental values over the entire duration of the investigation. Another study conducted a comprehensive analysis to assess the risk-return dynamics inherent in commercial real estate investments within the context of Osogbo, Nigeria[88].

The authors analyzed data spanning from 2002 to 2014, employing trend analysis and holding period formulae for their investigation. The study's findings indicate a consistent upward trend in rental/capital values, income, capital, and holding period returns for investments in shop and office property types within the Osogbo metropolis. In a study, an analysis was presented on the prevailing patterns observed in the residential real estate sector within the region of Gombe, Nigeria. The utilisation of both trend analysis and a regression model was employed by the author in the examination of the data utilised for the study. The data collection process encompassed the acquisition of relevant information from estate firms operating within the designated study area, spanning the temporal period from 2002 to 2014. The empirical evidence derived from the study indicates a persistent upward trend in the rental, capital, and return values of residential properties within the designated study area throughout the specified time frame[89].

2.2 Theoretical Framework

Flood in history have wrought great calamities to humans, destroying settlements, properties and causing great sufferings. Such destruction of human heritage and civilization should be viewed with concerned development experts. This is because sustainable development is aimed at striving for a better quality of life, not decrease or destroying it. In this concept, the

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proponent of Environmentalism which seeks to address the over superiority of our surrounding over every other thing should be considered. Flooding, Erosion, and other disasters are some of those natural concepts that should be avoided, managed and handled with great concern in view of the Environmentalism proponents. Therefore, it is expected that the urban flood management project embarked upon by the Oyo state government with the support of the World Bank would increase the livelihoods of the residents and the value of lands and properties in the area[90].

2.2.1. Hazus Flood Theory

The federal emergency management agency (FEMA) developed a software tool called Hazus for multi-hazard risk assessment and loss prediction and quantification. In order to assist municipalities in forming educated decisions and choices about land use and other concerns in flood-prone locations, the Hazus flood model is an embedded approach for recognizing and assessing flood risk. To quantify the structural, economic, and psychosocial consequences of natural disasters, GIS technology is used. It graphically depicts the boundaries of places with high flood, earthquake, and hurricane risk. Flood users would be able to provide solutions to the issue of flooding in a particular region if they learned to visualize the spatial relationships between populations and more enduring geographic assets or resources for the specific hazard being studied. The software, Hazus, helps to plan for contingencies and mitigating activities that can help flood managers to prepare for the occurrence in terms of evacuation, relief and rescue materials, human resources needed and so on[91].

2.2.2. Application of the Hazus Theory

The Hazus flood model is the best option for resolving the flooding issue utilizing Geographic Information System (GIS) and Remote Sensing due to the large population and

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events and other variables surrounding the flood in the Ibadan metropolis. The software is free for all and easy to use. Monitoring and controlling flood processes and patterns has benefited greatly from satellites' unique ability to offer comprehensive, panoramic and multi-temporal coverage of very broad areas at regular intervals[92,93]. Geographic information systems (GIS) and remote sensing innovative technologies are tools that can help environmental floodplain managers detect flood-prone areas in localities as well as other aspects like readiness and humanitarian and rescue management of flood disasters[94,95]. Hence, because to the enormous population, this approach is advised for the IUFMP as a more sophisticated way of mapping and resolving the different forms of difficulties involved in flood monitoring, administration and control. The software helps even the ordinary user to check if the land or landed property is on a flood prone area[96,97,98,99].

2.3 Review of Empirical Studies

Various scholars have researched on the impact of flooding on property values in different nations. In the United States of America existing studies have examined the impacts of both flood risk and a particular flood event on house prices. A consensus reached stated that flood risk lowers house prices after controlling for property attributes, location and neighborhood characteristics, although the magnitudes of price discounts vary[100,101]. A study compared means/medians of property values before and after the 1985 flood event in Yuba County, California, using simple t-tests[102]. They found that immediately after the flood event there was no property market in the flooded area and houses were sold in the next few months but at a lower price; as memories of the flood receded, the housing market picked up to better than pre-flood levels. These findings are based on a small sample size (62 properties) and no allowance was made for the differing characteristics between houses. However, the subsequent study in the year 2019, no significantly negative effect of flooding was reported. The relationship between flooding and residential property values was examined through

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repeat sales techniques, in three New Zealand communities, Te Paeroa, Te Aroha and Thames, differing reactions were found to the disaster in different communities[103]. For example, in Te Paeroa flood-free properties experienced a significant increase in prices following the flood event while those flooded did not. In Te Aroha the entire community experienced a decline in property values. In Thames city however, no price decrease existed. Another study in Pennsylvania, California and Illinois finds that selling prices fell following flood events but recovered to levels at or above pre-flood values; and the recovery period was shorter for places experiencing less severe flooding[104,105]. Three possible explanations exist to interpret the inconsistent results about the house price effects of a flood event. First, different socio-economic contexts and flood experiences may result in differences in people's perception of flood hazard and therefore market behavior of house prices[106]. If flooding occurs only rarely in an area and there is a long-time gap between two flood events, it is likely that house price falls immediately after a flood event and then recovers, as people tend to forget flood risks. If flooding occurs frequently, house prices may remain low as the market does not have enough time to recover between flood events. In this case, flood risks have been completely capitalized into house price and future flood has no impact on property values. A second explanation for the mixed findings in the literature is that sample sizes in some studies are too small to reach robust conclusions, for example most of them used less than 100 properties. A third explanation concerns different methods used by researchers in various studies. For example, some studies controlled for property attributes while others did not. Using the 1999 Hurricane Floyd as a natural experiment to analyze property prices of 8,375 homes between 1992 and 2002, it was reported that houses located within the floodplain were worth on average 5.7% less than a comparable property located outside of the floodplain[107]. This price discount doubled after Hurricane Floyd.

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In United Kingdom, the impact of flooding on residential property values in England[108]. The objectives of their research were to determine the performance of flood affected properties in comparison to similar nearby residential properties that are not flood liable, to establish if there is an increasing reluctance for insurance companies to insure residential property in flood liable areas, and to determine if flood liable residential property provides an additional security risk to financial institutions in the home lending market[108].

Quoting the Environmental Agency, a study stated that over 10% of the population of England and Wales is directly at risk from flooding, with a greater percentage of the population being indirectly affected by flooding due to road closures, service disruption and the loss of goods and produce[109]. This was equated to 1.85 million residential properties in England being at risk of flooding, with an additional 185,000 commercial properties also being situated in flood prone areas. Based on these residential and commercial property numbers, Environmental Agency in Britain stated that there were up to five million people in England and Wales who were directly at risk from flood event and that as at 2011 the value of residential and commercial properties subject to flooding was over £200 billion, with a further £14 billion of rural land subject to flooding[110]. The study was based on the survey of chartered surveyors in all counties of England that had been identified as flood liable and subject to coastal tidal flooding. These counties were identified from the Environment Agency flood maps. The result of the survey showed that out of the 23 counties surveyed, 12 counties rarely experienced any residential property flooding, with a further 4 counties experiencing frequent flooding and seven counties being subject to regular flooding. Their findings also revealed that the decline in residential property values is linked to the availability of both residential property insurance and finance. In areas where insurance is difficult to obtain, the impact on residential values is more significant[111].

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It was concluded in research that there is a direct significant correlation between the severity of a flood and a reduction in residential property values[112]. A severe flood provides a very visual short-term impact on the property buyer, seller, chartered surveyor, insurer and financier. While their previous research indicated that this perception of flooding reduces in relation to purchasers and sellers but is still a significant factor for the other parties involved in residential property. They also researched on the long-term impact of flood effect on residential property prices in Australia. The research was conducted to determine the performance of flood affected properties in comparison to similar nearby residential properties that are not flood liable and to establish if the difference in values between flood liable residential properties and flood free residential properties is constant, or decreases as the time period from the last known flood increases. In his research he quoted a study stating that the property that is subject to over floor flooding can result in the overcapitalization of the property due to the requirement to restore the property after flooding has occurred and that not rectifying the damage from flooding may minimize the problem of overcapitalization but would result in the loss of property value due to the neglected state of the building and overall structural depreciation[113]. Also, another study stated that flood prone properties are not considered as attractive as other residential properties and this results in a lower price or value and that on this basis the greatest impact on value or price would be immediately after a severe over floor flood where both disruption and property damage occur[114]. An analysis, showed a definite price differential between similar types of properties that are flood free compared to the same type of properties that are flood liable. The study also showed that following a period of both decreasing property prices and only small annual increases in property prices, the price difference between flood liable and flood free land will decrease, provided there are no further incidences of over floor flooding[115].

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A study assessed the impact of flooding on infrastructures and property value exploring the impacts in Lagos state through secondary sources using both purposive and stratified random sampling method, choosing only six (6) major areas in Badagry Local where 94 copies of questionnaire where administered[116]. The findings of the study indicated that the impact of flooding on property value in the study area is severe, which results to difficulty in selling the properties but the study had limited empirical evidences.

Using random sampling technique in the selection of the sampled properties a study collected data through the use of questionnaire as the paper investigated the effect of flooding on property value in Isheri North of Lagos mega city, Nigeria[117]. The study shows that flood is mainly caused by damp spills, heavy rainfall, improper wastage disposal and poor drainage system as suggested by the respondents, as it also revealed that properties in non-flooded areas of Isheri community attract higher rental values than those in the flooded area of Isheri North. The Hazus Flood theory was utilized but the study focused mainly on Isheri North in Lagos state.

In an investigative study carried out in Sydney, the amount of MSW collected and dumped at six disposal sites from 2007 to 2013 compared to anticipated population, per capita waste generation, and to gather information, a structured questionnaire with 1,245 copies was distributed[118]. Maps were created showing the locations in the city where MSW blocked drainage channels. Using multiple regression, it was possible to determine a connection between floods and MSW. In the Lagos metropolitan from 2007 to 2013, more municipal solid garbage was produced than was collected, according to the study. The study indicated that more solid trash was discovered in unauthorized locations than in recognized areas, indicating that the rate and frequency of municipal solid waste collection in the Lagos metropolis were unable to keep up with the rate of generation although the study is limited to the years 2007-2013 and it was not related to property damage and value[117,118].

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In Ogun state Nigeria, a study presented an outline of how climate change, in especially the rise in urban flooding, has impacted Nigerian cities[119]. The study established the causes and also suggested recommendations and approaches in curbing the effect of flood to the Nigerian cities. The Spatial Durbin theory was utilized and the study was qualitative in nature.

Another study which sought to determine the causes and impact of flooding in the study area using tools of interviews, focus group discussions and questionnaire and chi square which was used to establish the relationship[120]. The findings revealed that there exists a relationship between several areas and flood events.

In a review of flood events and its management in Nigeria using a historic approach[121]. The study developed an understanding of how Ajegunle residents were affected by the flood events and revealed the poorly managed health reforms. The Fuzzy set theory was used but the study focused mainly on the health implications of flood events and not the effect to property value damage.

An investigation was done on the effect of flood duration on residential property value in Peninsular Malaysia using a hedonic pricing model[122]. The findings of the study suggested that the selling price of residential property is significantly decreased by 0.015 percent due to flood. The Hedonic Pricing theory was employed but there was little empirical evidence that focused on the effect of flood on residential property value in Malaysia.

The urban area of Hangzhou was investigated on the effect of flood risk based upon data from 424 residential land plots using spatial autocorrelation analysis and the Spatial Durbin Model (SDM) approach[123]. The results indicated that the effect of flooding on the residential land prices in Hangzhou is as a result of Government regulations and market allocations and this makes it suffer a price discount of 8.62%. The Spatial Durbin Model was used and regarding the indicators of flood risk, it employs a dummy variable to calculate the flood

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hazard risk in the area, which is an abstraction of the actual situation. The opinions of developers or locals regarding the impact of flood risk on land prices was also not taken into account.

Aiming at investigating the impact of flooding on residential property value, a study using Shogunro Residential Estate, Agege, Lagos State as the case study as data was collected through questionnaire instrument administered on both the residents of the estate and registered Estate Surveying and Valuation firms[124]. According to study findings, illegal structures built across drainage canals in the area are the main reason for floods in the estate. The study also showed that the estate's property values are not significantly affected by flooding. Hedonic pricing theory was employed though the study was limited to Shogunro Estate, Agege.

Investigated the impacts of the flood event in July 2011 on women lives and health, another study used mixed method of questionnaire, interviews and focus groups[125]. The results indicated that women who were of the lower class in the society suffered more severely during the flood event and also experienced greater difficulty with recovery due to limited economic resources and social support. The Social Vulnerability theory was employed as the paper focused mainly on a variable Gender.

A previous study revealed that poorly maintained drainage systems, uncontrolled urban growth and solid waste management practices contribute to the flood risk events[126]. The study was built on the Hazus flood theory and was qualitative in nature.

In a recent study, two multi criteria analysis approach were applied: AHP &FAHP with the aid of GIS to assess areas prone to flood in Ibadan, Nigeria[127]. The findings indicated that 50% of Ibadan has low or moderate vulnerability to flooding and 15% of Ibadan is highly prone to flood and this is concentrated to the urban areas.

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Using semi-parametric estimate to analyze the regional and temporal variation impacts of the 2011 Brisbane flood on real estate markets in order to investigate the linearity of the relationship[128]. The findings indicate that most environmental factors have nonlinear effects on property prices, notably distance to rivers, demonstrating that the benefits of being near rivers outweigh the risks of flooding although the study was limited to the 2011 Brisbane flood on real estate markets.

A study examined the impact of flooding on residential property values in dolphin estate in Lagos using a survey research method[129]. The study revealed flooding to have a negative effect on the values of properties within the estate as it resulted to a decline in rental values of properties as the study was built upon the Hedonic pricing model.

The effect flooding has on residential property values in Lekki area was studied using survey research method. The results revealed that there is a statistically difference in the rental values of properties from both the flooded and non-flooded areas in Lekki phase 1. Lagos.

Examining the effect of flood events in Residential property values in England using the survey research method[130]. The result indicated that not only does flooding cause physical damage to real properties and disruption to trade, but also has a significant impact on affected population such health effect resulting into various diseases.

The remote sensing and GIS techniques was used to examine the impact of flooding along Ala River in Akure, Ondo State[131]. The study revealed that the flood events resulted from climate, rapid urbanization and not heeding to building regulations which rendered most properties that are along the flood plain to be extremely risky.

Also, using Spatial analysis to examine the efficiency of flood management practices in flood prone areas in Niger Delta, Nigeria, it was discovered that canalization and proper drainage

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system are proper ways to control and mitigate flood disasters[132]. The study focused solely on the control of flood events and not on the effects it has on the communities.

Another recent study identified the causes, their scope, and their effects. Data collection on the physical environment using topographical maps[133]. The drainage canals and floods were measured in terms of their physical dimensions. 2,000 city residents were chosen at random and required to provide answers to a few questions. The study reveals that flood is made worse by poor physical environment planning, rubbish placed in drainage channels and erosion passageways, and intentional or unintentional physical structures that obstruct the free flow of water along the drains.

In a cross-examination, a study zoomed on the risk of urban flooding through the use of vulnerability and exposure tests[134]. The results showed that regions with a high risk of flooding are mostly contained to the core business districts where the majority of urban activities are concentrated. The study was built upon the Fuzzy set theory but there was limited empirical evidence available in the study.

2.4 Conceptual Model

This study examines the impact of Ibadan urban flood management project interventions on property values using moderating independent variables of Urban Flood Management Strategies and dependent variables of Property Values with a conceptual relationship as depicted in the Figure below.

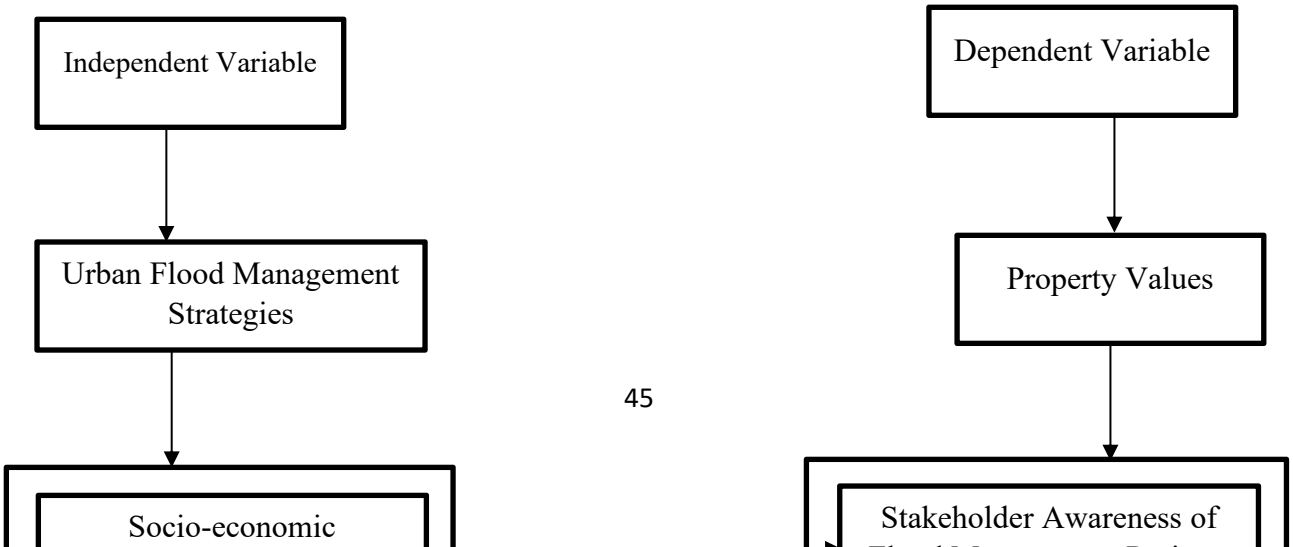

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Fig. 2.1 Conceptual Model

Source: Researcher's Conceptual Model, 2024

2.5 Summary of Gaps in Literature Reviewed

In a study on the impact of flooding on residential property value in Badagry area of Lagos State, Nigeria. The objective of the study was to assess the impact of flooding on infrastructures and property value exploring the impacts in Lagos state through secondary sources. Both purposive and stratified random sampling method was adopted choosing only six (6) major areas in Badagry Local, where 94 copies of questionnaire where administered. The findings of the study indicated that the impact of flooding on property value in the study area is severe, which results to difficulty in selling the properties. The study had limited empirical evidences on flood management and the intervention projects, with its impact on property values[91].

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In a study on effect of flooding on property value: A case study of Isheri North, Isheri, Lagos State, random sampling technique was adopted in the selection of the sampled properties as data was collected through the use of questionnaire as the paper investigated the effect of flooding on property value in Isheri North of Lagos mega city, Nigeria. The study shows that flood is mainly caused by damp spills, heavy rainfall, improper wastage disposal and poor drainage system as suggested by the respondents, as it also revealed that properties in non-flooded areas of Isheri community attract higher rental values than those in the flooded area of Isheri North. The study focused mainly on Isheri North in Lagos state, and effect of flooding on property value but no impact of flood management projects on property values[18].

In another study on municipal solid waste and flooding in Lagos metropolis, Nigeria: deconstructing the evil nexus. The amount of MSW collected and dumped at six disposal sites from 2007 to 2013 was compared to anticipated population, per capita waste generation, and to gather information, a structured questionnaire with 1,245 copies was distributed. Maps were created showing the locations in the city where MSW blocked drainage channels. Using multiple regression, it was possible to determine a connection between floods and MSW. In the Lagos metropolitan from 2007 to 2013, more municipal solid garbage was produced than was collected, according to the study. The study indicated that more solid trash was discovered in unauthorized locations than in recognized areas, indicating that the rate and frequency of municipal solid waste collection in the Lagos metropolis were unable to keep up with the rate of generation. The study is limited to the years 2007-2013 and it was not related to property value[8].

In a study on floods of fury in Nigerian Cities. The study presents an outline of how climate change, in especially the rise in urban flooding, has impacted Nigerian cities. The study established the causes and also suggested recommendations and approaches in curbing the

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effect of flood to the Nigerian cities. The study was qualitative in nature. It did not relate to property value nor flood management projects[37].

In a study to determine the causes and impact of flooding in the study area using tools of interviews, focus group discussions and questionnaires and chi square was used to establish the relationship. The findings revealed that there exists a relationship between several areas and flood events. The study was limited to determining the causes and impact of flooding in the study area[43].

A study reviewed flood events and its management in Nigeria using a historic approach. The study developed an understanding of how Ajegunle residents were affected by the flood events and revealed the poorly managed health reforms. The study focused mainly on the health implications of flood events and not the effect to property value[85].

In a study on the effect of flood risk based upon, data was collected from 424 residential land plots using spatial autocorrelation analysis and the Spatial Durbin Model (SDM) approach. The results indicate that the effect of flooding on the residential land prices in Hangzhou is as a result of Government regulations and market allocations and this makes it suffer a price discount of 8.62%. Regarding the indicators of flood risk, it employs a dummy variable to calculate the flood hazard risk in the area, which is an abstraction of the actual situation. The opinions of developers or locals regarding the impact of flood risk on property prices was not taken into account[73].

In a study aimed at investigating the impact of flooding on residential property value using Shogunro Residential Estate, Agege, Lagos State as the case study. Data was collected through questionnaire instrument administered on both the residents of the estate and registered Estate Surveying and Valuation firms. According to study findings, illegal structures built across drainage canals in the area are the main reason for floods in the estate.

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The study also showed that the estate's property values are not significantly affected by flooding. The study was limited to Shogunro Residential Estate, Agege. It does not take into account impact of flood management intervention projects on property values[25].

In a study on urban flood risks, impacts and management in Nigeria. The study reviewed literatures and other evidences to determine the impacts and management of Urban flood risks in Nigeria. The study revealed that poorly maintained drainage systems, uncontrolled urban growth and solid waste management practices contribute to the flood risk events. The study was qualitative in nature[12].

In a study on flood prone area mapping using GIS-based analytical hierarchy frameworks for Ibadan city, Nigeria. The study applied two multi criteria analysis approach: AHP &FAHP with the aid of GIS to assess areas prone to flood in Ibadan, Nigeria. The findings indicated that 50% of Ibadan has low or moderate vulnerability to flooding and 15% of Ibadan is highly prone to flood and this is concentrated to the Urban areas. There was limited empirical evidences used in the study[5].

In a study on the impact of flood dynamics on property values. This study uses semi-parametric estimate to analyze the regional and temporal variation impacts of the 2011 Brisbane flood on real estate markets in order to investigate the linearity of the relationship. The findings indicate that most environmental factors have nonlinear effects on property prices, notably distance to rivers, demonstrating that the benefits of being near rivers outweigh the risks of flooding[17]. The study was limited to the 2011 Brisbane flood on real estate markets[56].

A study examined the impact of flooding on residential property values in Dolphin Estate in Lagos using a survey research method. The study revealed flooding to have a negative effect

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on the values of properties within the estate as it resulted to the decline in rental values of properties. The study was focused on the real estate investors[21].

In a study on the effect flooding has on residential property values in the area using survey research method. The results revealed that there is a statistically significant difference in the rental values of properties from both the flooded and non-flooded areas in Lekki phase 1. Lagos. The study is limited to 2012 and effect of flooding on property values[77].

In another study on the effect of flood events in residential property values in England using the survey research method. The result indicated that not only does flooding cause physical damage to real properties and disruption to trade, but also has a significant impact on affected population such health effect resulting into various diseases. The study is limited to 2002 and impact of flooding on residential property values[5].

In a study on the challenges of poor drainage systems and floods in Lagos Metropolis, Nigeria. The study aimed to identify the causes, their scope, and their effects. Data collection on the physical environment using topographical maps. The drainage canals and floods were measured in terms of their physical dimensions. 2,000 city residents were chosen at random and required to provide answers to a few questions. The study reveals that flood is made worse by poor physical environment planning, rubbish placed in drainage channels and erosion passageways, and intentional or unintentional physical structures that obstruct the free flow of water along the drains. The study was solely based on Lagos Metropolis and the challenges of poor drainage.

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Endnotes

1. O., Adekola, J., Lamond, I., Adelekan, & E.B., Eze. *Evaluating flood adaptation governance in the city of Calabar, Nigeria.* **Climate and Development,** 12(9), 2020, pp.840-853.

2. A.J., Echendu. *Relationship between urban planning and flooding in Port Harcourt city, Nigeria; insights from planning professionals.* **Journal of Flood Risk Management,** 14(2), 2021, p.e12693.

3. O.I., Lawanson, D., Proverbs, & R.L., Ibrahim. *The impact of flooding on poor communities in Lagos State, Nigeria: The case of the Makoko urban settlement.* **Journal of Flood Risk Management,** 16(1), 2023, p.e12838.

4. A., Echendu, & N., Georgeou. '*Not going to plan': Urban planning, flooding, and sustainability in Port Harcourt city, Nigeria.* In Urban Forum. Dordrecht: Springer Netherlands. Vol. 32, No. 3, 2021, pp. 311-332.

5. S.A., Mashi, A.I., Inkani, O., Obaro, & A.S., Asanarimam. *Community perception, response and adaptation strategies towards flood risk in a traditional African city.* Natural Hazards, 103, 2020, pp.1727-1759.

6. G.T., Cirella, F.O., Iyalomhe, & P.O., Adekola. *Determinants of flooding and strategies for mitigation: Two-year case study of Benin city.* **Geosciences,** 9(3), 2019, p.136.

7. P.B., Cobbinah, C., Amoako, & A.S., Yeboah. *Informality and the politics of urban flood management.* **Environment and Planning C: Politics and Space,** 41(4), 2023, pp.826-843.

8. A.W., Butu, C.N., Emeribe, & E.T., Ogbomida. *Effects of seasonal flooding in Benin city and the need for a community-based adaptation model in disaster management in Nigeria*. **Nigerian Journal of Environmental Sciences and Technology (NIJEST)** Vol, 3(1), 2019, pp.112-128.

9. O.F., Kasim, B., Wahab, & M.F., Oweniwe. *Urban expansion and enhanced flood risk in Africa: The example of Lagos.* **Environmental Hazards,** 21(2), 2022, pp.137-158.

10. M., Poku-Boansi, C., Amoako, J.K., Owusu-Ansah, & P.B., Cobbinah. *What the state does but fails: Exploring smart options for urban flood risk management in informal Accra, Ghana.* **City and Environment Interactions,** 5, 2020, p.100038.

11. O.H., Okunola, & P.O., Olawuni. *Determinants of household flood resilience strategies in Kaduna Metropolis, Nigeria.* **Urban Climate,** 44, 2022, p.101216.

12. R.I., Ogie, C., Adam, & P., Perez. *A review of structural approach to flood management in coastal megacities of developing nations: Current research and future directions.* **Journal of Environmental Planning and Management,** 63(2), 2020, pp.127-147.

13. A.O., Abiri. *Assessment of flood risks in Ifo local government area of Ogun State.* **African Journal of Land Policy and Geospatial Sciences,** 4(4), 2021, pp.594-605.

Lead City University Ibadan DO NOT COPY

14. C.B., Okoye, & V.N., Ojeh. *Mapping of flood prone areas in Surulere, Lagos, Nigeria: A GIS approach.* **Journal of Geographic Information System,** 7(2), 2015, pp.158-176.

15. F.N., Buba, O.C., Ojinnaka, R.I., Ndukwu, G.I., Agbaje, & Z.O., Orofin. *Assessment of flood vulnerability in some communities in Lokoja, Kogi State, Nigeria, using participatory geographic information systems.* **International Journal of Disaster Risk Reduction,** 55, 2021, p.102111.

16. M.A., Oni, & S., Ayegba. *Environmental policies, agencies and flood management in selected states in Nigeria (2005-2021): The gaps and the challenges.* **KIU Journal of Humanities,** 7(2), 2022, pp.51-62.

17. A., Ebekozien, C., Aigbavboa, M.S., Samsurijan, R.B., Radin Firdaus, & A., Salman. *Appraising flood resilience technologies role in developing cities: How prepared is the professional stakeholder?.* **International Journal of Construction Management,** 24(7), 2024, pp.683-692.

18. D.A., Dawson, K., Vercruysse, & N., Wright. *A spatial framework to explore needs and opportunities for interoperable urban flood management.* **Philosophical Transactions of the Royal Society A,** 378(2168), 2020, p.20190205.

19. A.J., Echendu. *Human factors vs climate change; experts' view of drivers of flooding in Nigeria.* **Natural Hazards Research,** 3(2), 2023, pp.240-246.

20. S.S., Danhassan, A., Abubakar, A.S., Zangina, M.H., Ahmad, S.A., Hazaea, M.Y., Ishak, & J., Zhang. *Flood policy and governance: A pathway for policy coherence in Nigeria.* **Sustainability,** 15(3), 2023, p.2392.

21. A.O., Yoade, V.A., Onifade, & T.P., Olajide. *An assessment of public perception of flooding in Akure, Nigeria.* **International Journal of Development and Sustainability ISSN**, 2019, pp.2186-8662.

22. A.J., Echendu. *Flooding, food security and the sustainable development goals in Nigeria: An assemblage and systems thinking approach.* **Social Sciences,** 11(2), 2022, p.59.

23. E., Yiwo, D., Jato-Espino, P., Carracedo, & M.M., de Brito. *Multi-stakeholder perception on flood management in Ghana: Analysis of drivers and potential solutions, with a focus on surface permeability.* **International Journal of Disaster Risk Reduction,** 76, 2022, p.102990.

24. V., Oladokun, D., Proverbs, O., Adebimpe, & T., Adedeji. *Handbook of flood risk management in developing countries.* In Handbook of Flood Risk Management in Developing Countries, Routledge 2023, pp. 1-5.

25. D.A., Week, C.H., Wizor, & O.S., Eludoyin. *Assessment of community's resilience to flooding in the flood-prone areas of the core Niger Delta, Nigeria.* **J. Geogr. Environ. Earth Sci. Int.,** 23(4), 2019, pp.1-13.

26. N.D., Danjibo, A.E., Adeoye, & O.S., Ojo. *Dynamics in the response mechanisms of major stakeholders during flood disaster: A case study of Kogi state, Nigeria.* **African Journal of Social Sciences and Humanities Research,** 2(2), 2019, pp.29-42.

Lead City University Ibadan DO NOT COPY

27. A.M.O.S., Danladi. *Indigenous knowledge in flood disaster risk reduction in Kaduna town Nigeria* (Doctoral dissertation, PhD dissertation submitted to Universiti Teknologi Malaysia), 2019.

28. A., Faisal Koko, W., Yue, A.G., Abdullahi, R., Hamed, & A.A., Noman Alabsi. *Analyzing urban growth and land cover change scenario in Lagos, Nigeria using multi-temporal remote sensing data and GIS to mitigate flooding.* **Geomatics, Natural Hazards and Risk,** 12(1), 2021, pp.631-652.

29. A.A., Adaji, J., Richard, S., Mohamed, & I.Y., Ebenehi. *The aftermath of 2012 flooding in Ibaji and Lokoja local government areas of Kogi State-Nigeria.* **Disasters,** 3(1), 2019, pp.6-13.

30. G.C., Gerald-Ugwu, C.C., Egolum, & F.I., Emoh. *Investigating the adoption of property-level flood protection (PLFP) by homeowners in OBIO/AKPOR Port-Harcourt.* **International Journal of Thesis Projects and Dissertations,** 7(3), 2019, pp.48-57.

31. T., Adedeji, D., Proverbs, H., Xiao, P., Cobbing, & V., Oladokun. *Making Birmingham a flood resilient city: Challenges and opportunities.* **Water,** 11(8), 2019, p.1699.

32. S., IgudaLadan, & J.Y., Saulawa. *Flood disaster response and recovery in Nigeria: a case study of 2018 Jibia flood disaster, Katsina State.* **Journal of Environmental Science, Toxicology and Food Technology,** 15(4), 2021, pp.08-18.

33. E., Gaisie, & P.B., Cobbinah. *Planning for context-based climate adaptation: Flood management inquiry in Accra.* **Environmental Science & Policy,** 141, 2023, pp.97-108.

34. H.I., Abdullahi, & O.A., Oyinlola. *Flood disaster and national security: A criminologists exploration of Lagos metropolis, Nigeria.* **African Social Science and Humanities Journal,** 1(1), 2020, pp.71-81.

35. M., Tiepolo, & A., Galligari. *Urban expansion-flood damage nexus: Evidence from the Dosso Region, Niger.* **Land Use Policy,** 108, 2021, p.105547.

36. M.O., Jimoh, S.O., Bilewu, A., Saheed, & H.S., Aremu. *Multidimensional approach to mitigating flood risks and impact: A case study of rice farming in Nigeria*, 2023.

37. T., Doeffinger, & S., Rubinyi. *Secondary benefits of urban flood protection.* **Journal of Environmental Management,** 326, 2023, p.116617.

38. C.H., Nwokoye, O., Ositanwosu, & I., Umeh. *Development of an advanced knowledge domain for coordinated flood inundation management in developing Nations*. **Egyptian Computer Science Journal,** 44(3), 2020.

39. C., Amoako, P.B., Cobbinah, & R.M., Darkwah. *Complex twist of fate: The geopolitics of flood management regimes in Accra, Ghana.* Cities, 89, 2019, pp.209-217.

40. N.J., Peter, H.I., Okagbue, E.C., Obasi, & A.O., Akinola. *Review on the application of artificial neural networks in real estate valuation.* **International Journal,** 9(3), 2020, pp.5-11.

Lead City University Ibadan DO NOT COPY

41. A.A., Ayorinde, A., Adefioye, O., Oladipo, & O.O., Fabiyi. *Flood risk management projects: Financing and project implementation, the case of Ibadan urban flood management project.* In Handbook of Flood Risk Management in Developing Countries, Routledge, 2023, pp. 217-228.

42. A.J., Echendu. *Urban planning, sustainable development and flooding: a case study of Port Harcourt city,* Nigeria, 2019.

43. A.J., Echendu. *Flooding in Nigeria and Ghana: Opportunities for partnerships in disaster-risk reduction.* **Sustainability: Science, Practice and Policy,** 18(1), 2023, pp.1-15.

44. C.H., Wizor, & R.A., Akpamgbo. *Assessment of the impact of urban floods on real property development in the Port Harcourt metropolis, Nigeria.* **Asian Journal of Geological Research,** 2(3), 2019, pp.179-194.

45. O.M., Ogundele, & R.E., Ubaekwe. *Early warning system and ecosystem-based adaptation to prevent flooding in Ibadan Metropolis, Nigeria.* Handbook of climate change resilience. Springer, Cham, 2019.

46. F.N., Nkeki, E.I., Bello, & I.G., Agbaje. *Flood risk mapping and urban infrastructural susceptibility assessment using a GIS and analytic hierarchical raster fusion approach in the Ona River Basin, Nigeria.* **International Journal of Disaster Risk Reduction,** 77, 2022, p.103097.

47. D.K., Nsiegbe, V.E., Weli, G.O., Chukwu-Okeah, O.S., Eludovin, T.P., Abali, I.T.I., Michael, & L.B., Nkii. *A GIS-based flood risk assessment in the urban catchment of Uyo metropolis, Nigeria.* **International Journal of Information Systems and Informatics,** 2(4), 2021.

48. O.S., Olokeogun, A., Ayanlade, & O.O., Popoola. *Assessment of riparian zone dynamics and its flood-related implications in Eleyele area of Ibadan, Nigeria.* **Environmental Systems Research,** 9(1), 2020, p.6.

49. S.I., Ladan. *A study of flood disaster incidence in Jibia, Katsina State, Nigeria.* **Nigerian Geographical Journal,** 16(1), 2022.

50. U., Ibeabuchi. *Mapping seasonal flood inundation and developing an early warning system for Lagos metropolis (Nigeria): A study between 1990 and 2011.* **Water and Environmental Sustainability,** 3(2), 2023, pp.48-67.

51. A., Shuaibu. *Flood reduction through flood risk and vulnerability assessment and mapping in Hadejia River Basin, Nigeria* (Master's thesis, PAUWES), 2020.

52. J., Lamond, O., Adekola, I., Adelekan, B., Eze, & F., Ujoh. *Information for adaptation and response to flooding, multi-stakeholder perspectives in Nigeria.* **Climate,** 7(4), 2019, p.46.

53. N.G., Alli, J., Aina, & K., Ganiyu. *Awareness and acceptance of household (building) insurance among private residence of flood prone areas in Lagos State, Nigeria.* **Caritas Journal of Management,, Social Sciences and Humanities,** 2(1), 2023.

Lead City University Ibadan DO NOT COPY

54. C.O., Iroham, H.I., Okagbue, I.F., Ekanem, N.J., Peter, O.W., Samuel, S.E., Nto, S., Isiaka, & Adedotun. *Three attributes determining land values in three selected housing estates in Uyo, Nigeria.* **Frontiers in Sustainable Cities,** 6, 2024, p.1384945.

55. A.K., Oyetunji, C.V., Amaechi, E.C., Dike, A.B., Ayoola, & M.A., Olukolajo. *Factors influencing stakeholders' decision to invest in residential properties: A perceptual analysis of flood-risk areas.* **Buildings**, 13(6), 2023, p.1560.

56. T., Aiyewunmi. *Challenges and potential solutions to pluvial flood risk in urban tropical African communities, a case study using Ijebu-Ode, in South West Nigeria (Doctoral dissertation, University of Liverpool),* 2023.

57. T.S., Onajomo. *Geospatial assessment of land use/cover, rainfall, and flood incidents in Eti–Osa, Lagos, Nigeria*. **South African Journal of Geomatics,** 11(2), 2022, pp.202-217.

58. O.Q., Muhammed, & A.O., Eludoyin. *A multi-criteria evaluation of urban flood vulnerability and perception in Osun River Basin, Southwest Nigeria.* **In Geoinformatics for Sustainable Urban Development** CRC Press, 2023, pp. 117-143.

59. M.A., Enoh, R.E., Njoku, & U.C., Okeke. *Modeling and mapping the spatial–temporal changes in land use and land cover in Lagos: A dynamics for building a sustainable urban city.* **Advances in Space Research,** 72(3), 2023, pp.694-710.

60. S.O., Toka. *Change in land cover, rainfall and flood incidence in Eti–Osa, Lagos, Nigeria.* **South African Journal of Geomatics,** 11(2), 2022.

61. A.P., Badamosi, A.I., Olutumise, O.P., Olukoya, A., Adegoroye, & O.A., Aturamu. *Socioeconomic impacts of flooding and its coping strategies in Nigeria: Evidence from Dagiri community, Gwagwalada area council of Abuja.* **Natural Hazards Research,** 2023.

62. O.F., Kasim, B., Wahab, & M.F., Oweniwe. *Urban expansion and enhanced flood risk in Africa: The example of Lagos.* **Environmental Hazards,** 21(2), 2022, pp.137-158.

63. M.O., Jelili, A.A., Ajibade, & A.T., Alabi. *Informal urban migrant settlements in Nigeria: environmental and socioeconomic dynamics of Sabo, Ibadan.* **GeoJournal,** 88(2), 2023, pp.2045-2062.

64. Y.B., Liman, S., Akilu, & R.K., Idris. *An assessment of the extent and impact of annual flooding in Kano Metropolis, Kano State-Nigeria.* **African Journal of Environmental Sciences and Renewable Energy,** 8(1), 2022, pp.25-42.

65. O.A., Fashae, M.N., Tijani, A.E., Adekoya, S.A., Tijani, E.G., Adagbasa, & J.A., Aladejana. *Comparative assessment of the changing pattern of land cover along the Southwestern coast of Nigeria using GIS and remote sensing techniques.* **Scientific African,** 17, 2022, p.e01286.

66. A., Ola. *Climate change effects and livelihood-adaptation strategies by the urban poor in Ibadan, Nigeria.* **Town and Regional Planning,** 81, 2022, pp.24-38.

Lead City University Ibadan DO NOT COPY

67. U., Ibeabuchi. *Mapping seasonal flood inundation and developing an early warning system for Lagos Metropolis (Nigeria): A study between 1990 and 2011.* **Water and Environmental Sustainability,** 3(2), 2023, pp.48-67.

68. B.N., Ekwueme. *Machine learning based prediction of urban flood susceptibility from selected rivers in a tropical catchment area.* **Civil Engineering Journal,** 8(9), 2022, p.1857.

69. T.E., Ologunorisa, O., Obioma, & A.O., Eludoyin. *Urban flood event and associated damage in the Benue valley, Nigeria.* **Natural Hazards,** 111(1), 2022, pp.261-282.

70. F.M., Doho, J.A., Falola, & S., Yunus. *Vulnerability dynamics and urban flood hazardscape pattern: A geospatial analysis in Gombe city, Nigeria.* **Geosfera Indonesia,** 7(2), 2022, pp.194-206.

71. S.Y., Danso, Y., Ma, A., Osman, & I.Y., Addo. *Integrating multi-criteria analysis and geospatial applications for mapping flood hazards in Sekondi-Takoradi Metropolis, Ghana.* **Journal of African Earth Sciences,** 209, 2024, p.105102.

72. E.S., Okonofua, & N., Kayode-Ojo. *Urban flooding vulnerability analysis using weighted linear method with geospatial information system.* **African Scientific Reports,** 2023, pp.104-104.

73. K.J., Samuel, B., Ayeni, O.H., Adebayo, & E.G., Adagbasa. *A geospatial analysis of flood risks and vulnerability in Ogun-Osun river basin, Nigeria.* In Landscape Ecology and Water Management: Proceedings of IGU Rohtak Conference, Springer Japan. Vol. 2, 2014, pp. 307-320.

74. A.A., Komolafe, B.S., Awe, I.E., Olorunfemi, & P.G., Oguntunde. *Modelling flood-prone area and vulnerability using integration of multi-criteria analysis and HAND model in the Ogun River Basin, Nigeria.* **Hydrological Sciences Journal,** 65(10), 2020, pp.1766-1783.

75. D.K., Nsiegbe, V.E., Weli, G.O., Chukwu-Okeah, O.S., Eludoyin, T.P., Abali, I.M., Inko-Tariah, & L.B., Nkii. *An assessment of Flood vulnerability in selected urban catchment: A case study of port Harcourt metropolis, Nigeria.* **World Bulletin of Social Sciences,** 5, 2021, pp.1-22.

76. A.A., Popoola, B.M., Adeleye, K.N., Adeniji, T.O., Babalola, & H.H., Magidimisha-Chipungu. *Indicators for disaster vulnerability to the overflowing of the Niger river in adjoining settlements in the confluence city of Lokoja, Nigeria,* 2022.

77. I.O., Adelekan. Urban dynamics, everyday hazards and disaster risks in Ibadan, Nigeria. **Environment and Urbanization,** 32(1), 2020, pp.213-232.

78. P.N., Bright, & W., Silverline. *Mitigation and response measures to flood disaster in khana local government area of Rivers state, Nigeria.* **Academicia: An International Multidisciplinary Research Journal,** 12(4), 2022, pp.514-529.

79. H., Garba, & L., Abdulraheem. *Modelling and estimation of the rainfall intensity and flood management in Efab-Estate, Abuja*. **Journal of Science and Technology Research,** 4(3), 2022.

Lead City University Ibadan DO NOT COPY

80. I.E., Mfon, M.C., Oguike, S.U., Eteng, & N.M., Etim. *Causes and effects of flooding in nigeria: A review.* **East Asian Journal of Multidisciplinary Research,** 1(9), 2022, pp.1777-1792.

81. I.S., Akoteyon. *Factors influencing the occurrence of flooding, risk and management strategies in Lagos, Nigeria.* **Sustainable Water Resources Management,** 8(3), 2022, p.68.

82. K., Abass. *Rising incidence of urban floods: Understanding the causes for flood risk reduction in Kumasi, Ghana.* **GeoJournal,** 87(2), 2022, pp.1367-1384.

83. A.F., Abimbola, H.S.A., Bakar, M.Z., Mat, & O.H., Adebambo. *Evaluating the influence of resident agencies' participation in flood management via social media, in Nigeria.* **Pertanika Journal of Social Science and Humanities,** 28(4), 2020, pp.2765-2785.

84. E., Louw, C.C., Olanrewaju, O.A., Olanrewaju, & M., Chitakira. *Impacts of flood disasters in Nigeria: A critical evaluation of health implications and management.* **Jàmbá: Journal of Disaster Risk Studies,** 11(1), 2019, pp.1-9.

85. T.O., Ogunbode, & V.O., Oyebamiji. *Towards a sustainable city environment: Resolving the challenge of flooding in a growing tropical city in Osun State, Nigeria-A review.* **Aswan University Journal of Environmental Studies,** 3(4), 2023, pp.346-356.

86. G.C., Gerald-Ugwu, C.C., Egolum, & F.I., Emoh. *An investigation of factors accelerating rise in building in the flood prone areas of Port Harcourt.* **Iconic Research and Engineering Journals,** 3(1), 2019, pp.375-384.

87. A.I., Ayede, O.O., Ashubu, K.R., Fowobaje, S., Aboubaker, Y.B., Nisar, S.A., Qazi, R., Bahl, & A.G., Falade. *Management of possible serious bacterial infection in young infants where referral is not possible in the context of existing health system structure in Ibadan, South-west Nigeria.* **PloS one,** 16(3), 2021, p.e0248720.

88. N.I., Bahago, E.E., Owoicho, M., Ariyo, H., Nakkudu, & S., Okon. *The role of community engagement in environmental rehabilitation: The Ibadan community experience, South-West Nigeria. South-West Nigeria (October 12, 2022)*, 2022.

89. A.A., Akanmu, U.O., Salisu, S.O., Fasina, & S.A., Okunubi. *An assessment of the local empowerment and environmental management programme (LEEMP) for poverty alleviation in Oyo State, Nigeria.* **Environmental & Socio-economic Studies,** 7(3), 2019, pp.38-53.

90. A.O., Busari. *Conflict in the workplace: Evaluating emotional intelligence as therapeutic approach in resolving the nurse-physician clashes in two secondary hospitals in Oyo state, Nigeria.* **World Scientific News,** (135), 2019, pp.129-143.

91. R.A., Akinseye. *Administration of primary health care programme in local government in Nigeria: A case study of Ibadan south west local government.* **International Journal of Science and Healthcare Research,** 5 (3), 2020, 337.

Ibadan City University Ibadan DO NOT COPY

92. P.A., Akande. *The effect of an educational intervention to improve tuberculosis infection control among nurses in Ibadan, south-west Nigeria: A quasi-experimental study.* **BMC nursing**, 19, 2020, pp.1-9.

93. F.M., OlaOlorun, & N.A., John. *A couple-based gender transformative intervention to enhance women's participation in household decision-making: results from a cluster randomised control trial in Ibadan, Nigeria.* **Development in Practice,** 31(8), 2021, pp.1070-1082.

94. O., Fadairo, O., Alabi-Adelakun, & A., Adetunji. *Promoting community-led water, sanitation and hygiene interventions in rural settlements in Oyo state, Nigeria: Lessons from Agele and Mogba communities of Ibarapa-East Local Government Area.* **Rural-Urban Link Sustain Dev,** 163, 2020, pp.176-201.

95. C.A.O., Akinbami. *Climatepreneurship: Adaptation strategy for climate change impacts on rural women entrepreneurship development in Nigeria.* In *African handbook of climate change adaptation*. Cham: Springer International Publishing. 2021, pp. 2143-2168.

96. O.K., Oyelade, & A.O., Omobowale. *'Warfare' pentecostalism, poverty and welfare provisioning in Southwestern Nigeria.* **International Journal of Critical Diversity Studies,** 2(2), 2019, pp.37-54.

97. I., Petersen, A., van Rensburg, F., Kigozi, M., Semrau, C., Hanlon, J., Abdulmalik, L., Kola, A., Fekadu, O., Gureje, D., Gurung, & M., Jordans. *Scaling up integrated primary mental health in six low-and middle-income countries: Obstacles, synergies and implications for systems reform.* BJPsych Open, 5(5), 2019, p.e69.

98. O.K., Bishoge, G.G., Kombe, & B.N., Mvile. *Community participation in the renewable energy sector in Tanzania: Community participation in the renewable energy sector.* **International Journal of Sustainable Energy Planning and Management,** 28, 2020, pp.121-134.

99. I.R., Aliu. *Social policy, public housing, and poverty alleviation in Nigeria.* In *the Routledge handbook of poverty in the global South*. Routledge India. 2023, pp. 48-73.

100. I.O., Ajayi, A.S., Jegede, A.O., Ogunwale, J., Ogundairo, O.S., Olaleye, F.O., Oshiname, & C.O., Falade. *Community acceptance, satisfaction, and support for case management of malaria of various degrees in selected rural communities in Ibadan, Oyo-State.* **Ghana Medical Journal,** 55(3), pp.198-205.

101. T.M., Adeyemi-Kayode, S., Misra, & R., Damaševičius. *Impact analysis of renewable energy based generation in West Africa–a case study of Nigeria.* **Problemy Ekorozwoju,** 16(1), 2021.

102. S.J., Akinsete, J.K., Akintunde, & O.O., Oduwole. *Soil contamination in an urban low-income community in Ibadan, Nigeria: Climate-driven changes.* In Handbook of Climate Change Management: Research, Leadership, Transformation. Cham: Springer International Publishing. 2021, pp. 1-22.

Lead City University Ibadan DO NOT COPY

103. J.O., Jiboku, & P.A., Jiboku. *Poverty and the democratization crisis in Nigeria: A failure of the social contract.* Equidad y Desarrollo (34), 2019.

104. S., Kaur. *Barriers to consumption of fruits and vegetables and strategies to overcome them in low-and middle-income countries: A narrative review.* **Nutrition Research Reviews,** 2022, pp.1-28.

105. E., Ghimire, & S., Sharma. *Flood damage assessment in HAZUS using various resolution of data and one-dimensional and two-dimensional HEC-RAS depth grids.* **Natural Hazards Review,** 22(1), 2021, p.04020054.

106. E., Ghimire. *Evaluation of one-dimensional and two-dimensional HEC-RAS models for flood travel time prediction and damage assessment using HAZUS-MH: A case study of Grand River, Ohio* (Doctoral dissertation), 2019.

107. N., Deng, X., Wang, & Y., Yang. *Indoor property flood damage assessment and insurance for residential buildings based on HAZUS--A case study of Mayangxi river basin.* In IOP Conference Series: Earth and Environmental Science. IOP Publishing, Vol. 643, No. 1, 2021, p. 012158.

108. A., Royal, & M., Walls. *Flood risk perceptions and insurance choice: Do decisions in the floodplain reflect overoptimism?.* **Risk Analysis,** 39(5), 2019, pp.1088-1104.

109. O., Parent, R.V., Hofe, S., Oh, P., Ervin, M.A., Khalid, & L., Yeghiazarian. *Estimating the socioeconomic impacts of flooding on regional economies with a computable general equilibrium model.* **Water Resources Research,** 59(9), 2023, p.e2022WR033474.

110. O.M., Nofal, J.W., van de Lindt, & T.Q., Do. *Multi-variate and single-variable flood fragility and loss approaches for buildings.* **Reliability Engineering & System Safety,** 202, 2020, p.106971.

111. C., Lawyer, H.T., Davani, & E., Goharian. *Coalitional game theory for stormwater management and Green infrastructure practices.* **Journal of Water Resources Planning and Management,** 150(1), 2024, p.04023070.

112. A., Malekloo, E., Ozer, & W., Ramadan. *Bridge network seismic risk assessment using ShakeMap/HAZUS with dynamic traffic modeling.* **Infrastructures,** 7(10), 2022, p.131.

113. C., Deng, J., Shang, & H., Wang. *Damage assessing and improving city resilience strategies of hurricanes based on Hazus model.* In 2nd International Conference on Applied Mathematics, Modelling, and Intelligent Computing (CAMMIC 2022), SPIE. Vol. 12259, 2022, pp. 652-659.

114. G., Marchesini, H., Beraud, & B., Barroca. *Quantification of disaster waste: Review of the available methods.* **International Journal of Disaster Risk Reduction,** 53, 2021, p.101996.

115. E., Martínez-Gomariz, E., Forero-Ortiz, M., Guerrero-Hidalga, S., Castán, & M., Gómez. *Flood depth–damage curves for Spanish urban areas.* **Sustainability,** 12(7), 2020, p.2666.

Lead City University Ibadan DO NOT COPY

116. T., Tanir, A.D.S., de Lima, G., de A. Coelho, S., Uzun, F., Cassalho, & C.M., Ferreira. *Assessing the spatiotemporal socioeconomic flood vulnerability of agricultural communities in the Potomac River Watershed.* **Natural Hazards,** 108(1), 2021, pp.225-251.

117. K.G., Hopkins, J.S., Welles, E.J., Pindilli, G.B., Noe, P.R., Claggett, L., Ahmed, & M.J., Metes. *Societal benefits of floodplains in the Chesapeake Bay and Delaware River watersheds: Sediment, nutrient, and flood regulation ecosystem services.* **Journal of Environmental Management,** 345, 2023, p.118747.

118. Z., Adeel, A.M., Alarcón, L., Bakkensen, E., Franco, G.M., Garfin, R.A., McPherson, K., Méndez, M.B., Roudaut, H., Saffari, & X., Wen. *Developing a comprehensive methodology for evaluating economic impacts of floods in Canada, Mexico and the United States.* **International Journal of Disaster Risk Reduction,** 50, 2020, p.101861.

119. T., Sarmah, & S., Das. *Determining urban flood vulnerability using an indicator based approach.* In Conference: 55th ISOCARP World Planning Congress, 2019.

120. Q., Sun, R., Nazari, M., Karimi, M.G., Rabbani Fahad, & R.W., Peters. *Comprehensive flood risk assessment for wastewater treatment plants under extreme storm events:* A case study for New York City, United States. Applied Sciences, 11(15), 2021, p.6694.

121. N., Pinter, & J.C., Rees. *Assessing managed flood retreat and community relocation in the Midwest USA.* **Natural Hazards,** 107, 2021, pp.497-518.

122. K., McEligot, P., Brouse, & A., Crooks. *Sea Bright, New Jersey reconstructed: Agent-based protection theory model responses to Hurricane Sandy.* In 2019 Winter Simulation Conference (WSC). IEEE, 2019, pp. 251-262.

123. M.K., Sen, S., Dutta, & G., Kabir. *Evaluation of interaction between housing infrastructure resilience factors against flood hazard based on rough DEMATEL approach.* **International Journal of Disaster Resilience in the Built Environment,** 12(5), 2021, pp.555-575.

124. M.G., Miguez, F.C.B., Mascarenhas, L.P., Canedo de Magalhães, & C.F.V., D'Alterio. *Planning and design of urban flood control measures: Assessing effects combination.* **Journal of Urban Planning and Development,** 135(3), 2019, pp.100-109.

125. L., Hoang, R.A., Fenner, & M., Skenderian. *A conceptual approach for evaluating the multiple benefits of urban flood management practices.* **Journal of Flood Risk Management,** 11, 2018, pp.S943-S959.

126. T., Doeffinger, & S., Rubinyi. *Secondary benefits of urban flood protection.* **Journal of Environmental Management,** 326, 2023, p.116617.

127. W., Mobley, K.O., Atoba, & W.E., Highfield. *Uncertainty in flood mitigation practices: Assessing the economic benefits of property acquisition and elevation in flood-prone communities.* **Sustainability,** 12(5), 2020, p.2098.

128. S., Zhang, C., Zevenbergen, P., Rabé, & Y., Jiang. *The influences of sponge city on property values in Wuhan, China.* **Water,** 10(6), 2018, p.766.

Lead City University Ibadan DO NOT COPY

129. K., Vercruysse, D.A., Dawson, V., Glenis, R., Bertsch, N., Wright, & C., Kilsby. *Developing spatial prioritization criteria for integrated urban flood management based on a source-to-impact flood analysis.* **Journal of Hydrology,** 578, 2019, p.124038.

130. P., Avner, V., Viguié, B.A., Jafino, & S., Hallegatte. *Flood protection and land value creation–not all resilience investments are created equal.* **Economics of Disasters and Climate Change,** 6(3), 2022, pp.417-449.

131. J.L., Webber, M.J., Gibson, A.S., Chen, D., Savic, G., Fu, & D., Butler. *Rapid assessment of surface-water flood-management options in urban catchments.* **Urban Water Journal,** 15(3), 2018, pp.210-217.

132. J.L., Webber, A.S., Chen, J., Stevens, R., Henderson, S., Djordjević, & B., Evans. *Targeting property flood resilience in flood risk management.* **Journal of Flood Risk Management,** 14(3), 2021, p.e12723.

133. J., Skrydstrup, R., Löwe, I.B., Gregersen, M., Koetse, J.C., Aerts, M., de Ruiter, & K., Arnbjerg-Nielsen. *Assessing the recreational value of small-scale nature-based solutions when planning urban flood adaptation.* **Journal of Environmental Management,** 320, 2022, p.115724.

134. M.J., Hammond, A.S., Chen, S., Djordjević, D., Butler, & O., Mark. *Urban flood impact assessment: A state-of-the-art review.* **Urban Water Journal,** 12(1), 2015, pp.14-29.

135. F., Pagliacci, E., Defrancesco, F., Bettella, & V., D'Agostino. *Mitigation of urban pluvial flooding: what drives residents' willingness to implement green or grey stormwater infrastructures on their property?.* **Water,** 12(11), 2020, p.3069.

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Chapter Three

Methodology

This chapter presents the Research Methodology that was used for this study. This chapter is organized under the following sub heading; Research design, study area, method of data collection, population of study, sampling size and sampling techniques, instrument of data collection, method of data analysis and theoretical consideration.

3.1 Research Design

This study employed the survey research design as it made use of selected sample size surveyed from the population of study, from which inference was made to the population after analysis. This also used cross-sectional survey research design of quantitative techniques, by generating primary data for the survey and also qualitative data. Here, the researcher used questionnaires which was distributed to the selected respondents and key informant interview was also used to collect one-time data from the field. The research design employed the triangulation of data collected to allow for broad information as well as a deeper understanding of the phenomenon under study.

The quantitative method involved deductive logic, where patterns in human lives were sought by transforming realities into empirical components called numerical variables which makes it possible to explore the rate, prevalence or associations through statistical modeling[1]. The quantitative approach is underpinned in positivism where a person and reality are separate and objective reality exists beyond the human mind. This method favored this study because the measure of validity-data truly measures reality; reliability-research results can be reproduced; research object has inherent qualities that exist independently of the researchers[2].

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3.2 Population of the Study

The general population considered for this research study were drawn from the 17 Priority Project Sites of the Ibadan Urban Flood Management Project. These areas are those that have experienced flood and where flood intervention projects have been carried out and completed. Areas without flood and where flood control intervention projects are yet to be completed were excluded from the study. Table 3.1 shows the list of the 17 Priority Project Sites of the Ibadan Urban Flood Management Flood Project.

Table 3.1: Ibadan Urban Flood Management Project - 17 Priority Project Intervention Sites

S/N	Location	Type of Crossing Structure	Hydraulic Structure	Local Government Areas
1	Saasa-Osajin	Culvert	2mx3m double-cell culvert	Ido
2	Ola Adua	Culvert	2mx3m Triple Cell Culvert	Ido
3	Cele Rainbow	Culvert	2mx3m Triple Cell Box Culvert	Oluyole
4	Ogbere Pegba	Bridge	90m^2 Bridge, 2x15m	Ona Ara
5	Ebenezeri RC	Bridge	1- Span @ 15m	Egbeda
6	Omiri RC	Culvert	3-Cells 3mx3.5m	Egbeda
7	Olorungunwa	Culvert	2Nos(3x3.5)+2Nos(2.5x2.5)	Egbeda
8	Oke Ayotuntun	Culvert	1-Cell 3mx3.5m	Egbeda
9	Alaro 7up RC	Bridge	1- Span @ 15m	South West
10	Believer RC	Bridge	5- Spans @ 15m	Oluyole
11	Elere	Culvert	1-Cell 3mx3.5m	Oluyole/Ona - Ara
12	Foworogi RC	Bridge	1- Span @ 15m	Oluyole/Ona - Ara
13	Ogbere Moradeyo RC	Bridge	1- Span @ 15m	Oluyole/Ona - Ara
14	Abonde Ogbere	Bridge	1- Span @ 15m	Ona Ara
15	Maje RC	Culvert	3-Cells 3mx3.5m	Soka Area, Oluyuole
16	Alaro Poly RC	Bridge	5- Spans @ 15m	Ido
17	Isokun Ojoo	Culvert	2 - Cells 3mx3.5m	Akinyele

Source: Ibadan Urban Flood Management Project, 2024

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Table 3.2: Ibadan Urban Flood Management Project - 17 Priority Project Intervention Sites with housing units

S/N	Location	Type of Crossing Structure	Hydraulic Structure	Local Government Areas	Housing Units within 500-meter radius
1	Saasa-Osajin	Culvert	2mx3m double-cell culvert	Ido	1187
2	Ola Adua	Culvert	2mx3m Triple Cell Culvert	Ido	838
3	Cele Rainbow	Culvert	2mx3m Triple Cell Box Culvert	Oluyole	1026
4	Ogbere Pegba	Bridge	90m^2 Bridge, 2x15m	Ona Ara	1099
5	Ebenezeri RC	Bridge	1- Span @ 15m	Egbeda	1454
6	Omiri RC	Culvert	3-Cells 3mx3.5m	Egbeda	981
7	Olorungunwa	Culvert	2Nos(3x3.5)+2Nos(2.5x2.5)	Egbeda	1094
8	Oke Ayotuntun	Culvert	1-Cell 3mx3.5m	Egbeda	1468
9	Alaro 7up RC	Bridge	1- Span @ 15m	South West	540
10	Believer RC	Bridge	5- Spans @ 15m	Oluyole	928
11	Elere	Culvert	1-Cell 3mx3.5m	Oluyole/Ona - Ara	934
12	Foworogi RC	Bridge	1- Span @ 15m	Oluyole/Ona - Ara	1062
13	Ogbere Moradeyo RC	Bridge	1- Span @ 15m	Oluyole/Ona - Ara	1252
14	Abonde Ogbere	Bridge	1- Span @ 15m	Ona Ara	851
15	Maje RC	Culvert	3-Cells 3mx3.5m	Soka Area, Oluyuole	724
16	Alaro Poly RC	Bridge	5- Spans @ 15m	Ido	644
17	Aroro Makinde, Arulogun, Isokun Ojoo	Culvert	2 - Cells 3mx3.5m	Akinyele	512
				Total	16, 594

Source: IUFMP, GIS Application Buffer and Authors Field Survey, 2024.

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3.3 Sample & Sampling Technique

The sample size for this study was chosen from the study population. Equal numbers of Bridge intervention projects and Culvert intervention projects were chosen randomly from the local government to have a mix of projects, and a mix of both the municipal local government and the sub urban local government areas which gave a sample size of 9, 069.

Table 3.3 List of Chosen Local Government Areas from the 17 Priority Project Intervention Sites

S/N	Location	Type of Crossing Structure	Hydraulic Structure	Local Government Areas	Housing Units within 500-meter radius
1.	Ola Adua	Culvert	2mx3m Triple Cell Culvert	Ido	838
2.	Cele Rainbow	Culvert	2mx3m Triple Cell Box Culvert	Oluyole	1, 026
3.	Ogbere Pegba	Bridge	90m^2 Bridge, 2x15m	Ona Ara	1, 099
4.	Ebenezeri RC	Bridge	1- Span @ 15m	Egbeda	1, 454
5.	Olorungunwa	Culvert	2Nos(3x3.5)+2Nos (2.5x2.5)	Egbeda	1,094
6.	Alaros 7up RC	Bridge	1- Span @ 15m	South West	540
7.	Believer RC	Bridge	5- Spans @ 15m	Oluyole	928
8.	Elere	Culvert	1-Cell 3mx3.5m	Oluyole/Ona – Ara	934
9.	Alaro Poly RC	Bridge	5- Spans @ 15m	Ido	644
10.	Aroro Makinde, Arulogun, Isokun Ojoo	Culvert	2 - Cells 3mx3.5m	Akinyele	512
				Total	9, 069

Source: IUFMP, GIS Application Buffer and Authors Field Survey, 2024

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Respondents for this study comprised of only residents, landlords or tenants within the selected areas. Visitors were not administered such questionnaire.

A random sampling technique was considered so that all homeowners and tenant were given equal chance of being selected/included in this study. The sample size for this study was determined using the Taro Yamane formula which is:

$$n = \frac{N}{1 + Ne^2}$$

Where: n = Sample size, N = Population, e = Error term =0.05

Thus, the sample size is n = 9069/ (1 + 9069 x 0.05^2) = 383 approximately

The sample is therefore Three Hundred and Eighty-Three (383) respondents. This was however shared on the bases of the ratio of housing stock per community to total housing stock multiplied by the sample frame. This was calculated thus:

Table 3.4: Number of Respondent Per Location

S/N	Location	Type of Crossing Structure	Local Government Areas	Housing Units within 500 meter radius	Ratio of Respondent from Location	No. of Respondent per Location
1.	Ola Adua	Culvert	Ido	838	838/9069 x 383	35
2.	Cele Rainbow	Culvert	Oluyole	1, 026	1026/9069 x 383	43
3.	Ogbere Pegba	Bridge	Ona Ara	1, 099	1099/9069 x 383	47
4.	Ebenezeri RC	Bridge	Egbeda	1, 454	1454/9069 x 383	61
5.	Olorungunwa	Culvert	Egbeda	1,094	1094/9069 x 383	46
6.	Alaro 7up RC	Bridge	South West	540	540/9069 x 383	23
7.	Believer RC	Bridge	Oluyole	928	928/9069 x 383	39
8.	Elere	Culvert	Oluyole/Ona – Ara	934	934/9069 x 383	40
9.	Alaro Poly RC	Bridge	Ido	644	644/9069 x 383	27
10.	Aroro Makinde, Arulogun, Isokun Ojoo	Culvert	Akinyele	512	512/9069 x 383	22
			Total	9, 069		383

Source: Authors Field Survey 2024

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Estate Surveyors and Valuers firms that are registered by the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON), were also surveyed. They gave insight into the property value trend as they are the professionals authorized by the 'Board' to carry out property valuation in the Federal Republic of Nigeria.

A purposive sampling method was used in this study to select and administer questionnaires to all the Estate Surveyors and Valuers firms in this study area registered with the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) as seen in the Boards 2022 register/directory to be 34 members. Also, three (3) top officials of IUFMP were interviewed to get data on the projects profile and solicit information about the management strategies put in place by the IUFMP for the provided projects amongst other relevant information.

3.4 Validity of the Research Instrument

The validity of a data collection tool reflects its capacity to measure what it claims to measure accurately. In this study, the validity of the instrument was confirmed through expert judgment. The study supervisor, who is well-versed in the subject matter, reviewed and approved the instrument, ensuring that it met the study's objectives. Items that did not contribute to these objectives were removed based on the supervisor's evaluation. The questionnaire was designed using simple, clear language to facilitate understanding and ease of response. The instrument's content, construct, concurrent, and predictive validity were all certified by the project supervisor, indicating a high degree of accuracy in the measurement tool.

3.5 Reliability of the Research Instrument

In order to obtain dependability, the Cronbach Alpha Coefficient Technique was employed to measure the consistency of the testing instrument. A pre-test was carried out for internal

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consistency measuring, using Cronbach's alpha coefficient which was adopted for measuring reliability of all the variables. Cronbach Alpha confirmatory factor coefficients vary from 0.00 to 1.00, with any rating greater than 0.7 suggesting that the testing scale is valid.

3.6 Description of the Research Instrument

The survey began with an introductory and consent page which would contain the broad objectives and topic of the research. It also contained the information on how data collected was used. Only respondents who consented to the research agreement were allowed to move to the main page. The survey only requested limited information about participants like age - band, sex, occupation, marital status, etc. Also, a minimum participatory question (years of experience) was asked. If the answer is not satisfactory, such a response is discarded from analysis.

Structured questionnaires were tailored to capture all aspects of the research objectives and to determine the impact of the urban flood management intervention project on property values. In this study, standardized instruments (questionnaires) were used to collect data from a target population in a relatively short period of time. The questions in the instrument are mostly closed so as to guide the thoughts of the respondent in giving a standardized response. A demerit of the method of closed-ended questionnaire is that it imposes the idea of the author hence there might be a component of the author's bias[3]. However, this limitation has been mitigated in this study as the questions used are already standardized and reliable instruments. The instrument also contains a 5point Likert-scale which gives the respondents a wide range of responses to select from. The Likert scale was used because respondents can quickly and easily fill it out against the open-ended questions.

Also, there was a question guide for the Key informant interview for the officials of the IUFMP.

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3.7: Method of Data Collection

3.7.1: Data Requirement by Objectives

Objective One: examine the social-economic characteristics of the projects' stakeholders in Ibadan Nigeria,

Data Required: The data that was solicited for here are those that describe the socio-economic characteristics of projects' stakeholders of IUFMP in Ibadan, Oyo State. This includes socio demographic data of all respondents for this reserch.

Objective Two: assess the projects' profile and flood management strategies put in place for mitigating flood risk in the study area

Data Required: The data that was solicited here are those that relate to the profile of projects and strategies put in place to mitigate against flood and flooding in the study area and this include either structural or engineering works or non-structural engineering, management and maintenance plans for the project's sustainability, etc. This was sorted from residents, estate surveyors and valuers and the Key Informants, which are the top officials of the IUFMP.

Objective Three: To determine the pattern/trend of property values in study area, between 2012 and 2022

Data Required: The data that was solicited here includes rental value and capital value trends between the years of 2012 to 2022. This was solicited from the registered Estate Surveyors and Valuers within the study area, and this was from their evidence of valuation, sales, and letting within the space of time. This was also solicited from Landlords and Tenants within the study area.

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Objective Four: To examine the effect of urban flood management on the values of properties in the study area

Data Required: The information that was solicited here include increase in vehicular and human movement in and out of the study area, an increase in business and economic activities within the area, less damage to buildings, dirt, and filthiness within the study area, etc.

3.8 Method of Data Analysis

The data collected was analyzed using both descriptive and inferential statistical methods. The IBM-SPSS version 25 statistical software was used for both data entry and to generate descriptive and inferential results. The purpose of the use of this software is for proper handling, transformation, accuracy, and reproducibility of the volume of data collected and analyzed, the software derives these results faster and precisely better than when done manually. The descriptive statistics will entail the use of frequency tables, percentages, bar charts, and pie charts. The key informant interview was carefully interpreted, processed, and analyzed too.

Method of Analysis for First Research Objective

The first research objective is to examine the socio-economic characteristics of the project's stakeholders in Ibadan, Oyo State. Data for this objective was gathered in section A of the questionnaire of respondents from homeowners, landlords and tenants, estate surveyors and valuers, and IUFMP officials. The frequency and percentage methods were used to list the identified characteristics.

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Method of Analysis for Second Research Objective

The second research objective was to assess the profile of projects and flood management strategies put in place for mitigating the flood risks in the study area. The study area respondents, estate surveyors, valuers, and in-depth interviews of the IUFMP completed a questionnaire, the items related to this were evaluated per site using frequency and percentages to summarize the outcome information.

Method of Analysis for Third Research Objective

To determine the pattern/trend of property values in the study area. Data for this objective was captured in section B of the questionnaire to Estate Surveyors and valuers. The trend analysis was used to examine this objective.

Method of Analysis for Fourth Research Objective

Examining the effect of urban flood management on the values of properties in the study area. This was captured on both the section B of the questionnaire of Estate Surveyors and Valuers and section B of respondents from homeowners, landlords and tenants, and also from the in-depth interview with the IUFMP staff. The responses were triangulated for an increase in the validity and reliability of the result.

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Endnotes

1. D., Maragno, M., Gaglio, M., Robbi, F., Appiotti, E.A., Fano, & E., Gissi. *Fine-scale analysis of urban flooding reduction from green infrastructure: An ecosystem services approach for the management of water flows.* **Ecological modelling,** 386, 2018, pp.1-10.

2. S.K., Kim, P., Joosse, M.M., Bennett, & T., van Gevelt. *Impacts of green infrastructure on flood risk perceptions in Hong Kong.* **Climatic change,** 162, 2020, pp.2277-2299.

3. R., Weber, *The rhetoric of positivism versus interpretivism: A personal view.* **Management Information Systems Research Center,** University of Minnesota. Vol 28, No. 1, March, 2024.

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Chapter Four

Results and Discussion of Findings

The present chapter focuses exclusively on the examination and interpretation of the data derived from the survey conducted in order to fulfil the objectives outlined in the study. Within the confines of this particular chapter, a comprehensive analysis was conducted, wherein each objective was meticulously analyzed. The requisite data was subjected to thorough examination, and subsequently, the findings were subjected to a comprehensive discussion.

4.1 Demographic Data Analysis

4.1.1 Schedule of Questionnaire Administration and Retrieval

For this study, a total number of 383 questionnaires was administered on respondents residing within the selected IUFMP priority intervention sites. This is however tabulated below:

Table 4.0: Questionnaire Response Rate

S/N	Study Area	Number of Questionnaire Distributed	No of Questionnaire Retrieved	Percentage %
1.	Ola Adua	35	35	100%
2.	Cele Rainbow	43	43	100%
3.	Ogbere Pegba	47	47	100%
4.	Ebenezeri RC	61	61	100%
5.	Olorunguwa	46	46	100%
6.	Alaro 7up RC	23	23	100%
7.	Believers RC	39	39	100%
8.	Elere	40	40	100%
9.	Alaro Poly RC	27	27	100%
10.	Aroro Makinde, Arulogun, Isokun, Ojoo	22	22	100%
	Total	383	383	100%
	Estate Surveyors and Valuers	34	34	100
	IUFMP Officials	3	3	100

Source: Author's Field Survey, 2024

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Table 4.0 shows the questionnaires that were administered and the corresponding quantity that was successfully retrieved. A total of 383 questionnaires were distributed to residents (Landlords/Tenants) of the 10 selected IUFMP intervention areas and all the questionnaires were retrieved, this was aided by the employment and training of research assistants used in this study. In the context of Estate Surveying and Valuation firms, a total of thirty-four questionnaires were distributed among the participants and all was also retrieved. Also, three top officials of the IUFMP agency were interviewed as key informant and this was cleaned and used to triangulate the response from the study area and that of the estate surveyors and valuers. Based on the available data, it can be inferred that the proportion of the questionnaires that were returned is deemed suitable for the purpose of conducting this analysis.

4.2. Presentation of Data – Objective One

4.2.1 Socio-Economic Characteristics of Respondents in the Study Area

The socio-demographic characteristics of the respondents in the study area are detailed in Table 4.1. This analysis is based on a sample size of 383 respondents selected from the 10 priority project sites chosen for this research. The findings reveal that 43.9% of the respondents are male, while the remaining 56.1% are female. This revealed that female stay more at home in the study area than male. This may be due to the fact that males move out of their homes to pursue a living, while most females work from home or are majorly housewives. The majority of respondents also fall within the age range of 19-30 years, constituting 41% of the respondents. The age group of 31-45 years represents 19.1%, and those aged 46 and over constitute 33.9%, while respondents below the age of 18 make up 6% of the sample. This indicates that the study area has more younger residents, followed by the older age group. This may be accounted for by the fact that the areas are new sites e.g.

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Rainbow RC, Oluyole, while some other areas are very close to The Polytechnic, Ibadan and also University of Ibadan, i.e. Alaro and Apete. Regarding marital status, the study indicates that 51.7% of the respondents are married, 41.5% are single, 4.2% are divorced, and 2.6% are widowed. The shows that there are more married residents followed by single respondents. The occupation distribution among the respondents shows that 41.8% are technicians, 40.2% are engaged in trading, and the remaining 18% fall into other occupational categories. The occupation distribution shows that there are more technicians and traders indicating that most residents of the study area do not engage in white-collar jobs. In terms of educational attainment, 25.3% have completed primary education, 48.3% possess WASC/GCE/NECO qualifications, 17.2% have NCE/OND/ND certifications, and 9.1% hold HND/B.Sc. degrees. The indication of this is that majority of the resident in the study area are not highly educated while just a tranche holds a Polytechnic or University degree.

The monthly income levels of the respondents vary, with 44.6% earning below ₦30,000, 42.3% earning ₦31,000 – ₦50,000, and 13.1% earning ₦51,000 – ₦100,000. The income levels also buttress the point that majority of the residents are engaged in trading and technicians, and also the that they are not highly educated. The ownership structure of the respondents' residences reveals that 61.4% are landlords, while 38.6% are tenants. This buttress the fact that majority of the areas are new areas opening up. The distribution of respondents across various locations in the project areas include Ola Adua (9.1%), Cele Rainbow (11.2%), Ogbere Pegba (12.3%), Ebenezeri RC (15.9%), Olorungunwa (12%), Alaro 7up RC (6%), Believer RC (10.2%), Elere (10.4%), Alaro Poly RC (7%), and Aroro Makinde, Arulogun, Isokun Ojoo (5.7%).

These findings provide a detailed overview of the demographic composition of the respondents and their characteristics, laying the groundwork for a thorough analysis of the

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impact of the Ibadan Urban Flood Management Project on property values in the selected project areas.

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Table 4.1 Socio-Economic characteristics of respondents in the Study Area.

Basic Characteristics of Respondents	Frequency (383)	Percent (%)
Gender of Respondent		
Male	168	43.9
Female	215	56.1
Total	**383**	**100**
Age		
Below18	23	6
19-30	157	41
31-45	73	19.1
46 and over	130	33.9
Total	**383**	**100**
Marital Status		
Married	198	51.7
Single	159	41.5
Divorced	16	4.2
Widow	10	2.6
Total	**383**	**100**
Occupation of Respondent		
Technician	160	41.8
Trading	154	40.2
Others	69	18
Total	**383**	**100**
Education Level		
Primary	97	25.3
WASC/GCE/NECO	185	48.3
NCE/OND/ND	66	17.2
HND/B.Sc.	35	9.1
Total	**383**	**100**
Monthly Level of Income		
Below ₦30,000	171	44.6
₦31,000 – ₦50,000	162	42.3
₦51,000 – ₦100,000	50	13.1
Total	**383**	**100**
Ownership		
Landlord	235	61.4
Tenant	148	38.6
Total	**383**	**100**
Location		
Ola Adua	35	9.1
Cele Rainbow	43	11.2
Ogbere Pegba	47	12.3
Ebenezeri RC	61	15.9
Olorungunwa	46	12
Alaro 7up RC	23	6

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Believer RC	39	10.2
Elere	40	10.4
Alaro Poly RC	27	7
Aroro Makinde, Arulogun, Isokun Ojoo	22	5.7
Total	**383**	**100**

Source: Author's Field Survey, 2024

4.2.2: Socio-Economic Characteristics of Estate Suveyors and Valuers

In this study, a second sample survey was carried out among 34 estate suveyoes and valuers. In the surveyed group of professionals, the majority, comprising 85.3%, were male, while 14.7% were female. Looking at the age distribution, a small fraction, accounting for 2.9%, fell below the age of 25. The largest portion, at 41.2%, belonged to the age group of 41 to 60, closely followed by those aged between 26 and 40, constituting 38.2%. Meanwhile, individuals over 60 years old made up 17.6% of the respondents. When it comes to their positions in the companies they work for, 41.2% held the esteemed role of Principal Partner, while 47.1% served as Managers. A smaller segment, 11.8%, identified themselves as Surveyors.

On their professional experience, a notable 26.5% of the surveyed individuals reported having less than 10 years of experience, whereas 29.4% had been working for 10 to 20 years, and the majority, at 44.1%, boasted over two decades of professional experience. Educationally, the respondents varied, with 17.6% having obtained an HND, 41.2% holding a BSc, 32.4% possessing an M.Sc, and 8.8% having achieved a Ph.D. In the realm of professional qualifications, 61.8% of the individuals identified themselves as Fellows, while the remaining 38.2% held the title of Associates.

Lastly, the respondents were spread across various locations, each contributing approximately 8.8% to the total distribution. These locations included Ola Adua, Cele Rainbow, Ogbere Pegba, Ebenezeri RC, Olorungunwa, Alaro 7up RC, Believer RC, Elere, Alaro Poly RC, Aroro Makinde, Arulogun, Isokun Ojoo.

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This comprehensive overview provides a detailed snapshot of the demographic and professional characteristics of the surveyed group of estste surveyors and valuers.

Table 4.2 Socio-Economic Characteristics of Estate Surveyors and Valuers

Basic Characteristics of Surveyors and Valuers	Frequency (34)	Percent
Gender of Surveyor/Valuer		
Male	29	85.3
Female	5	14.7
Total	**34**	**100**
Age		
<25	1	2.9
26-40	13	38.2
41-60	14	41.2
>60	6	17.6
Total	**34**	**100**
Position in the Company		
Principal Partner	14	41.2
Manager	16	47.1
Surveyor	4	11.8
Total	**34**	**100**
Years of Experience		
<10	9	26.5
10 to 20	10	29.4
>20	15	44.1
Total	**34**	**100**
Education Level		
HND	6	17.6
BSc	14	41.2
M.Sc	11	32.4
Ph.D.	3	8.8
Total	**34**	**100**
Professional Qualification		
Fellow	21	61.8
Associate	13	38.2
Total	**34**	**100**
Location		
Ola Adua	3	8.8
Cele Rainbow	3	8.8
Ogbere Pegba	5	14.7
Ebenezeri RC	3	8.8
Olorungunwa	6	17.6
Alaro 7up RC	2	5.9

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Believer RC	3	8.8
Elere	3	8.8
Alaro Poly RC	3	8.8
Aroro Makinde, Arulogun, Isokun Ojoo	3	8.8
Total	**34**	**100**

Source: Author's Field Survey, 2024

4.2.3: Socio-Economic Characteristics of IUFMP Officials

Position and Involvement

The respondents held diverse positions within the IUFMP, including roles such as Environmental Assistant, GIS Specialist, Project Engineer, Civil Engineer, and Project Monitoring and Evaluation Specialist. While departments in the IUFMP are Technical, safeguard, communication, monitoring and evaluation, Fiduciary, Procurement, Administration, ICT, and Accounting among others. Their diverse roles allowed for a comprehensive understanding of the project's various aspects.

4.3. Presentation of Data – Objective Two

4.3.1 Profile of Projects and Management Strategies of Ibadan Urban Flood Management Projects from Respondents in Study Area

The profile of the Ibadan Urban Flood Management Project (IUFMP) selected projects in the study areas are presented in Table 4.3, shedding light on the Types of flood management projects implemented in the study area, the awareness levels, community engagement, project execution, and the perceived impact on projects within the study area.

The awareness of the Ibadan Urban Flood Management Project among respondents is diverse. Notably, 25.1% were not aware, 25.6% were slightly aware, 11.2% were somewhat aware, 13.6% were moderately aware, and 24.5% were extremely aware. A parallel pattern is observed concerning awareness of the specific intervention projects in their area or community, with 6.8% not aware, 12.3% slightly aware, 19.1% somewhat aware, 26.1%

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moderately aware, and 35.8% extremely aware. For those aware of the project, the executed projects primarily consist of bridges (48.6%) and culverts (51.4%). The duration of project execution varies, with 63.7% reporting a one-year duration, 17.2% two years, and 19.1% three years.

Respondents' express satisfaction with the projects, as 13.1% are not satisfied, 8.1% are slightly satisfied, 36.8% are moderately satisfied, 4.2% are very satisfied, and 37.9% are extremely satisfied. Consultation with the community before project commencement was reported by 29% and 37.9% somewhat consulted. The role of the community in implementation reveals 3.9% others, 76.5% no contribution, and 19.6% non-financial contribution.

Table 4.3 Profile of Projects and Flood Management Strategies of Ibadan Urban Flood Management projects in the Study Area

Characteristics of Ibadan Urban Flood Management selected projects in the study areas	**Not Aware**	**Slightly Aware**	**Somewhat Aware**	**Moderately Aware**	**Extremely Aware**
Are you aware of Ibadan Urban Flood Management Project (IUFMP) in Oyo State?	96(25.1%)	98(25.6%)	43(11.2%)	52(13.6%)	94(24.5%)
Are you aware of the Ibadan Urban Flood Management Project intervention project(s)done in your area/community	26(6.8%)	47(12.3%)	73(19.1%)	100(26.1%)	137(35.8%)
If aware, what project(s) have been done so far in your area/community?		Frequency	Percent		
Bridge		186	48.6		
Culvert		197	51.4		
Total		**383**	**100**		
How long has the project been executed? (Years)					
1		244	63.7		
2		66	17.2		
3		73	19.1		
Total		**383**	**100**		

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How satisfied are you with the project(s) developed?		
Not Satisfied	50	13.1
Slightly Satisfied	31	8.1
Moderately Satisfied	141	36.8
Very Satisfied	16	4.2
Extremely Satisfied	145	37.9
Total	**383**	**100**
Were the community members consulted before the project commenced?		
Not Consulted	127	33.1
Somewhat Consulted	145	37.9
Consulted	111	29.0
Total	**383**	**100**
If consulted, what was the role of the community in the implementation?		
Others	15	3.9
No Contribution	293	76.5
Non-Financial Contribution	75	19.6
Total	**383**	**100**

Source: Author's Field Survey, 2024

4.3.2 Profile of Projects and Flood Management Strategies of Ibadan Urban Flood Management Projects from Estate Surveyors and Valuers

The professionals were further surveyed to get the profile of the IUFMP and their flood management strategies. In the survey conducted on the awareness and impact of Ibadan Urban Flood Management Projects within a specific jurisdiction, a majority of respondents, totaling 67.6%, expressed their lack of awareness regarding any such projects in their area. Among those aware, the degree of awareness varied, with 8.8% being slightly aware, 2.9% somewhat aware, 8.8% moderately aware, and 11.8% extremely aware.

For those who were aware of the projects, the focus shifted to the specific interventions implemented in their communities. Notably, 82.4% reported the implementation of culvert projects, while 17.6% mentioned the existence of bridge projects.

The survey on the awareness and impact of the Ibadan Urban Flood Management Projects (IUFMP) among Estate Surveyors and Valuers reveals significant insights into the

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effectiveness and reach of these interventions. The findings indicate that a substantial majority, 67.6%, of professionals surveyed were unaware of any flood management projects within their jurisdiction. This lack of awareness among key stakeholders, who play a critical role in property valuation and urban planning, suggests a gap in communication and public engagement by the IUFMP.

The varying degrees of awareness among the remaining respondents, with only 11.8% being extremely aware, further underscores the limited visibility and dissemination of information regarding these flood management initiatives. This could potentially affect the overall impact and success of the projects, as the support and involvement of local professionals are crucial for the effective implementation and sustainability of flood management strategies.

For those who were aware, the findings highlight that the majority, 82.4%, recognized the implementation of culvert projects in their communities, while a smaller portion, 17.6%, identified bridge projects. This suggests that while some interventions are recognized, there may be a need for a more comprehensive approach that includes a wider range of flood management strategies and ensures that all stakeholders are adequately informed and involved.

Overall, the findings imply that the IUFMP may need to enhance its outreach and engagement efforts, particularly with key professionals like Estate Surveyors and Valuers, to improve awareness and support for the projects. This could lead to more effective flood management and a better understanding of the projects' impact on property values and urban development in Ibadan.

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Table 4.4 Profie of IUFMP Projects by Estate Surveyors and Valuers

Profile of IUFMP Projects	Frequency	Percent
Do you notice any Ibadan Urban Flood Management, Projects within your jurisdiction?		
Not Aware	23	67.6
Slightly Aware	3	8.8
Somewhat Aware	1	2.9
Moderately Aware	3	8.8
Extremely Aware	4	11.8
Total	**34**	**100**
If aware, what project(s) have been done so far, in your area/community?		
Bridge	6	17.6
Culvert	28	82.4
Total	**34**	**100**

Source: Author's Field Survey, 2024

4.3.3 Profile of Projects and Flood Management Strategies of Ibadan Urban Flood Management Projects by IUFMP Officials

The Director of the agency expatiated on the project and its two broad components which are structural and non-structural.

"Two components of the projects are structural and non-structural. The structural parts are the assets that can be seen with the eye, (bridges, culverts, dredging of channels) while the non-structural are more of strategies and systems put in place to ensure continuity and sustainability of the project. The non-structural contains elements such as the city master plan for Ibadan to rearrange the way physical structures are errected, distance to rivers, distance to road. It also involves creating a satalite town where people can relocate to, a drainage master plan which involves constructing culvets, bridges, dredging and expanding all Ibadan rivers, and the early warning system for floods (EWSF) forcasting the incidence of floods to give prior alerts for impending floods. The non-structural components also involves

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a masterplan to address the waste disposal system of Ibadan which is a main factor causing floods in Ibadan"

The interventions implemented by the IUFMP encompass a range of approaches, including hard engineering solutions (culverts, drainages, bridges) and soft engineering practices (afforestation, rainwater harvesting). While some respondents emphasized a balance between hard and soft engineering, others leaned toward a predominant use of hard engineering solutions. The agency began design preparation in 2014 while implementations were started in 2016 (Environmental Assistant).

The insights provided by the Director of the Ibadan Urban Flood Management Project (IUFMP) highlight the comprehensive approach taken by the agency, which includes both structural and non-structural components to address the challenges of urban flooding in Ibadan. The structural components, such as bridges, culverts, and dredging of channels, represent tangible interventions aimed at mitigating the immediate impacts of flooding. These visible assets are crucial for preventing floodwaters from inundating urban areas, thereby protecting lives and properties.

On the other hand, the non-structural components, which focus on strategies and systems, are equally vital for ensuring the long-term sustainability of these flood management efforts. These include the development of a city master plan, the creation of satellite towns to reduce urban density, a drainage master plan to systematically manage stormwater, and the implementation of an early warning system for floods (EWSF). These measures are designed to complement the structural interventions by addressing the underlying factors that contribute to flooding, such as improper waste disposal and unregulated urban expansion.

The emphasis on a balanced approach, incorporating both hard and soft engineering solutions, reflects the agency's recognition of the complex nature of urban flooding. While hard

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engineering solutions like culverts and bridges are essential for immediate flood control, soft engineering practices such as afforestation and rainwater harvesting play a crucial role in enhancing the city's resilience to future flood events.

However, the findings also suggest a potential leaning toward a predominant use of hard engineering solutions by some stakeholders, which could limit the effectiveness of the overall flood management strategy if not balanced appropriately. The success of the IUFMP depends on the integration of both approaches, ensuring that immediate needs are met while also laying the groundwork for sustainable urban development.

The commencement of design preparations in 2014 and the start of implementations in 2016 demonstrate the agency's proactive efforts in addressing the flooding issue. However, the effectiveness of these interventions will ultimately be measured by their ability to reduce the incidence and severity of flooding in Ibadan over time, as well as their impact on property values and the overall quality of life in the city. Continued monitoring and adjustment of these strategies will be essential to achieving long-term success.

4.4. Presentation of Data – Objective Three

4.4.1 Trends of Property Rental Values between 2012 and 2022

Table 4.5 provides a comprehensive overview of the trends in property rental values between 2012 and 2022 in selected project areas in Ibadan, Oyo State. The mean rent values for various property types are presented annually, offering insights into the fluctuation and evolution of rental values over the specified period.

In 2012, the mean rent value for a 1-room self-contained unit was 68,825.07, while a room and parlor rented for 40,587.47. The values increased for 2-bedroom flats (92,402.09), 3-bedroom flats (151,644.91), 4-bedroom flats (183,498.69), bungalows (179,686.68), shops (12,590.08), and offices (93,172.32). The subsequent years, up to 2015, witnessed

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fluctuations in mean rent values. Notably, 2016 experienced a significant increase across all property types, with the mean rent for a 1-room self-contained unit reaching 92,741.51. This upward trend continued in 2017, with the mean rent values for various property types showing consistent growth.

In 2018, there was a substantial increase in mean rent values, especially for 4-room flats (383,159.27) and bungalows (387,728.46). This spike in rental values persisted into 2019, with a remarkable increase in the mean rent for a 1-room self-contained unit, reaching 193,707.57. The year 2020 witnessed further fluctuations in mean rent values, with substantial increases for 3-room flats (301,958.22) and 4-room flats (523,629.24). The following years, 2021 and 2022, continued to show variations in mean rent values, reflecting the dynamic nature of the real estate market.

Particularly noteworthy is the substantial increase in the mean rent for a bungalow in 2022, reaching 684,334.20, suggesting significant changes in the rental landscape for this property type. Additionally, the mean rent for offices experienced a substantial increase in 2022, reaching 190,287.21. These trends in property values provide valuable insights for stakeholders and researchers studying the impact of the Ibadan Urban Flood Management Project on property values in the selected areas.

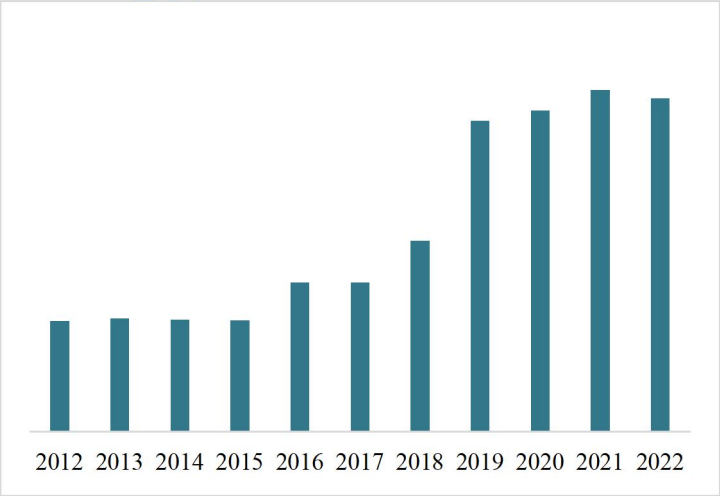

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Figure 4.1: Self-Contain Apartment

Source: Author's Field Survey, 2024

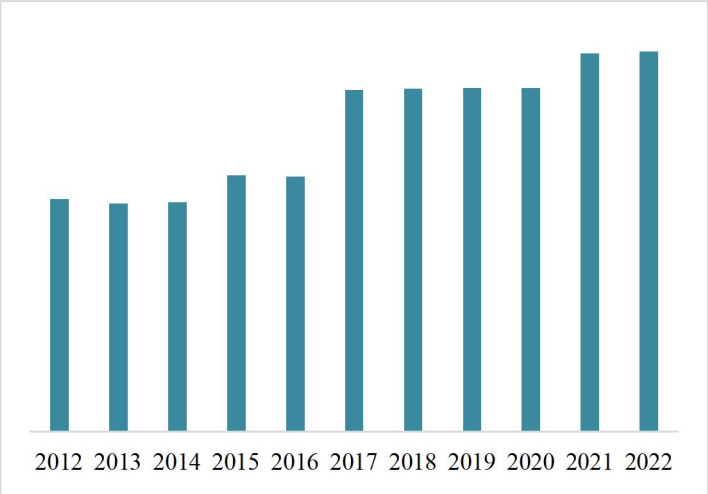

Figure 4.2: Room and Parlour German House

Source: Author's Field Survey, 2024

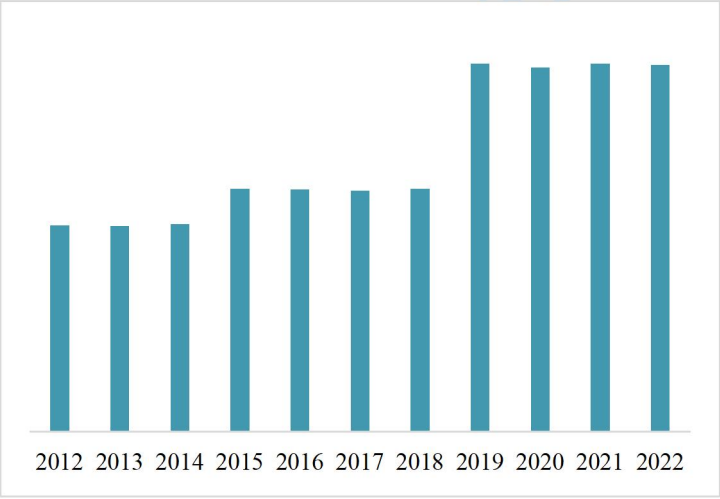

Figure 4.3: 2 Rooms Flat

Source: Author's Field Survey, 2024

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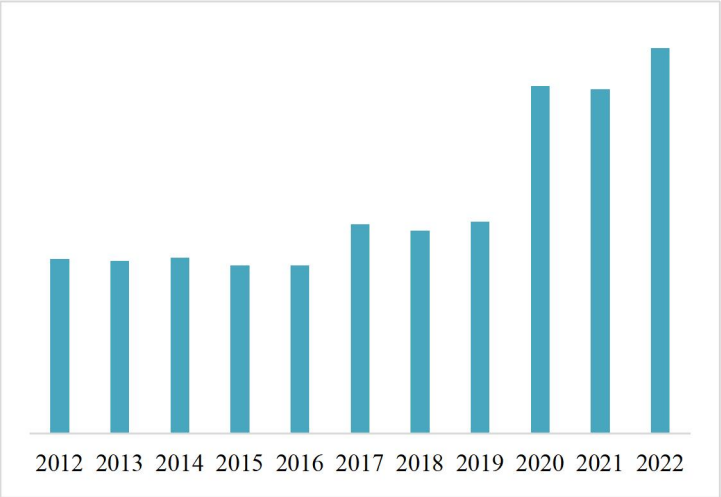

Figure 4.4: 3 Rooms Flat

Source: Author's Field Survey, 2024

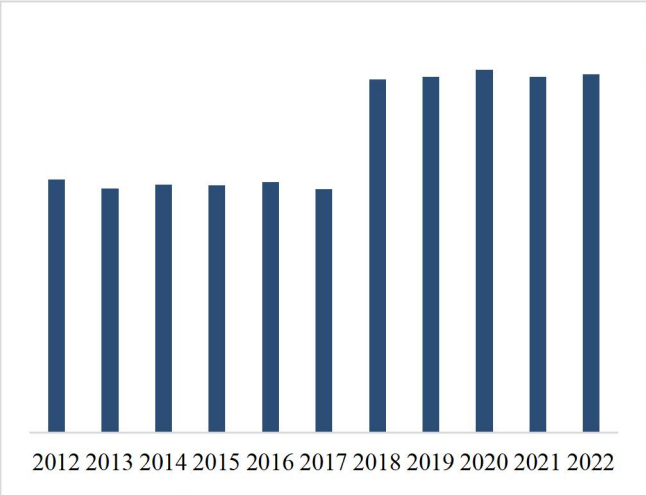

Figure 4.5: Shops

Source: Author's Field Survey, 2024

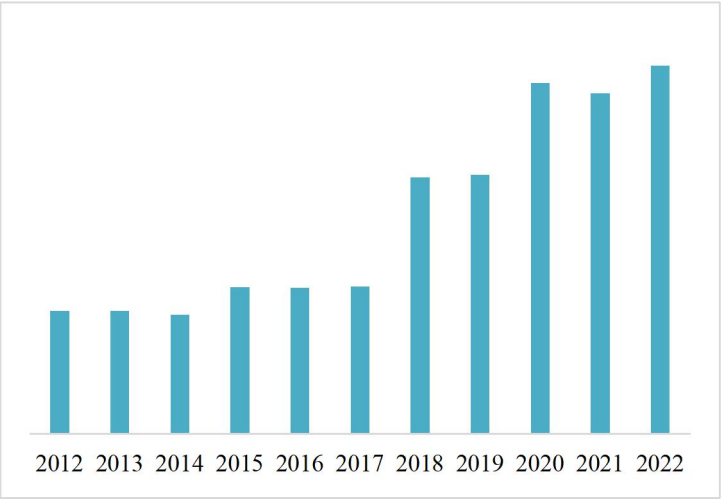

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Figure 4.6: 4 Rooms Flat

Source: Author's Field Survey, 2024

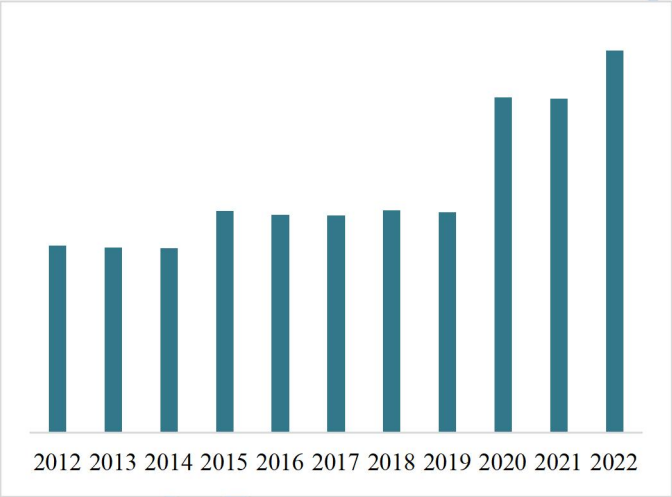

Figure 4.7: Offices

Source: Author's Field Survey, 2024

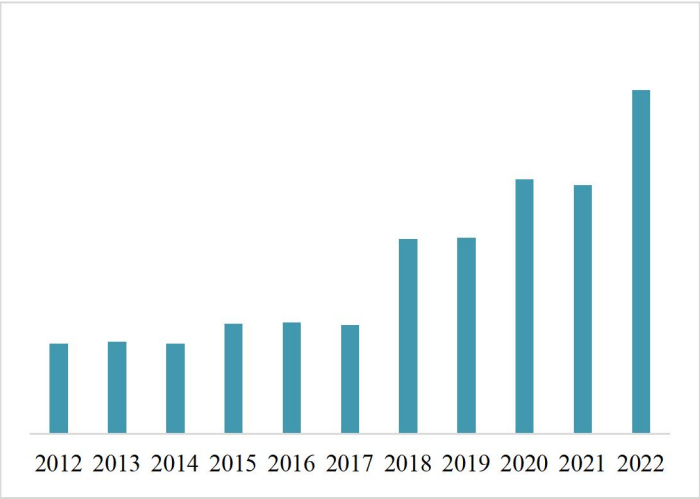

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Figure 4.8: Bungalow

Source: Author's Field Survey, 2024

Rent value (Mean)	1 Room Self Contain	Rent A room and parlor	2Rooms flat	Rent 3Rooms flat	Rent 4Rooms flat	Rent Bungalow	Rent Shops	Rent Offices
2012	68825.0653	40587.4674	92402.0888	151644.9086	183498.6945	179686.6841	12590.0783	93172.3238
2013	70626.6319	39778.0679	92167.1018	150261.0966	183211.4883	182428.1984	12159.2689	92245.4308
2014	69817.2324	40000	93080.9399	152767.624	177624.0209	178825.0653	12334.2037	91866.8407
2015	69268.9295	44772.846	108890.3394	146266.3185	218537.859	218851.1749	12326.3708	110326.3708
2016	92741.5144	44472.5849	108511.7494	146344.6475	217519.5822	221540.47	12469.9739	108407.3107
2017	92767.624	59582.2454	108146.2141	181906.0052	219347.2585	216266.3185	12125.3264	108250.6527
2018	119007.8329	59778.0679	109060.0522	176605.7441	383159.2689	387728.4595	17587.4674	110678.8512
2019	193707.5718	60000	164973.8903	184438.6423	386814.6214	390078.329	17715.4047	109595.3003
2020	199843.342	59934.7258	163263.7076	301958.2245	523629.2428	507049.6084	18052.2193	166827.6762
2021	212976.5013	65939.9478	165104.4386	299608.3551	508355.0914	495039.1645	17720.6266	166396.8668
2022	207676.2402	66331.5927	164464.752	335378.5901	549869.4517	684334.2037	17835.5091	190287.2063

Table 4.5 Trends of Property Rental Values between 2012 and 2022

Source: Author's Field Survey, 2024

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4.4.2 Trends of Property Capital/Market Values between 2012 and 2022

The Table 4.6 presents the trends in property capital or market values between 2012 and 2022 in selected project areas in Ibadan, Oyo State. The capital or market values for various property types are recorded annually, offering insights into the changes and developments in the real estate market over the specified period.

In 2012, the capital or market value for a self-contained unit was 8,172,950, and for a room and parlor German house, it was 4,637,337. The values increased for 2-room flats (10,839,334), 3-room flats (17,832,167), 4-room flats (21,294,648), bungalows (20,699,086), shops (1,414,817), and offices (10,990,183). The subsequent years, up to 2015, witnessed fluctuations in capital or market values. Notably, 2016 experienced a significant increase across all property types, with the capital or market value for a 1-room self-contained unit reaching 10,705,692. This upward trend continued in 2017, with the capital or market values for various property types showing consistent growth.

In 2018, there was a substantial increase in capital or market values, especially for 4-room flats (45,618,668) and bungalows (45,530,809). This spike in values persisted into 2019, with a remarkable increase in the capital or market value for a 1-room self-contained unit, reaching 26,447,232. The year 2020 witnessed further fluctuations in capital or market values, with substantial increases for 3-room flats (34,717,102) and 4-room flats (60,939,948). The following years, 2021 and 2022, continued to show variations in capital or market values, reflecting the dynamic nature of the real estate market. The significant rise in a bungalow's capital or market value in 2022—to 81,307,833—is especially notable. Furthermore, offices capital or market value increased significantly in 2022, hitting 22,444,334.

These trends in property capital or market values provide valuable insights for stakeholders and researchers studying the impact of the Ibadan Urban Flood Management Project on

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property values in the selected areas, as they highlight the dynamic nature of the real estate market in Ibadan, Oyo State, over the specified period.

Table 4.6 Trends of Property Capital/Market Values between 2012 and 2022

Capital/ Market value	Cap. Value Self Contained	Cap. Value room and parlor	Cap. Value 2Rooms flat	Cap. Value 3bedrooms flat	Cap. Value 4bedrooms flat	Cap. Value Bungalow	Cap. Value Shops	Cap. Value Offices
2012	8172950	4637337	10839334	17832167	21294648	20699086	1414817	10990183
2013	8013290	4805379	11000692	17627441	21020731	21311540	1429047	11099308
2014	8451619	4755470	11009478	18032924	21593185	20850131	1451366	10943460
2015	8243107	5281436	13060836	17829426	25172689	24887285	1426992	12757480
2016	10705692	5232875	12813695	17589426	26166136	25420209	1441198	12813238
2017	10733473	7054856	12869817	21297833	25474073	25824230	1444460	12837611
2018	13408042	6999856	12891162	21099191	45618668	45530809	2054347	12952480
2019	26447232	7135065	12949360	21384674	45217363	45890862	2036070	12865992
2020	25027050	7029243	19432833	34717102	60939948	59730026	2092193	19538355
2021	24660705	7703303	19471697	34768668	60042298	59404830	2076624	19184204
2022	24116319	7779869	19730822	38556527	64109661	81307833	2101104	22444334

Source: Author's Field Survey, 2024

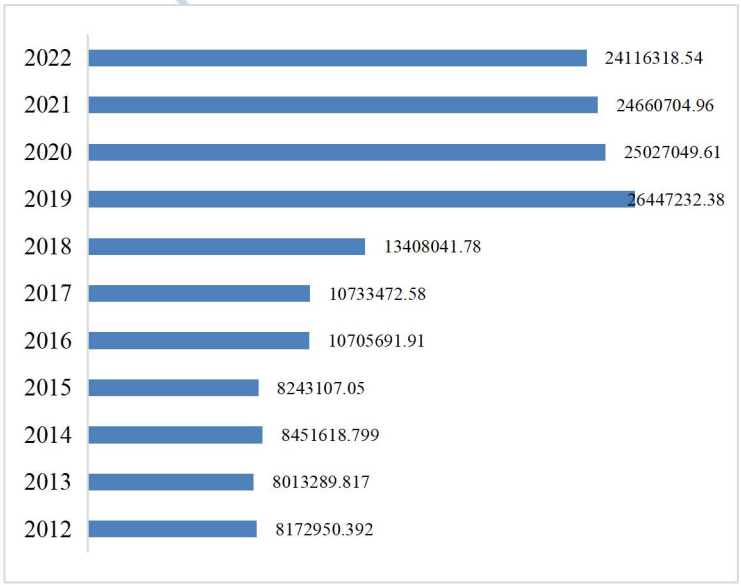

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Figure 4.9: Capital Value of Self-Contained Apartment

Source: Author's Field Survey, 2024

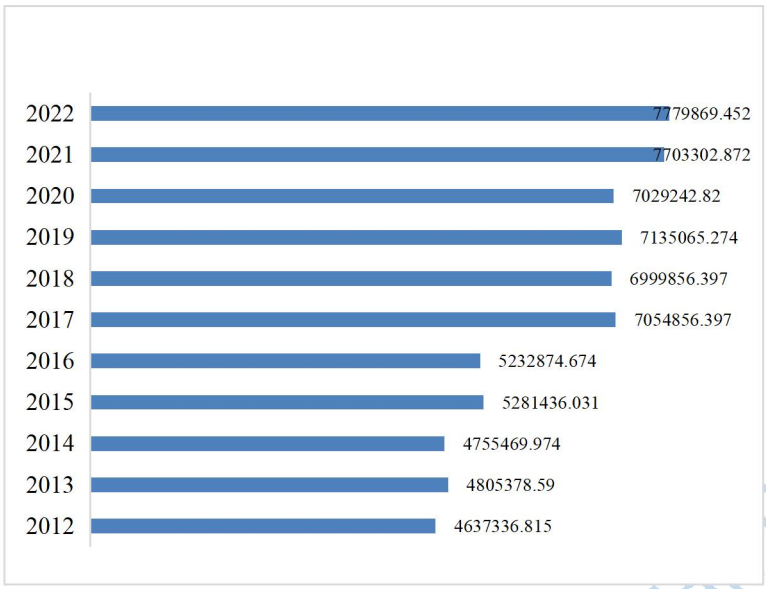

Figure 4.10: Capital Value of a Room and Parlour German House

Source: Author's Field Survey, 2024

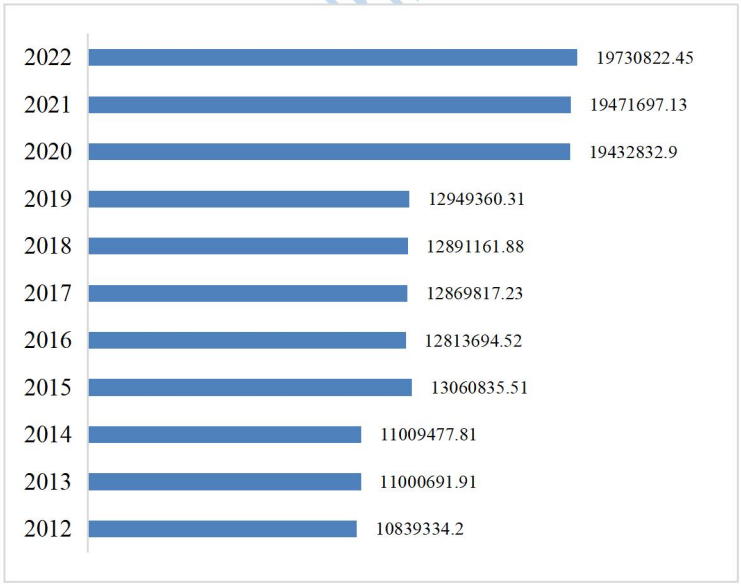

Figure 4.11: Capital Value of 2 Bedrooms Flat

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Source: Author's Field Survey, 2024

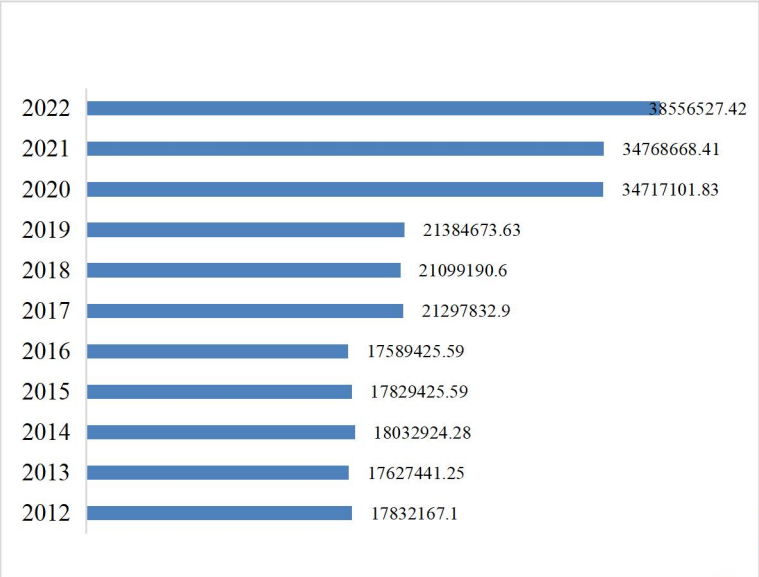

Figure 4.12: Capital Value of 3 Bedrooms Flat

Source: Author's Field Survey, 2024

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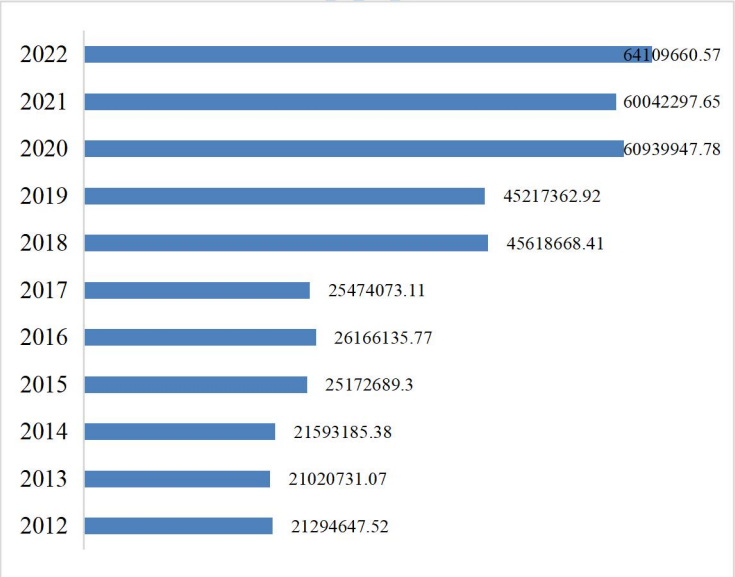

Figure 4.13: Capital Value of 4 Bedrooms Flat

Source: Author's Field Survey, 2024

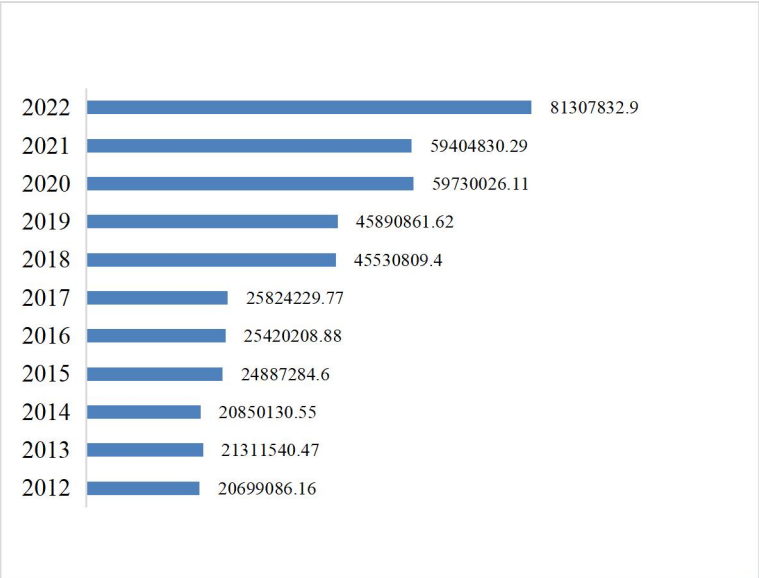

Figure 4.14: Capital Value of Bungalow

Source: Author's Field Survey, 2024

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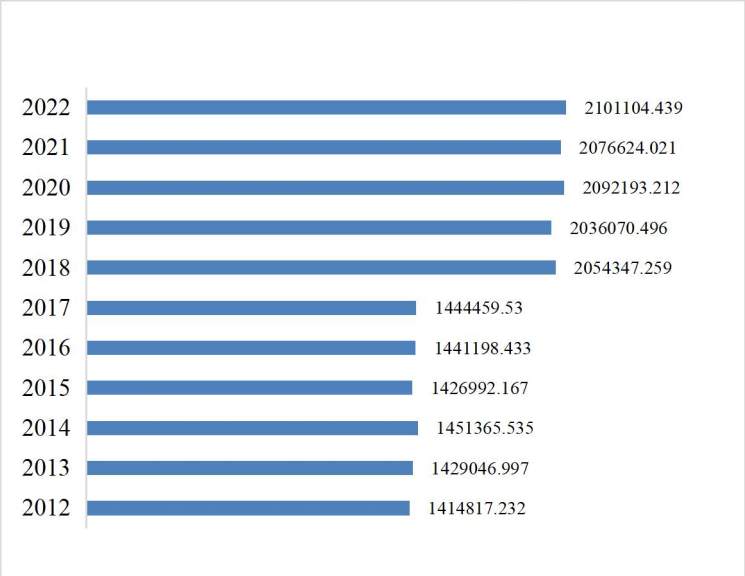

Figure 4.15: Capital Value of Shops

Source: Author's Field Survey, 2024

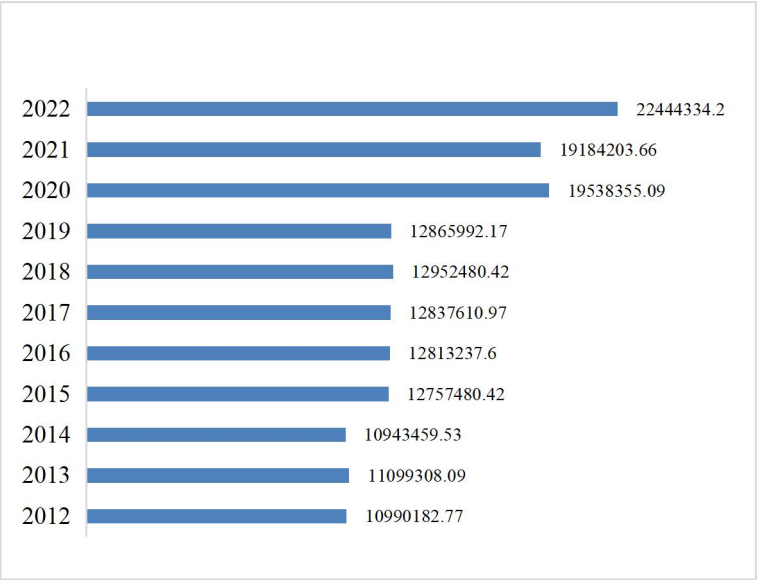

Figure 4.16: Capital Value of Offices

Source: Author's Field Survey, 2024

4.4.3 Rent of Properties per Location in the Study Area

The Table 4.7 provides insights into the average rental values of properties in selected project areas in Ibadan, Oyo State, from 2012 to 2022. The average rental value per location for different property types, offering an overview of the rental market dynamics over the specified period.

In the Ola Adua area, the average rental value varied across property types. For a self-contained unit, the average rental value ranged from 132,493.51 in 2012 to 147,747.04 in 2022. Similarly, for a room and parlor in a German house, the range was from 52,924.68 to 53,221.34. The fluctuations were consistent across other property types, including 2-bedroom flats, 3-bedroom flats, 4-bedroom flats, bungalows, shops, and offices. Notably, the average rental value showed an overall increasing trend, indicating a general upward trajectory in the rental market in Ola Adua. Cele Rainbow exhibited a similar trend, with incremental increases in average rental value for various property types from 2012 to 2022. For instance, the average rent for a self-contained unit increased fr om 133,298.10 to 147,747.04, while a

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room and parlor in a German house saw an increase from 52,291.75 to 53,221.34. This pattern of increasing average rental value was consistent across all property types in Cele Rainbow, indicating a positive trend in the rental market over the specified period.

Ogbere Pegba, Ebenezeri RC, Olorungunwa, Alaro 7up RC, Believer RC, Elere, Alaro Poly RC, and Ojoo also displayed variations in average rent for different property types from 2012 to 2022. While fluctuations occurred, the overall trend suggests an upward trajectory in average rental value across the selected project areas.

Table 4.7. Rental Values of Properties Per Location

Average Rent 2012 to 2022								
Location	**Self Contained**	**A room & parlor**	**2Rooms flat**	**3Rooms flat**	**4Rooms flat**	**Bungalow**	**Shops**	**Offices**
Ola Adua	132,493.51	52,924.68	126,597.40	203,870.13	327,428.57	334,389.61	14,961.04	124,350.65
Cele Rainbow	133,298.10	52,291.75	124,904.86	203,382.66	320,951.37	334,080.34	14,735.73	123,044.40
Ogbere Pegba	125,164.41	53,034.82	122,746.62	199,129.59	323,191.49	330,889.75	14,754.35	122,872.34
Ebenezeri RC	124,128.17	52,682.56	124,247.39	201,728.76	322,488.82	332,399.40	15,156.48	122,324.89
Olorungunwa	127,687.75	53,075.10	124,673.91	203,774.70	324,505.93	336,581.03	14,561.26	122,826.09
Alaro 7up RC	147,747.04	53,221.34	124,071.15	207,430.83	320,474.31	326,877.47	14,687.75	121,877.47
Believer RC	121,188.81	52,951.05	124,522.14	206,876.46	323,076.92	329,743.59	14,634.03	121,293.71
Elere	128,386.36	52,415.91	125,363.64	201,545.45	323,250.00	334,386.36	14,947.73	121,784.09
Alaro Poly RC	124,006.73	53,447.81	124,797.98	195,353.54	321,447.81	333,198.65	14,616.16	123,973.06
OJO	106,570.25	52,636.36	123,822.31	202,355.37	319,504.13	334,917.36	14,830.58	120,661.16

Source: Author's Field Survey, 2024

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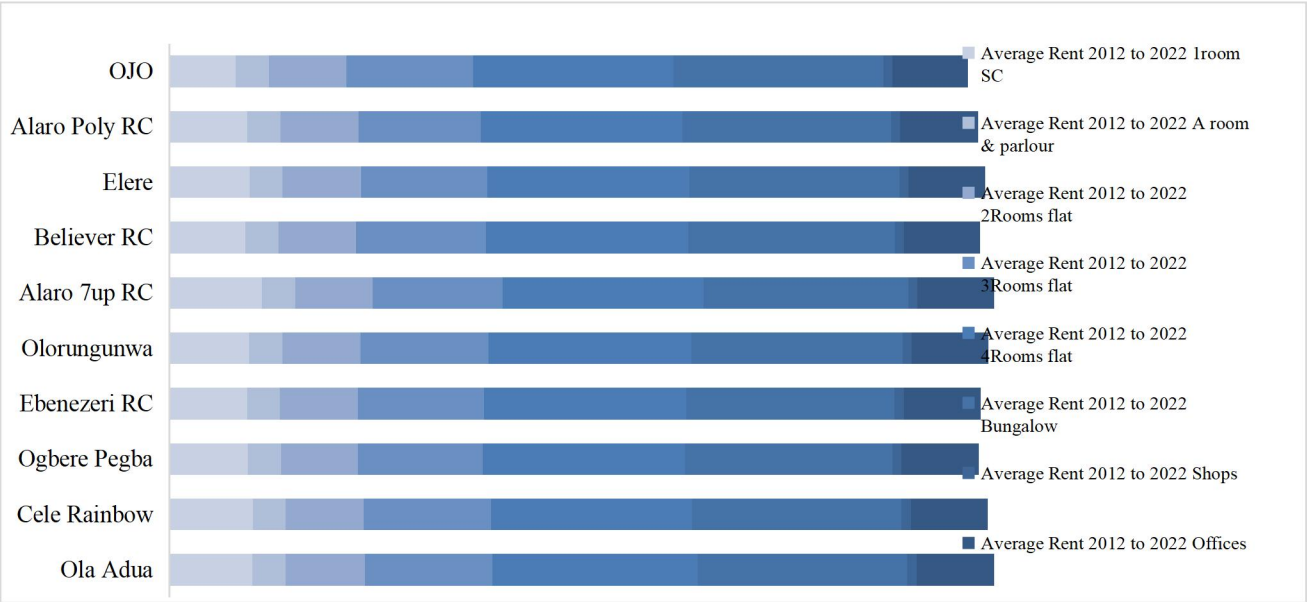

Figure 4.17: Average Rent 2012 to 2022

Source: Author's Field Survey, 2024

4.4.4 Capital Value of Properties per Location in the Study Area

The table 4.8 presents a summary of the average capital value / market price of properties in selected project areas in Ibadan, Oyo State, spanning the years 2012 to 2022. The recorded capital value / market prices are delineated by location and property type, providing a thorough examination of the real estate market dynamics throughout the specified period.

Within the Ola Adua area, discernible fluctuations in average capital value / market prices were noted across various property types. For instance, the average buy price for a self-contained unit ranged from 14,744,259.74 in 2012 to 17,019,360.27 in 2022. Similarly, a room and parlor exhibited a range from 6,143,766.23 to 6,254,606.06. These fluctuations were consistent across other property types, including 2-bedroom flats, 3-bedroom flats, 4-bedroom flats, bungalows, shops, and offices. The overall trend in average capital value/ market price indicated a progressive increase, highlighting a general upward trajectory in the real estate market within Ola Adua. Cele Rainbow mirrored this pattern, demonstrating

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incremental rises in average capital value/ market price for diverse property types from 2012 to 2022. Noteworthy examples include the average capital value/ market price for a self-contained unit, escalating from 14,702,896.41 to 17,019,360.27, and for a room and parlor, increasing from 6,184,778.01 to 6,254,606.06. This consistent upward trajectory in average capital value/ market price was observed across all property types in Cele Rainbow, signaling a positive trend in the real estate market over the specified period.

Similarly, Ogbere Pegba, Ebenezeri RC, Olorungunwa, Alaro 7up RC, Believer RC, Elere, Alaro Poly RC, and Ojoo displayed varying average capital value/ market price for different property types from 2012 to 2022. Despite fluctuations, the overarching trend suggests a progressive increase in average capital value/ market price across the selected project areas. In essence, these findings offer detailed understanding of the average capital value/ market price in various locations in Ibadan, Oyo State.

Table 4.8. Capital Value/ Market Price of Properties Per Area

Average BUY 2012 to 2022								
Location	**Self-Contained**	**A room & parlor**	**2bedrooms flat**	**3bedrooms flat**	**4bedrooms flat**	**Bungalow**	**Shops**	**Offices**
Ola Adua	14,744,259.74	6,143,766.23	14,363,857.14	23,596,389.61	37,279,090.91	38,769,922.08	1,699,415.58	14,413,623.38
Cele Rainbow	14,702,896.41	6,184,778.01	14,245,137.42	23,619,027.48	37,476,997.89	39,843,446.09	1,727,410.15	14,161,659.62
Ogbere Pegba	16,477,292.07	6,224,034.82	14,234,777.56	23,712,862.67	38,600,096.71	39,903,733.08	1,705,148.94	14,401,305.61
Ebenezeri RC	14,335,216.10	6,201,210.13	14,226,453.06	23,403,114.75	38,399,150.52	39,373,934.43	1,734,958.27	14,484,612.52
Olorungunwa	14,088,596.84	6,214,820.16	14,081,511.86	23,952,272.73	37,357,529.64	39,157,411.07	1,732,545.45	14,586,294.47
Alaro 7up RC	16,805,573.12	6,284,861.66	14,244,466.40	23,899,090.91	37,043,992.09	38,347,312.25	1,785,833.99	14,120,810.28
Believer RC	16,157,529.14	6,208,925.41	14,085,920.75	24,124,219.11	38,483,613.05	39,645,664.34	1,675,331.00	14,571,013.99
Elere	14,668,818.18	6,242,654.55	14,070,625.00	23,816,477.27	37,557,409.09	38,727,931.82	1,723,470.45	14,442,397.73
Alaro Poly RC	17,019,360.27	6,254,606.06	14,088,703.70	23,472,491.58	38,491,279.46	38,551,313.13	1,766,565.66	14,233,737.37

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OJO	15,480,123.97	6,324,190.08	14,272,582.64	23,454,586.78	37,330,123.97	37,942,644.63	1,725,500.00	14,375,103.31

Source: Author's Field Survey, 2024

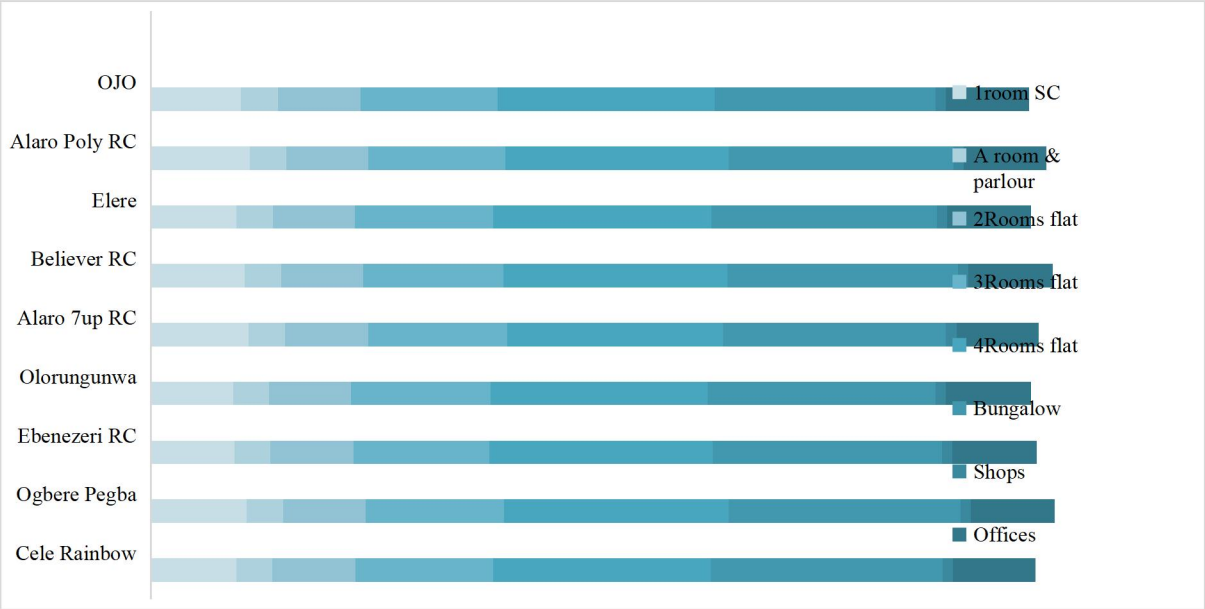

Figure 4.18: Average Capital Values/Market Prices of Apartment Per Location

Source: Author's Field Survey, 2024

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4.4.5 Trend of Property Values as Presented by Estate Surveyors and Valuers

4.4.5.1 Trend of Property Rental Values

The past decade has seen a transformative journey in the rental landscape of various apartments and commercial spaces across different areas in Ibadan. The figure 4.7 showcases the average rental values from 2012 to 2022, distinct narratives emerge for each property type. The rental values of a self-contained is one of fluctuating values. From a peak in 2013 to a trough in 2017, the prices meander through the years. Stability emerges in the latter part of

the decade, hinting at a potential equilibrium in the demand and supply dynamics. A subtle rise in 2021 and 2022 may signify a renewed interest in these compact living spaces.

Resilience characterizes the narrative of a room and parlour apartment. Despite a dip in 2016, the subsequent years witness a consistent upward trajectory. The allure of these mid-sized living spaces remains intact, with 2022 marking a pinnacle in rental prices, reflecting sustained demand.The journey of the 2-bedroom flat is marked by fluctuations. A peak in 2018 is followed by a noticeable descent, indicating potential shifts in preferences or market dynamics. The decreasing trend may prompt a closer examination of the factors influencing the demand for this particular housing type.

The 3-bedroom flat narrative paints a picture of peaks and troughs. Climaxing in 2014, a dip follows in 2015, paving the way for a steady climb. The pinnacle in 2022 suggests an increasing demand for more spacious living arrangements, possibly driven by evolving housing needs. Rental prices for 4-bedroom flats dance to the rhythm of peaks and valleys. A crescendo in 2015 is followed by a dip in 2016, yet the values ascend steadily until 2022. The tale speaks to the allure of spacious living, with 2021 standing out as a zenith.

Bungalows, with their distinct charm, reveal a narrative of peaks and troughs. A summit in 2015 gives way to a trough in 2016, and then the values ascend dramatically until 2021. However, an unexpected descent in 2022 adds a twist to the story, leaving questions about the factors influencing this housing type. Commercial spaces narrate a story of steady ascent, with a noticeable peak in 2018. Despite some fluctuations, the values consistently rise until 2022, underlining the enduring demand for these business hubs.

The saga of office rentals is one of resilience and growth. After a dip in 2012 and 2013, the values steadily climb, with 2021 emerging as a pinnacle. The narrative suggests a robust demand for office spaces, potentially influenced by evolving business landscapes.

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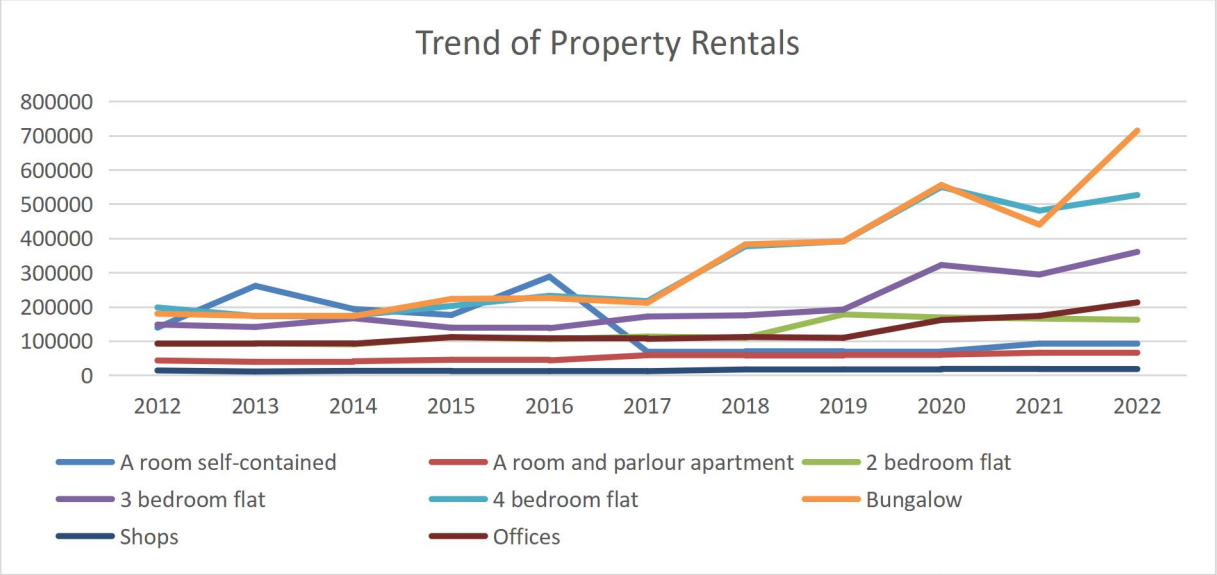

Figure 4.19 Trend of Property Rental Value in IUFMP Study Area

Source: Author's Field Survey, 2024

4.4.5.2 Trend of Property Capital Values

Over the course of a decade, from 2012 to 2022, the real estate landscape has witnessed a dynamic ebb and flow, reflected in the average Values of diverse property types. The figure 4.8 displays a narrative journey through these values and periods. In the area of compact living, a self-contained saw its value peak in 2015, only to experience a subsequent dip in the following years. However, resilience marked its trajectory, with a modest resurgence after 2017, hinting at evolving preferences or market forces at play.

The charm of a room and parlour apartment enticed buyers in the early years, with values steadily climbing from 2012 to 2014. A temporary setback in 2015 gave way to a consistent upward trend, reaching new heights by 2022. This echoes a tale of sustained interest in this particular housing category. For those seeking a bit more space in a 2-bedroom flat, the journey was one of ascent. Despite some undulations, value surged notably in 2020, suggesting a heightened demand or perhaps a shift in housing preferences during that period.

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On larger apartments, the 3-bedroom flat exhibited a captivating dance of values. A surge from 2012 to 2014, a dip in 2015, and a subsequent climb marked its narrative. However, a twist in the tale unfolded in 2022, as prices took a dip, leaving observers to ponder the factors behind this deviation.

The 4-bedroom flat, a symbol of spacious living, experienced a rollercoaster ride. Peaks in 2017 and 2019, along with a noticeable dip in 2018, painted a picture of fluctuating demand and market dynamics. By 2022, the trajectory suggests a continued allure but with a touch of unpredictability.

Bungalows, with their distinct charm, showcased resilience in value. The years 2015 to 2017 witnessed a significant surge, making them the pinnacle of real estate luxury. By 2022, bungalows commanded the highest prices, a testament to their timeless appeal.

Shops, serving as commercial hubs, mirrored the economic tides. Peaks and troughs punctuated their journey, with a significant surge in 2015. The narrative speaks to the intertwined destinies of commercial spaces and the economic currents shaping them.

Offices, the epicenters of business activity, faced their own narrative. Peaks in 2017 and a subsequent dip in 2018 hinted at the complex dance between demand and supply. Yet, an overall rise indicated the enduring significance of these spaces in the evolving business landscape.

Conclusively, these property types unfolds as a tapestry woven with economic shifts, changing preferences, and the ever-evolving dynamics of the real estate market. The journey from 2012 to 2022 encapsulates a decade of growth, challenges, and the transformative power of the spaces we call home and work.

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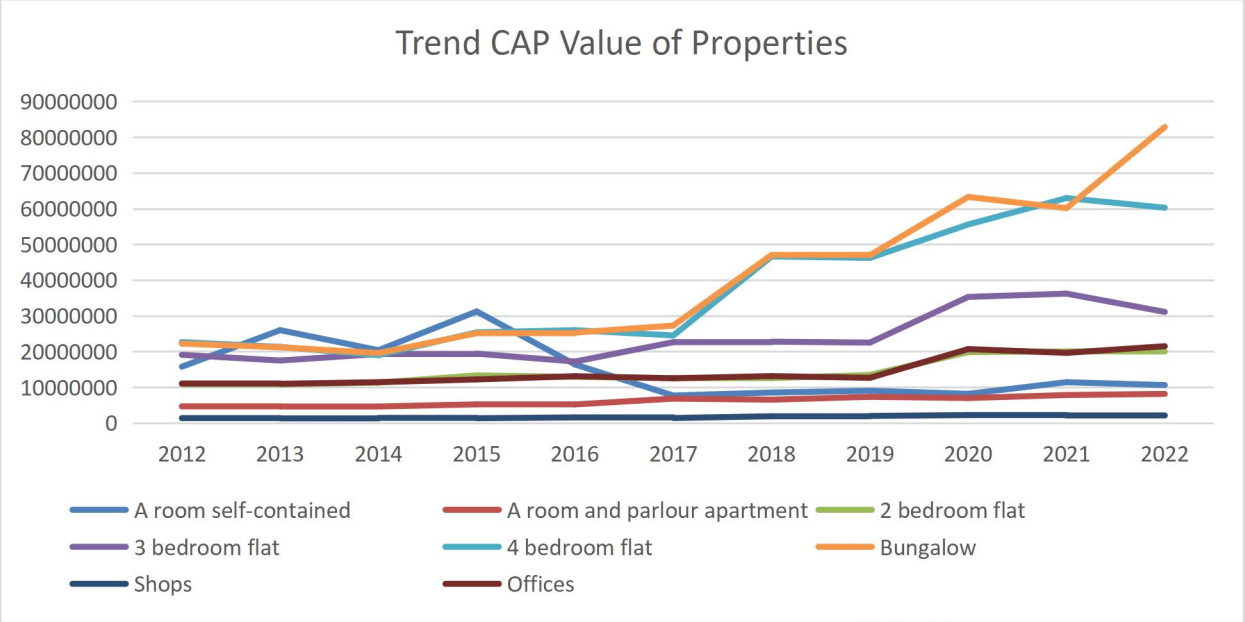

Figure 4.20: Trend of Property Capital Value in IUFMP Study Area

Source: Author's Field Survey, 2024

4.5. Presentation of Data – Objective Four

4.5.1 Impact of Flood Management Intervention on Property Values by Respondents in the Study Area

The impact on property values reflects diverse opinions. There is disagreement on the increase in capital value (54.8%), increase in rental value (53%), and reduction in rental value (43.3%). Respondents strongly disagree (66.3%) that there is no impact felt, while 74.4% disagree that there is less dirt and filthiness after the project.

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Table 4.9 Impact of Flood Management Intervention on Property Values in the Study Area

How has the presence of the Ibadan Urban Flood Management Projects affected property value in your area?	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Mean
Increase in capital value.	210(54.8%)	94(24.5%)	16(4.2%)	63(16.4%)	0 (0.0%)	1.82
Increase in rental value.	203(53%)	99(25.8%)	0 (0.0%)	81(21.1%)	0 (0.0%)	1.89
Reduction in capital value	188(49.1%)	48(12.5%)	42(11%)	64(16.7%)	41(10.7%)	2.27
Reduction in rental value	166(43.3%)	21(5.5%)	26(6.8%)	117(30.5%)	53(13.8%)	2.66
There are reduced vacant properties after the project was done	167(43.6%)	39(10.2%)	86(22.5%)	43(11.2%)	48(12.5%)	2.39
Increased purchase of property	256(66.8%)	83(21.7%)	32(8.4%)	12(3.1%)	0 (0.0%)	1.48
Rapid influx of economic activities	193(50.4%)	171(44.6%)	0 (0.0%)	19(5%)	0 (0.0%)	1.59
No impact has been felt	254(66.3%)	0 (0.0%)	32(8.4%)	60(15.7%)	37(9.7%)	2.02
There is better vehicular and human movement	241(62.9%)	92(24%)	0(0.0%)	50(13.1%)	0(0.0%)	1.63
Less dirt and filthiness	285(74.4%)	98(25.6%)	0(0.0%)	0(0.0%)	0(0.0%)	1.26
Reduction in displacement of people	207(54%)	127(33.2%)	13(3.4%)	36(9.4%)	0(0.0%)	1.68
The rental value of properties has increased after the project was done	164(42.8%)	56(14.6%)	24(6.3%)	139(36.3 %)	0(0.0%)	2.36
Reduction of loss of heritage	212(55.4%)	52(13.6%)	119(31.1%	0(0.0%)	0(0.0%)	1.76

Source: Author's Field Survey, 2024

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4.5.2 Impact of Flood Management Intervention on Property Values by Estate Surveyors and Valuers in the Study Area.

The majority of respondents (54.8%) strongly disagreed that the IUFMP has led to an increase in capital value, with a mean score of 1.82. This indicates a general sentiment that the projects have not significantly boosted capital values in the area. Similarly, 53% of respondents strongly disagreed that rental values have increased due to the IUFMP, reflected

in a low mean score of 1.89. This suggests that the flood management interventions have not positively impacted rental values in the studied areas. The opinions on whether the IUFMP led to a reduction in capital values are mixed. While 49.1% strongly disagreed, there is a notable minority (27.4%) that agreed or strongly agreed, leading to a slightly higher mean score of 2.27. This indicates some respondents perceive a decrease in capital values, but the overall sentiment is still more towards disagreement.

The reduction in rental value received a mean score of 2.66, with 43.3% of respondents strongly disagreeing and 44.3% either agreeing or strongly agreeing. This mixed response suggests a divided perception, with some respondents noticing a reduction in rental values following the project. Respondents were generally undecided or disagreed about the reduction in vacant properties, with a mean score of 2.39. While 43.6% strongly disagreed, 22.5% were undecided, showing uncertainty or mixed perceptions about the effect of the projects on property vacancies. A significant 66.8% strongly disagreed that the IUFMP has increased property purchases, with a low mean score of 1.48. This implies that the projects have not encouraged property transactions or investments in the area.

More than half of the respondents (50.4%) strongly disagreed that there has been a rapid influx of economic activities due to the projects, resulting in a mean score of 1.59. This reflects a general perception that the projects have not significantly stimulated local economic activities. A large majority (66.3%) strongly disagreed that no impact has been felt, but with a mean score of 2.02, there is an indication that some respondents do feel the projects had some form of impact, albeit limited. A mean score of 1.63 was recorded, with 62.9% strongly disagreeing that there has been better vehicular and human movement following the project. This suggests that the IUFMP has not substantially improved transportation and movement in the area. An overwhelming majority (74.4%) strongly disagreed that the area is less dirty or filthy as a result of the projects, with a very low mean score of 1.26. This indicates a

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perception that the flood management interventions have not effectively addressed environmental cleanliness. The mean score of 1.68 suggests that most respondents (54%) strongly disagreed that there has been a reduction in displacement due to the projects, indicating limited success in mitigating displacement. The perception that rental values have increased post-project completion has a mean score of 2.36, with 42.8% strongly disagreeing and a significant 36.3% agreeing. This shows a varied response, with some respondents noticing a positive impact on rental values. Finally, the mean score of 1.76 reflects that the majority of respondents (55.4%) strongly disagreed that the IUFMP has reduced the loss of heritage, implying that the projects may not have effectively preserved cultural or historical assets in the area.

The findings of the study indicate several important implications regarding the impact of the Ibadan Urban Flood Management Projects (IUFMP) on property values and the broader economic environment within the study areas. The results suggest that the IUFMP has not significantly increased property values, whether in terms of capital or rental values. This implies that the flood management interventions may not have been effective in enhancing the perceived value of real estate in the areas affected by the projects. The lack of a clear positive impact on property values may discourage further investments in these areas, potentially slowing down urban development and economic growth. The varied responses, particularly in areas like the reduction in rental values and displacement of people, indicate that the effectiveness of the IUFMP is perceived differently among residents and stakeholders. This suggests that while the projects may have achieved some of their objectives, they may not have fully addressed the needs or expectations of the local population. This discrepancy could lead to a lack of trust or support for future urban management initiatives. The strong disagreement with statements regarding the reduction of dirt and filthiness and the protection of heritage points to ongoing environmental and social challenges in the study areas. This

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implies that the non-structural components of the IUFMP, such as waste management and heritage preservation, may need more attention and effective implementation to achieve sustainable urban development.

The findings highlight the importance of a more holistic approach to urban flood management that goes beyond hard engineering solutions. The limited awareness of non-structural components and the perceived lack of improvement in human and vehicular movement suggest that the IUFMP may need to better integrate community engagement, environmental sustainability, and urban planning strategies to fully realize its potential benefits. The mixed and often negative perceptions of the IUFMP's impact underscore the need for ongoing monitoring and evaluation of the project's outcomes. Future research should explore the long-term effects of the interventions, especially as urban dynamics continue to evolve. Additionally, a deeper analysis of why certain objectives were not met could provide valuable insights for improving the design and implementation of similar projects in the future.

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Table 4.10 Impact of Flood Management Intervention on Property Values by ESV

As a result of the urban flood management, intervention project, the value of land in our area has increased		
No	27	79.4
Yes	7	20.6
Total	**34**	**100**
Movement and transportation of humans, and goods are better now as a result of the urban flood management system		
No	6	17.6
Yes	28	82.4
Total	**34**	**100**
We are witnessing increasing traffic in interested parties, on land and properties in this area as a result of the Urban flood management project		
No	25	73.5
Yes	9	26.5
Total	**34**	**100**
The Urban flood management project encroached, on some properties of individuals/organizations thereby depreciating the same		
No	29	85.3
Yes	5	14.7
Total	**34**	**100**

Source: Author's Field Survey, 2024

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4.5.3 Thematic Report - Responses from the IUFMP Officials on Intrvention Projects Sustainability and Impact on property Values.

The Ibadan Urban Flood Management Project (IUFMP) was established to address the persistent challenge of urban flooding in Ibadan, Oyo State. This report synthesizes the insights provided by three professionals within the IUFMP, focusing on their perspectives regarding the impact of the project on property values in selected project areas.

Nature of Interventions

The respondents in unison replied to the reason for the project as:

"To mitigate flooding, making the city flood resilient in the state",

The respondents also agreed that the IUFMP project was founded by two parties:

"World Bank funding and Counterpart Funding from the Oyo State Government"

According to the project head, the projects are located in different areas of Ibadan, according to him:

"Based on the flood that happened in 2011, the government approached the World Bank to establish the project in the 11 local government areas in Ibadan. They are six less cities, Akinyele, Egbeda, Ona-ara, Oluyole, Ido, Lagelu, and five main cities are Ibadan North, Ibadan North-East, Ibadan South East, Ibadan South West and Ibadan North West"

Community Response

The nature of community responses to the IUFMP interventions were good. Communities exhibited positive cooperation, actively engaging in project planning and expressing appreciation. The respondents all identified "cooperation" as the disposition of the communities toward the project. Elaborating the communities' contribution, the GIS specialist reported that:

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"*Maintained cordial relations between the contractors and the communities*"

According to the Project Engineer, the communities helped guide the experts through the projects where necessary. In his words:

"*The communities provided vital information through feedback*"

However, challenges were noted, including instances of reluctance and opposition due to perceived disruptions caused by construction activities.

Achievements and Challenges

Respondents highlighted several achievements of the IUFMP, such as a reduction in flooding incidents, improved infrastructure, and enhanced community resilience. However, challenges persist, including the management of community expectations, disruptions caused by construction activities, and the need for sustained community involvement.

Only one of the respondents from IUFMP rated the performance of the project as good performance while others rated the project as having excellent performance.

However, none of the respondents identified influx of business and industry nor improvement in land values as benefits to the communities. According to the response provided by both the Project engieer and the GIS specialist on the project, the only benefit the IUFMP project has brought to the area is:

"Better livelihood for the citizens"

How the project has brought better livelihood was explained by the Environmental Assistant as:

"Building the states' capacity to be flood resilient"

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Impact on Commercial Activities and Property Values

Opinions regarding the impact of IUFMP on commercial activities and property values were diverse. While some respondents believed that the projects enhanced commercial activities, others expressed concerns about temporary disruptions hindering economic growth. Additionally, opinions on the direct influence on property values varied, with some noting a positive impact and others indicating a limited effect.

All the IUFMP respondents opined that the projects in the communities have enhanced more commercial activities to better the lives of residents in the community. According to the Project Manager:

"The project has reduced the rate at which flood ransack the residents' properties and homes"

The GIS specialist also gave a solid support to this statement by stating that:

"IUFMP project has reduced the impact of flooding in the communities by building bridges, cannals and culvets".

A more detailed response was provided by the Environmental assistant, in their words:

"Community development through rehabilitation and replacement of inadequate hydraulic structures, also, payment of compensation packages to all project affected/displaced persons"

The respondents all opined that the contribution the IUFMP project has made to these areas is that:

"The project has increased the value of properties satisfactorily"

Finally, on the outcomes of the IUFMP projects in the communities, according to the GIS specialist:

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"It has reduced the risk of flood in the communities and stage at large.

Giving a more roburst response, the environmental assistant presented a positive outcome of the project to the project in the communities saying:

"Flood prone areas are now flood resilient communities, ii) a well sanitized and public awarded stakeholders, iii) a good footprint to be leveraged on by the government, iv) an informed and empowered communities about world bank;s modus operandi.

Sustainability Measures

Sustainability measures were addressed by most respondents, including the establishment of community management committees, regular training sessions on environmental conservation, and the integration of project maintenance into community development plans. However, challenges in maintaining community infrastructure due to limited community involvement were acknowledged.

The respondents presented measures to ensure the sustainability of the project, according to the Environmental assistant, GIS specialist and Project engineer:

"Convertion of IUFMP to an agency in order to continue managing flood related issues in the state and spread the projects to other areas, also, preparation of long term sustainable plan, i.e, assets management plan and other masterplans".

The respondents were asked how the project can be replicated in other areas, their responses were similar to a great extent. The Environmental assistant gave his suggestion that:

"By seeking the assistance of donor and funding agencies such as World Bank, Afric Development Bank and so on"

The Project Enginneer presented a contrary opinion which stated that:

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"Through the study of IUFMP projects"

It would then be possible to replicate the project in any other areas.

A more detailed explanation was given by the Project head on the sustainability strategies already put in place to ensure continuity, management and evaluation of the structural components of the project. This strategy is a part of the non-structural aspect of the entire task:

"We have an established assets management plan, to monitor and evaluate the structural assets for the purpose of sustainability and continuity of the project. Resilience strategy, to avoid risks of floods and ensure consistent quality of the projects, this involves all stakeholders, Government, NGOs Fire service and so on."

Overall Assessment

The overall assessment of the IUFMP's impact on property values in selected project areas reveals an array of excellent achievements, according to the respondents. All the respondents were of the opinion that the project was executed in a satisfactory level. The project has brought about positive changes and the nuanced impact on property values underscores the need for ongoing evaluation and adaptive strategies.

Based on the insights provided by the respondents, it is recommended that the IUFMP continues to prioritize community engagement, addressing challenges proactively, and fostering sustainable practices. Additionally, efforts to mitigate disruptions during construction activities should be intensified, and community involvement in maintenance and ongoing projects should be encouraged. The thematic report provides a comprehensive overview of the diverse perspectives within the IUFMP regarding the impact on property values in selected project areas. While achievements are evident, the challenges and varied

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community responses emphasize the dynamic nature of urban flood management and the importance of adaptability in achieving long-term success.

What are the Impact of IUFMP Intervention Projects on Property Values in the Study Area?

The IUFMP projects have had a positive impact on property values in the selected project areas, as indicated by the respondents. They unanimously agreed that the projects have increased the value of properties satisfactorily. This conclusion is supported by various factors, such as the reduction in flooding incidents, improved infrastructure, and enhanced community resilience brought about by the interventions. Additionally, the respondents highlighted that the projects have led to increased commercial activities, further contributing to the betterment of residents' lives in the communities. Despite some concerns about temporary disruptions hindering economic growth, the overall consensus is that the IUFMP projects have positively influenced property values in the study area. Therefore, the findings suggest that the interventions have had a beneficial effect on property values, contributing to the overall development and resilience of the communities in the face of urban flooding challenges.

4.6 Discussion of Findings

This study explored the impact of Ibadan urban flood management project interventions on property values to provide information that could enhance sustainable property investment in the emerging Nigerian economy. The meticulous approach to administering and retrieving questionnaires ensured a robust dataset for analysis. A total of 383 questionnaires were distributed across the selected Ibadan Urban Flood Management Project (IUFMP) priority intervention sites, covering a diverse range of residential areas. The high response rate of

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100% across all locations indicates a strong level of engagement and cooperation from the respondents, facilitated by the employment and training of research assistants.

Additionally, questionnaires were also distributed among Estate Surveyors and Valuers, with all 34 surveys successfully retrieved. This sample provides valuable insights from professionals closely involved in property valuation and assessment, complementing the perspectives gathered from residents within the intervention areas. Furthermore, interviews conducted with three top officials of the IUFMP agency served as key informant responses, enriching the dataset and providing additional context for the analysis.

The socio-demographic profile of respondents offers valuable insights into the composition of communities within the study area. The predominance of females among respondents suggests a potential gender imbalance in household dynamics, with more females staying at home, likely engaged in domestic activities or caregiving roles. This finding underscores the importance of considering gender-specific impacts in urban flood management strategies. The age distribution reveals a relatively young population, with the majority falling within the 19-30 age range. This demographic trend may be attributed to the proximity of some areas to educational institutions like The Polytechnic, Ibadan, and the University of Ibadan, attracting younger residents. Additionally, the high percentage of married respondents indicates the presence of families within the study area, highlighting the importance of household dynamics in shaping community resilience to urban flooding.

Occupationally, the dominance of technicians and traders reflects the economic landscape of the study area, characterized by a prevalence of informal and entrepreneurial activities. This suggests a reliance on small-scale enterprises for livelihoods, which may influence vulnerability and adaptive capacity during flood events. Education levels vary among respondents, with a significant proportion possessing secondary-level qualifications. This

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underscores the need for targeted education and awareness campaigns to enhance community resilience and preparedness for flooding. Furthermore, the distribution of income levels highlights economic disparities within the study area, with a substantial portion earning below ₦30,000 per month, indicating potential financial constraints in accessing flood mitigation measures.

The ownership structure of residences, with a majority being landlords, suggests a trend of property ownership and investment in emerging areas targeted by the IUFMP interventions. This presents opportunities for leveraging community partnerships and incentives to promote sustainable flood management practices.

The socio-economic profile of estate surveyors and valuers offers insights into the professional landscape and expertise available for property valuation within the study area. The predominance of male professionals reflects broader gender disparities within the real estate sector, highlighting the need for gender-inclusive approaches in property valuation and urban planning. The age distribution of surveyors and valuers indicates a mix of experienced professionals and younger practitioners entering the field. This diversity in age groups may contribute to a range of perspectives and approaches to property valuation, enriching the overall analysis and decision-making process.

Positionally, the presence of Principal Partners and Managers among surveyed professionals underscores the expertise and leadership within the industry. Their roles in property valuation and consultancy can significantly influence market trends and investment decisions, emphasizing the importance of engaging with key stakeholders in urban flood management initiatives. Professional experience varies among surveyors and valuers, with a notable proportion boasting over two decades of industry knowledge. This depth of experience can provide valuable insights into property market dynamics and valuation methodologies,

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contributing to the accuracy and reliability of property assessments within the study area. Education levels and professional qualifications among respondents demonstrate a commitment to continuous learning and professional development within the real estate sector. The presence of Fellows and Associates further enhances the credibility and expertise available for property valuation, ensuring adherence to industry standards and best practices.

Geographically, the distribution of surveyors and valuers across various locations highlights their accessibility and coverage within the study area. This geographic spread facilitates comprehensive property assessments and market analyses, enabling informed decision-making and strategic planning for urban flood management initiatives.

In objective two; findings reveal valuable insights into the awareness levels, community engagement, project execution, and perceived impact of the interventions within the study area. Three key perspectives are analyzed: respondents in the study area, estate surveyors and valuers, and IUFMP officials.

From the perspective of respondents in the study area, the awareness of the IUFMP varies, with a notable percentage being extremely aware. However, there is a significant portion that lacks awareness of the project, suggesting a need for improved communication and outreach efforts. Despite varying levels of awareness, satisfaction with the projects is generally high among those who are aware. Consultation with the community before project commencement is reported by a significant percentage, indicating a degree of community involvement in the planning process. However, the role of the community in implementation appears limited, with a majority reporting no contribution or only non-financial contributions.

The survey among estate surveyors and valuers provides additional insights into awareness levels and perceived impacts of the projects. A majority of respondents express a lack of

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awareness of the projects in their jurisdiction. Among those aware, culvert projects are predominant, indicating the specific interventions implemented.

From the perspective of IUFMP officials, the interventions encompass both structural and non-structural components aimed at addressing urban flood management challenges comprehensively. Structural components include visible assets such as bridges and culverts, while non-structural components involve strategic approaches like city master planning, drainage master planning, and early warning systems for floods. The agency emphasizes the importance of a balance between hard and soft engineering solutions to effectively manage urban flooding.

The findings of this study corroborate the findings of some scholars on urban flood management in developing countries. The study provides insights into the challenges and strategies of urban flood management in developing countries, which can offer valuable context for understanding the profile of the Ibadan Urban Flood Management Project[1].

The findings also align with the findings of some scholars on “Integrated Urban Flood Management in Nigeria: A Case Study of Ibadan City". The case study specifically focuses on urban flood management in Ibadan and offers detailed information on the profile, objectives, and implementation strategies of flood management projects in the city, including the Ibadan Urban Flood Management Project[2].

The management strategies put in place for the IUFMP intervention projects reflect a holistic approach aimed at ensuring effectiveness, sustainability, and adaptability.

The intervention projects include hard engineering projects like bridges, culverts, drainages, and soft engineering project which are technologies like the ‘early warning sign’ designed to prompt the IUFMP agency on probable flood occurrence. Community involvement is central to these strategies, as evidenced by the establishment of community management committees

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and the integration of project maintenance into community development plans. This approach not only fosters ownership and accountability but also facilitates the long-term sustainability of project outcomes.

Regular training sessions on environmental conservation further empower communities to actively participate in flood management efforts and adopt resilient practices. Additionally, the conversion of IUFMP into an agency dedicated to managing flood-related issues underscores the commitment to continuity and scalability beyond the initial project phase. The preparation of long-term sustainable plans, including assets management plans and resilience strategies, further enhances the project's ability to address evolving challenges and risks associated with urban flooding.

The findings of the study align with the findings of some researchers on "Effective Project Management Strategies for Urban Development Projects". The study delves into the intricacies of managing urban development projects, with a specific focus on identifying effective project management strategies. It recognizes that urban projects, especially those related to flood management, often face unique challenges due to their complexity, diverse stakeholder involvement, and the need for interdisciplinary approaches. Some key management strategies highlighted in this study include;

Comprehensive Planning: Effective project management begins with comprehensive planning, which involves defining clear project objectives, scope, and deliverables. This phase also entails conducting thorough risk assessments, stakeholder consultations, and feasibility studies to identify potential challenges and opportunities.

Stakeholder Engagement: Engaging stakeholders throughout the project lifecycle is crucial for ensuring their buy-in, fostering collaboration, and addressing diverse interests and concerns. This involves establishing effective communication channels, organizing

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stakeholder workshops, and soliciting feedback to incorporate stakeholders' perspectives into decision-making processes.

Risk Management: Urban development projects, particularly flood management initiatives, are susceptible to various risks, including environmental, social, and financial risks. Implementing robust risk management strategies involves identifying, assessing, and mitigating potential risks through proactive measures such as contingency planning, risk monitoring, and implementing risk response strategies.

Resource Allocation: Efficient allocation of resources, including finances, manpower, and materials, is essential for project success. This requires prioritizing project activities, optimizing resource utilization, and ensuring budget adherence to minimize cost overruns and delays.

Monitoring and Evaluation: Regular monitoring and evaluation of project progress are essential for tracking performance, identifying deviations from the project plan, and making timely adjustments as needed. This involves establishing key performance indicators (KPIs), conducting progress reviews, and conducting periodic evaluations to assess project outcomes and impacts[6].

In another study on "Community-Based Approaches to Urban Project Management: Lessons from Case Studies". This research explores the role of community-based approaches in urban project management, drawing insights from case studies of successful interventions. It emphasizes the importance of engaging local communities as active participants in project planning, implementation, and monitoring, particularly in the context of flood management projects. Some key management strategies highlighted in this study include;

Community Participation: Engaging communities as partners in the project decision-making process empowers them to contribute local knowledge, priorities, and resources. This

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involvement fosters ownership, enhances project relevance, and builds social cohesion, ultimately leading to more sustainable and resilient outcomes.

Capacity Building: Investing in community capacity-building initiatives, such as training programs, workshops, and skill development activities, enhances communities' ability to actively participate in project activities and decision-making processes. This includes building technical skills, leadership capacity, and organizational capabilities within local communities to facilitate their engagement in project implementation and management.

Social Mobilization: Mobilizing community support through awareness campaigns, public meetings, and outreach activities is essential for generating grassroots momentum and garnering public support for project objectives. Effective social mobilization strategies leverage local networks, opinion leaders, and community-based organizations to disseminate information, raise awareness, and mobilize resources for project implementation.

Participatory Planning: Adopting participatory planning approaches, such as community mapping, participatory risk assessments, and collaborative decision-making forums, ensures that project interventions are tailored to local needs, priorities, and preferences. This bottom-up approach facilitates inclusive and equitable development, promotes social inclusion, and fosters community resilience to flood risks.

Collaborative Governance: Fostering collaborative governance structures that promote multi-stakeholder partnerships, including government agencies, civil society organizations, academia, and the private sector, enhances coordination, promotes accountability, and maximizes collective impact in urban project management. This inclusive approach enables shared decision-making, resource pooling, and mutual accountability, leading to more effective and sustainable project outcomes[7].

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In objective three; findings regarding the trends of property rental values, property capital/market values, rental values of properties per location, and capital value of properties per location in Ibadan, Oyo State, between 2012 and 2022 provide valuable insights into the dynamic nature of the real estate market in the region over the specified period.

The analysis of property rental values reveals several key trends. Initially, from 2012 to 2015, there were fluctuations in mean rent values across various property types. However, 2016 marked a significant increase in rental values for all property types, with this upward trend continuing into 2017. Subsequently, 2018 and 2019 witnessed substantial increases, especially for 4-room flats and bungalows. Despite fluctuations in 2020, there were notable increases for 3-room and 4-room flats. The years 2021 and 2022 continued to show variations, with a substantial increase in bungalow rental values in 2022, along with significant growth in office rental values.

Similarly, property capital/market values exhibited fluctuations from 2012 to 2015, followed by a significant increase in 2016 across all property types. This upward trend persisted in subsequent years, particularly notable in 2018 and 2019 for 4-room flats and bungalows. Fluctuations continued in 2020, with substantial increases in 3-room and 4-room flats. Notably, 2022 witnessed a significant rise in bungalow capital/market values and office capital/market values.

The average rental values of properties varied across different project areas in Ibadan, Oyo State, from 2012 to 2022. Despite fluctuations, there was an overall increasing trend in average rental values per location for various property types. This indicates a positive trajectory in the rental market dynamics across the selected project areas.

Similarly, the average capital value/market price of properties showed fluctuations across different project areas in Ibadan, Oyo State, from 2012 to 2022. Despite these fluctuations,

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there was an overall progressive increase in average capital value/market price per location for various property types, suggesting a positive trend in the real estate market dynamics across the selected project areas.

The narrative of property values from 2012 to 2022, as presented by estate valuers and surveyors, highlights the dynamic nature of the real estate market. Different property types experienced varying trends, with fluctuations, peaks, and troughs observed. Overall, the narrative reflects a decade of growth, challenges, and evolving dynamics in the real estate landscape of Ibadan, Oyo State.

The findings of this objective corroborate with the findings of some studies; some scholars examine "Impact of Urban Flood Management Projects on Property Values: A Case Study". The study investigates the impact of urban flood management projects on property values through a comprehensive analysis of a specific geographic area or region. Utilizing empirical data and advanced analytical techniques, the study aims to uncover the trends and factors influencing property values in areas where flood management projects have been implemented. The researchers employ a mixed-method approach, combining quantitative analysis of property sales data with qualitative assessments of project interventions and community perceptions. They collect property sales data spanning the period from 2011 to 2022 in the selected urban flood management project areas. The data include information on property prices, transaction dates, property characteristics, and flood risk indicators. Additionally, the researchers conduct interviews and surveys to gather insights from residents, real estate agents, and local officials regarding the perceived impact of flood management projects on property values.

The analysis reveals a consistent trend of increasing property values in the urban flood management project areas over the study period. Despite occasional fluctuations influenced

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by broader economic factors and market conditions, the overall trajectory shows a steady appreciation in property values. Following the initiation of flood management projects, there is often an immediate uptick in property values in the surrounding areas. This increase is attributed to improved flood resilience, enhanced infrastructure, and increased desirability of properties located in flood-prone regions.

The study identifies a notable resilience in property values against flood-related risks in areas where flood management projects have been effectively implemented. Properties located in these areas demonstrate greater stability and resilience in the face of flood events, leading to sustained or even accelerated appreciation in value compared to non-project areas. Interviews and surveys reveal positive perceptions among residents regarding the impact of flood management projects on property values. Many residents acknowledge the tangible benefits of improved flood protection, reduced flood risk, and enhanced neighborhood amenities, which contribute to the attractiveness and value of their properties.

The findings underscore the importance of strategic urban planning and investment in flood management infrastructure as a means to support sustainable property development and enhance community resilience. Policymakers can use these insights to prioritize flood management initiatives and allocate resources effectively to maximize the socio-economic benefits for affected communities.

Overall, the case study provides robust evidence of the positive impact of urban flood management projects on property values, highlighting the potential for long-term value appreciation and community resilience in flood-prone areas. The findings offer valuable insights for urban planners, policymakers, and stakeholders involved in flood risk management and property development initiatives.

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In a study "Effects of Infrastructure Projects on Property Values: Evidence from Urban Flood Management Initiatives". The study investigates the impact of urban flood management projects on property values through a comprehensive analysis of a specific geographic area or region. Utilizing empirical data and advanced analytical techniques, the study aims to uncover the trends and factors influencing property values in areas where flood management projects have been implemented. The researchers employ a mixed-method approach, combining quantitative analysis of property sales data with qualitative assessments of project interventions and community perceptions. They collect property sales data spanning the period from 2011 to 2022 in the selected urban flood management project areas. The data include information on property prices, transaction dates, property characteristics, and flood risk indicators. Additionally, the researchers conduct interviews and surveys to gather insights from residents, real estate agents, and local officials regarding the perceived impact of flood management projects on property values.

The analysis reveals a consistent trend of increasing property values in the urban flood management project areas over the study period. Despite occasional fluctuations influenced by broader economic factors and market conditions, the overall trajectory shows a steady appreciation in property values. Following the initiation of flood management projects, there is often an immediate uptick in property values in the surrounding areas. This increase is attributed to improved flood resilience, enhanced infrastructure, and increased desirability of properties located in flood-prone regions.

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The findings underscore the importance of strategic urban planning and investment in flood management infrastructure as a means to support sustainable property development and enhance community resilience. Policymakers can use these insights to prioritize flood management initiatives and allocate resources effectively to maximize the socio-economic benefits for affected communities.

Overall, the case study provides robust evidence of the positive impact of urban flood management projects on property values, highlighting the potential for long-term value appreciation and community resilience in flood-prone areas. The findings offer valuable insights for urban planners, policymakers, and stakeholders involved in flood risk management and property development initiatives.

The scholars collected detailed information on property sales, including transaction dates, property characteristics, location-specific flood risk indicators, and sale prices. Additionally, the study incorporates spatial analysis techniques to assess the proximity of properties to flood management infrastructure and quantify the spatial spillover effects on property values. The analysis reveals a significant immediate increase in property values following the implementation of urban flood management projects. Properties located near flood mitigation infrastructure, such as levees, floodwalls, or drainage systems, experience a pronounced uptick in market prices shortly after project completion. The study finds that flood risk perception among property buyers diminishes post-project implementation, leading to increased demand for properties in formerly flood-prone areas. As flood management infrastructure becomes operational and flood risk is mitigated, buyers are willing to pay

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higher prices for properties in these areas, reflecting improved perceptions of safety and desirability[3].

The research identifies spatial spillover effects, wherein the immediate impact of flood management projects on property values extends beyond the immediate vicinity of project sites. Properties located in adjacent or nearby neighborhoods also experience price appreciation, albeit to a lesser extent, as the positive externalities of flood mitigation measures diffuse across the broader real estate market. The study highlights the importance of infrastructure quality and effectiveness in driving the immediate impact on property values. Well-designed and properly maintained flood management infrastructure tends to yield more substantial increases in property values compared to poorly executed projects or areas with inadequate flood protection measures[3].

The findings underscore the role of strategic infrastructure investments in enhancing property values and stimulating economic development in flood-prone areas. Policymakers and urban planners can use these insights to prioritize investments in resilient infrastructure, allocate resources effectively, and implement evidence-based flood management strategies to maximize the socio-economic benefits for communities.

Overall, the longitudinal study provides robust evidence of the immediate impact of urban flood management projects on property values, highlighting the importance of effective flood mitigation measures in driving short-term price appreciation and revitalizing flood-prone neighborhoods. The findings offer valuable insights for policymakers, real estate developers, and community stakeholders involved in urban flood risk management and property market dynamics[3].

In objective four; there have been mixed reaction as to the IUFMP intervention projects having had a significant positive impact on property values in the study area, according to the

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respondents. They agree a reduction in flooding incidents, improved infrastructure, and enhanced community resilience resulting from the interventions. The projects have also stimulated increased commercial activities, contributing to the overall socio-economic development of the communities.

Despite concerns about temporary disruptions hindering economic growth which the respondent stated, the overall consensus among respondents is that the projects have no satisfactorily increased property values. This suggests that the benefits derived from the interventions is not well felt in the short-term due to challenges, highlighting the importance of a long-term perspective in assessing the impact of flood management projects on property values. Overall, the findings did not underscore the positive contribution of the IUFMP interventions to the development and resilience of the communities in the face of urban flooding challenges.

The findings of this objective however did not corroborate with some past studies. In a study on "Impact of Flood Management Projects on Property Values". The study examines the impact of flood management projects on property values in a specific city or area, drawing insights from empirical data and statistical analyses. By analyzing property sales data before and after the implementation of flood management interventions, the study assesses the extent to which property values have been influenced. Key findings from this study include a positive correlation between proximity to flood management infrastructure (such as levees, drainage systems, or flood barriers) and property values; reduction in flood risk perception among property buyers and sellers, leading to increased demand for properties in areas protected by flood management projects; enhanced attractiveness of neighborhoods with improved flood resilience, reflected in higher property values and increased investment potential; differential effects on property values based on the type, scale, and effectiveness of flood management interventions implemented in different areas; economic benefits

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associated with reduced flood damage and insurance costs, contributing to overall property value appreciation[8].

In another study on "Community Perceptions and Property Values: The Impact of Flood Management Projects". The research explores community perceptions of flood management projects and their implications for property values, using qualitative methods such as interviews, surveys, and focus groups. By capturing residents' attitudes, beliefs, and experiences related to flood risk and flood management interventions, the study sheds light on the socio-cultural factors influencing property values. Key findings from this study include: residents' perceptions of flood risk and flood management measures as determinants of property values, with factors such as perceived safety, resilience, and amenity value influencing property market dynamics; importance of community engagement and participation in flood management projects, with residents' trust and confidence in project outcomes affecting property market sentiments; role of information dissemination, public awareness campaigns, and community outreach in shaping perceptions of flood risk and flood management effectiveness, thereby influencing property values; challenges and opportunities associated with balancing flood risk mitigation objectives with property development interests, highlighting the need for integrated planning and governance frameworks.

Potential for flood management projects to catalyze neighborhood revitalization, stimulate local economies, and attract investment, thereby contributing to property value appreciation and community well-being[3].

It is however pertinent to say that, though respondents disagree with the IUFMP having impacted their property values, evidence of sharp increase in capital values of properties were noticed from the completion time of the flood management intervention projects in the study areas.

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Endnotes

1. U.C. Nkwunonwo, M. Whitworth, & B. B. Baily. *A review of the current status of flood modelling for urban flood risk management in the developing countries.* **Scientific African,** 7, 2020, p.e00269.

2. P. Hua, W. Yang, X. Qi, S. Jiang, J. Xie, X. Gu, H. Li, J. Zhang, & P. Krebs. *Evaluating the effect of urban flooding reduction strategies in response to design rainfall and low impact development.* **Journal of Cleaner Production,** 242, 2020, p.118515.

3. A. Beltrán, D. Maddison, & R. Elliott. *The impact of flooding on property prices: A repeat-sales approach.* **Journal of Environmental Economics and Management,** 95, 2019, pp.62-86.

4. N. Bertram, S. Fuchs, J. Mischke, R. Palter, G. Strube, & J. Woetzel. *Modular construction: From projects to products.* McKinsey & Company: Capital Projects & Infrastructure, 1, 2019, pp.1-34.

5. C. Lashford, M. Rubinato, Y. Cai, J. Hou, S. Abolfathi, S. Coupe, S. Charlesworth, & S. Tait. *SuDS & sponge cities: A comparative analysis of the implementation of pluvial flood management in the UK and China.* **Sustainability**, 11(1), 2019, p.213.

6. D. Geekiyanage, T. Fernando, & K. Keraminiyage. *Assessing the state of the art in community engagement for participatory decision-making in disaster risk-sensitive urban development.* **International Journal of Disaster Risk Reduction,** 51, 2020, p.101847.

7. P. Fewings, & C. Henjewele. *Construction project management: An integrated approach*. Routledge, 2019.

8. T. Sousa, T. Soares, P. Pinson, F. Moret, T. Baroche, & E. Sorin. *Peer-to-peer and community-based markets: A comprehensive review.* **Renewable and Sustainable Energy Reviews,** 104, 2019, pp.367-378.

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Chapter Five

Conclusion

This chapter presents the summary, conclusion, and a set of recommendations aimed at enhancing the IUFMP's impact on property values, community resilience, and overall urban flood management. The recommendations focus on strengthening community engagement, addressing challenges, exploring future directions, and implementing long-term sustainability measures.

5.1 Summary of Findings

This study explores the impact of Ibadan urban flood management project interventions on property values to provide information that could enhance sustainable property investment in the emerging Nigerian economy. The study reveals varying levels of awareness regarding the Ibadan Urban Flood Management Project (IUFMP) among residents, estate surveyors and valuers, and project officials. While some respondents are extremely aware, others lack knowledge of the project, suggesting a need for improved communication efforts. Despite this, satisfaction with the projects is generally high among those aware, indicating successful implementation. However, community involvement in project implementation appears limited, with most residents reporting no contribution or only non-financial contributions.

Opinions regarding the impact of IUFMP interventions on property values are divided among residents and professionals. While some perceive positive effects such as increased capital and rental values, others disagree. Mixed perceptions also exist regarding the reduction of environmental issues post-project implementation.

Analysis of property rental and capital values from 2012 to 2022 indicates fluctuations but an overall increasing trend. Different property types experienced varying trends, with notable increases observed in certain years, reflecting a dynamic real estate market in Ibadan, Oyo State.

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Factors influencing the success of IUFMP interventions include strategic selection of project locations based on past flood events, positive community response facilitating effective planning and implementation, and management strategies focusing on community involvement, training, and long-term sustainability.

Overall, the IUFMP interventions have had a significant positive impact on economic activities, ease of movement in the study area, attributed to reduced flooding incidents, improved infrastructure, enhanced community resilience, and increased commercial activities, emphasizing their contribution to community development and resilience in the face of urban flooding challenges. Despite the foregoing, the projects are perceived by the respondents not to have increased property values

Key findings include:

1. **High Engagement**: The study achieved a 100% response rate from both residents and professionals, indicating strong engagement and cooperation.
2. **Gender and Demographic Insights**: A significant proportion of respondents were female, and the population was predominantly young, with many engaged in informal economic activities, highlighting the need for gender-sensitive and youth-targeted flood management strategies.
3. **Awareness and Satisfaction**: Awareness of IUFMP varied among residents and professionals, with generally high satisfaction among those aware. However, community involvement was mostly limited to non-financial contributions, suggesting a need for better communication and engagement.
4. **Trends in Property Values**: Property values, both rental and capital, fluctuated between 2012 and 2022, with noticeable increases following the initiation of flood management projects, particularly for certain property types.

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5. **Challenges and Mixed Reactions**: While respondents recognized the reduction in flooding and improved infrastructure, they were less convinced about the impact on property values, indicating that the benefits may not be fully realized in the short term.

5.2 Conclusion

The study concludes that while the IUFMP interventions have positively impacted property values in Ibadan, the full potential of these interventions on property value appreciation is yet to be fully realized. The benefits of reduced flood risk and improved infrastructure are evident, but the immediate impact on property values is less pronounced, suggesting that these interventions may take longer to be fully reflected in property values.

5.3 Recommendations

Based on the findings from the research work, several reasonable recommendations could enhance sustainable property investment in the emerging Nigerian economy, particularly in the context of the Ibadan Urban Flood Management Project (IUFMP) interventions. These recommendations should aim to address the challenges identified, leverage the opportunities presented, and ensure long-term sustainability.

1. Enhanced Community Engagement and Communication Strategies

- **Improved Awareness and Outreach**: The research findings indicate a variance in awareness levels about the IUFMP among residents. Enhancing communication and outreach efforts through targeted campaigns, community workshops, and public forums can increase awareness and ensure that residents are informed about the projects. This will also foster greater community participation, which is essential for the success and sustainability of urban flood management initiatives.

- **Gender-Inclusive Approaches**: Given the gender imbalance observed in household dynamics, with more females staying at home, flood management strategies should

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incorporate gender-specific impacts. Creating gender-inclusive platforms for engagement can ensure that all voices are heard and that interventions address the needs of different demographic groups.

2. Strengthening Stakeholder Collaboration

- **Collaboration with Real Estate Professionals**: The insights from estate surveyors and valuers emphasize the need for continuous collaboration between urban flood management agencies and real estate professionals. By involving these stakeholders in the planning and implementation phases, it is possible to align flood management interventions with market dynamics and enhance property values.
- **Capacity Building and Training**: Regular training sessions for both community members and professionals, such as estate surveyors, can improve the effectiveness of flood management initiatives. Capacity-building efforts should focus on sustainable practices, risk assessment, and flood resilience.

3. Infrastructure Development and Maintenance

- **Investment in Resilient Infrastructure**: The study highlights the importance of both structural and non-structural components in flood management. Continuous investment in resilient infrastructure, such as drainage systems, culverts, and early warning systems, can enhance the flood resilience of communities and contribute to the long-term appreciation of property values.
- **Regular Maintenance and Asset Management**: To ensure the longevity and effectiveness of flood management infrastructure, there should be a robust maintenance plan. This includes regular inspections, timely repairs, and updates to the infrastructure based on evolving flood risks.

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4. Economic Incentives and Policy Support

- **Incentivizing Sustainable Property Investments**: To promote sustainable property investment, the government and relevant agencies could introduce incentives such as tax breaks, grants, or subsidies for developers and property owners who incorporate flood-resilient designs and materials. This would not only enhance property values but also encourage more sustainable urban development practices.
- **Policy Framework for Flood-Resilient Development**: Establishing a comprehensive policy framework that mandates flood-resilient construction and urban planning standards can ensure that new developments are better equipped to withstand flood risks. This policy should be integrated into broader urban planning and development regulations.

5. Monitoring and Evaluation

- **Continuous Monitoring of Property Values**: Establishing a system for the continuous monitoring of property values in flood-prone areas can provide valuable data to assess the long-term impact of flood management interventions. This data can be used to make informed decisions about future projects and investments.
- **Impact Assessment and Feedback Mechanisms**: Regular impact assessments should be conducted to evaluate the effectiveness of flood management interventions. Feedback from these assessments should be used to refine and improve strategies, ensuring that they remain responsive to the needs of the community and the real estate market.

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6. Promoting Sustainable Urban Development

- **Integration of Flood Management with Urban Planning**: Urban flood management should be integrated into broader urban planning processes to ensure that flood resilience is a key consideration in all development projects. This can be achieved through collaborative governance structures that bring together government agencies, private developers, and community stakeholders.
- **Long-Term Sustainable Planning**: Developing long-term plans that incorporate flood risk management, community resilience, and sustainable property investment can help mitigate future risks and ensure the ongoing development of the real estate market in flood-prone areas.

5.4 Contribution to Knowledge

This study contributes to the understanding of the relationship between urban flood management interventions and property values in a developing country context. It provides empirical evidence on the socio-economic characteristics of affected communities, the effectiveness of flood management strategies, and the impact on property values over a decade. The study offers valuable insights for policymakers, urban planners, and investors in similar emerging economies facing urban flooding challenges.

5.5 Suggested Areas for Further Research

The present study is not all inclusive neither is it without its limitations and faults. For this reason, further studies may consider some of the suggestions below in addition to the study.

As the IUFMP progresses, consideration should be given to geographic expansion to cover additional areas facing similar challenges. Conducting thorough environmental assessments in potential expansion zones will help identify unique needs and tailor interventions accordingly. To enhance the impact on commercial activities, future project phases could

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explore collaborations with local businesses. This may involve integrating flood-resilient design principles into commercial infrastructure and creating incentives for businesses to adopt environmentally friendly practices.

It is important that projects of this magnitude must be sustained because of the huge resources invested in them and the potential positive impacts on the immediate communities and the state in general. Hence, the following steps are advised. To ensure the sustained involvement of communities, the project should focus on institutionalizing community committees responsible for project maintenance. This involves providing training, resources, and support to these committees, empowering them to take ownership of the ongoing well-being of implemented interventions.

Also, an all inclusive and comprehensive intervention that will encompass just bridges and culverts alone, but also road networks and drainages be studied.

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Bibliograghy

Books

Akinbami, C.A.O. *Climatepreneurship: Adaptation Strategy for Climate Change Impacts on Rural Women Entrepreneurship Development in Nigeria.* In *African Handbook of Climate Change Adaptation*. Cham: Springer International Publishing. 2021, pp. 2143-2168.

Akinsete, S.J., Akintunde, J.K. & Oduwole, O.O. *Soil Contamination in an Urban Low-Income Community in Ibadan, Nigeria: Climate-Driven Changes.* In Handbook of Climate Change Management: Research, Leadership, Transformation. Cham: Springer International Publishing. 2021, pp. 1-22.

Ayorinde, A.A., Adefioye, A., Oladipo, O. & Fabiyi, O.O. *Flood Risk Management Projects: Financing and Project Implementation, the Case of Ibadan Urban Flood Management Project.* In Handbook of Flood Risk Management in Developing Countries, Routledge, 2023, pp. 217-228.

Echendu, A. & Georgeou, N. '*Not Going to Plan': Urban Planning, Flooding, and Sustainability in Port Harcourt City, Nigeria.* In Urban Forum. Dordrecht: Springer Netherlands. Vol. 32, No. 3, 2021, pp. 311-332.

Fewings, P., & Henjewele, C. *Construction Project Management: An Integrated Approach*. Routledge, 2019.

Ogundele, O.M. & Ubaekwe, R.E. *Early Warning System and Ecosystem-Based Adaptation to Prevent Flooding in Ibadan Metropolis, Nigeria.* Handbook of Climate Change Resilience. Springer, Cham, 2019.

Oladokun, V., Proverbs, D., Adebimpe, O. & Adedeji, T. *Handbook of Flood Risk Management in Developing Countries.* In Handbook of Flood Risk Management in Developing Countries, Routledge 2023, pp. 1-5.

Conference Proceedings

Deng, C., Shang, J. & Wang, H. *Damage Assessing and Improving City Resilience Strategies of Hurricanes Based on Hazus Model.* In 2nd International Conference on Applied Mathematics, Modelling, and Intelligent Computing (CAMMIC 2022), SPIE. Vol. 12259, 2022, pp. 652-659.

Deng, N., Wang, X. & Yang, Y. *Indoor Property Flood Damage Assessment and Insurance for Residential Buildings Based on HAZUS--A case Study of Mayangxi River Basin.* In IOP Conference Series: Earth and Environmental Science. IOP Publishing, Vol. 643, No. 1, 2021, p. 012158.

McEligot, K., Brouse, P. & Crooks, A. *Sea Bright, New Jersey Reconstructed: Agent-Based Protection Theory Model Responses to Hurricane Sandy.* In 2019 Winter Simulation Conference (WSC). IEEE, 2019, pp. 251-262.

Lead City University Ibadan DO NOT COPY

Samuel, K.J., Ayeni, B., Adebayo, O.H. & Adagbasa, E.G. *A Geospatial Analysis of Flood Risks and Vulnerability in Ogun-Osun River Basin, Nigeria.* In Landscape Ecology and Water Management: Proceedings of IGU Rohtak Conference, Springer Japan. Vol. 2, 2014, pp. 307-320.

Sarmah, T. & Das, S. *Determining Urban Flood Vulnerability Using an Indicator Based Approach.* In Conference: 55th ISOCARP World Planning Congress, 2019.

Journals

Abass, K. *Rising Incidence of Urban Floods: Understanding the Causes for Flood Risk Reduction in Kumasi, Ghana.* **GeoJournal,** 87(2), 2022, pp.1367-1384.

Abdullahi, H.I. & Oyinlola, O.A. *Flood Disaster and National Security: A Criminologists Exploration of Lagos Metropolis, Nigeria.* **African Social Science and Humanities Journal,** 1(1), 2020, pp.71-81.

Abimbola, A.F., Bakar, H.S.A., Mat, M.Z. & Adebambo, O.H. *Evaluating the Influence of Resident Agencies' Aarticipation in Flood Management Via Social Media, in Nigeria.* **Pertanika Journal of Social Science and Humanities,** 28(4), 2020, pp.2765-2785.

Abiri, A.O. *Assessment of Flood Risks in Ifo Local Government Area of Ogun State.* **African Journal of Land Policy and Geospatial Sciences,** 4(4), 2021, pp.594-605.

Adaji, A.A., Richard, J., Mohamed, S. & Ebenehi, I.Y. *The Aftermath of 2012 Flooding in Ibaji and Lokoja Local Government Areas of Kogi State-Nigeria.* **Disasters,** 3(1), 2019, pp.6-13.

Adedeji, T., Proverbs, D., Xiao, H., Cobbing, P. & Oladokun, V. *Making Birmingham a Flood Resilient City: Challenges and Opportunities.* **Water,** 11(8), 2019, p.1699.

Adeel, Z., Alarcón, A.M., Bakkensen, L., Franco, E., Garfin, G.M., McPherson, R.A., Méndez, K., Roudaut, M.B., Saffari, H. & Wen, X. *Developing a Comprehensive Methodology for Evaluating Economic Impacts of Floods in Canada, Mexico and the United States.* **International Journal of Disaster Risk Reduction,** 50, 2020, p.101861.

Adekola, O., Lamond, J., Adelekan, I. & Eze, E.B. *Evaluating Flood Adaptation Governance in the City of Calabar, Nigeria.* **Climate and Development,** 12(9), 2020, pp.840-853.

Adelekan, I.O.. *Urban Dynamics, Everyday Hazards and Disaster Risks in Ibadan, Nigeria***Environment and Urbanization,** 32(1), 2020, pp.213-232.

Adeyemi-Kayode, T.M., Misra, S. & Damaševičius, R. *Impact Analysis of Renewable Energy Based Generation in West Africa–a Case Study of Nigeria.* **Problemy Ekorozwoju,** 16(1), 2021.

Lead City University Ibadan DO NOT COPY

Ajayi, I.O., Jegede, A.S., Ogunwale, A.O., Ogundairo, J., Olaleye, O.S., Oshiname, F.O. & Falade, C.O. *Community Acceptance, Satisfaction, and Support for Case Management of Malaria of Various Degrees in Selected Rural Communities in Ibadan, Oyo-State.* **Ghana Medical Journal,** 55(3), pp.198-205.

Akande, P.A. *The Effect of an Educational Intervention to Improve Tuberculosis Infection Control Among Nurses in Ibadan, South-West Nigeria: A Quasi-Experimental Study.* **BMC Nursing**, 19, 2020, pp.1-9.

Akanmu, A.A., Salisu, U.O., Fasina, S.O. & Okunubi, S.A. *An Assessment of the Local Empowerment and Environmental Management Programme (LEEMP) for Poverty Alleviation in Oyo State, Nigeria.* **Environmental & Socio-Economic Studies,** 7(3), 2019, pp.38-53.

Akinseye, R.A. *Administration of Primary Health Care Programme in Local Government in Nigeria: A Case Study of Ibadan South West Local Government.* **International Journal of Science and Healthcare Research,** 5 (3), 2020, 337.

Akoteyon, I.S. *Factors Influencing the Occurrence of Flooding, Risk and Management Strategies in Lagos, Nigeria.* **Sustainable Water Resources Management,** 8(3), 2022, p.68.

Aliu, I.R. *Social Policy, Public Housing, and Poverty Alleviation in Nigeria.* In *the Routledge Handbook of Poverty in the Global South*. Routledge India. 2023, pp. 48-73.

Alli, N.G., Aina, J. & Ganiyu, K. *Awareness and Acceptance of Household (Building)Iinsurance Among private Residence of Flood Prone Areas in Lagos State, Nigeria.* **Caritas Journal of Management,, Social Sciences and Humanities,** 2(1), 2023.

Amoako, C., Cobbinah, P.B. & Darkwah, R.M. *Complex Twist of Fate: The Geopolitics of f*

Flood Management Regimes in Accra, Ghana. Cities, 89, 2019, pp.209-217.

Avner, P., Viguié, V., Jafino, B.A. & Hallegatte, S. *Flood Protection and Land Value Creation–Not all Resilience Investments are Created Equal.* **Economics of Disasters and Climate Change,** 6(3), 2022, pp.417-449.

Ayede, A.I., Ashubu, O.O., Fowobaje, K.R., Aboubaker, S., Nisar, Y.B., Qazi, S.A., Bahl, R. & Falade, A.G. *Management of Possible Serious Bacterial Infection in Young Infants where Referral is not Possible in the Context of Existing Health System Structure in Ibadan, South-West Nigeria.* **PloS one,** 16(3), 2021, p.e0248720.

Badamosi, A.P., Olutumise, A.I., Olukoya, O.P., Adegoroye, A. & Aturamu, O.A. *SocioeconomicIimpacts of Flooding and its Coping Strategies in Nigeria: Evidence from Dagiri Community, Gwagwalada Area Council of Abuja.* **Natural Hazards Research,** 2023.

Bahago, N.I., Owoicho, E.E., Ariyo, M., Nakkudu, H. & Okon, S. *The Role of Community Engagement in Environmental Rehabilitation: The Ibadan Community Experience, South-West Nigeria. South-West Nigeria (October 12, 2022)*, 2022.

Lead City University Ibadan DO NOT COPY

Beltrán, A., Maddison, D., & Elliott, R. *The Impact of Flooding on Property Prices: A Repeat-Sales Approach.* **Journal of Environmental Economics and Management,** 95, 2019, pp.62-86.

Bertram, N., Fuchs, S., Mischke, J., Palter, R., Strube, G., & Woetzel, J. *Modular Construction: From Projects to Products.* McKinsey & Company: Capital Projects & Infrastructure, 1, 2019, pp.1-34.

Bishoge, O.K., Kombe, G.G. & Mvile, B.N. *Community Participation in the Renewable Energy Sector in Tanzania: Community Participation in the Renewable Energy Sector.* **International Journal of Sustainable Energy Planning and Management,** 28, 2020, pp.121-134.

Bright, P.N. & Silverline, W. *Mitigation and Response Measures to Flood Disaster in Khana Local Government Area of Rivers State, Nigeria.* **Academicia: An International Multidisciplinary Research Journal,** 12(4), 2022, pp.514-529.

Buba, F.N., Ojinnaka, O.C., Ndukwu, R.I., Agbaje, G.I. & Orofin, Z.O. *Assessment of Flood Vulnerability in Some Communities in Lokoja, Kogi State, Nigeria, Using Participatory Geographic Information Systems.* **International Journal of Disaster Risk Reduction,** 55, 2021, p.102111.

Busari, A.O. *Conflict in the Workplace: Evaluating Emotional Intelligence as Therapeutic Approach in Resolving the Nurse-Physician Clashes in Two Secondary Hospitals in Oyo State, Nigeria.* **World Scientific News,** (135), 2019, pp.129-143.

Butu, A.W., Emeribe, C.N. & Ogbomida, E.T. *Effects of Seasonal Flooding in Benin City and the Need for a Community-Based Adaptation Model in Disaster Management in Nigeria*. **Nigerian Journal of Environmental Sciences and Technology (NIJEST)** Vol, 3(1), 2019, pp.112-128.

Cirella, G.T., Iyalomhe, F.O. & Adekola, P.O. *Determinants of Flooding and Strategies for Mitigation: Two-Year Sase study of Benin City.* **Geosciences,** 9(3), 2019, p.136.

Cobbinah, P.B., Amoako, C. & Yeboah, A.S. *Informality and the Politics of Urban Flood Management.* **Environment and Planning C: Politics and Space,** 41(4), 2023, pp.826-843.

Danhassan, S.S., Abubakar, A., Zangina, A.S., Ahmad, M.H., Hazaea, S.A., Ishak, M.Y. & Zhang, J. *Flood Policy and Governance: A Pathway for Policy Coherence in Nigeria.* **Sustainability,** 15(3), 2023, p.2392.

Danjibo Nathaniel, D., Adeoye Adesoji, E. & Ojo Oladayo, S. *Dynamics in the Response Mechanisms of Major Stakeholders During Flood Disaster: A Case Study of Kogi State, Nigeria.* **African Journal of Social Sciences and Humanities Research,** 2(2), 2019, pp.29-42.

Danso, S.Y., Ma, Y., Osman, A. & Addo, I.Y. *Integrating Multi-Criteria Analysis and Geospatial Applications for Mapping Flood Hazards in Sekondi-Takoradi Metropolis, Ghana.* **Journal of African Earth Sciences,** 209, 2024, p.105102.

Lead City University Ibadan DO NOT COPY

Dawson, D.A., Vercruysse, K. & Wright, N. *A Spatial Framework to Explore Needs and Opportunities for Interoperable Urban Flood Management.* **Philosophical Transactions of the Royal Society A,** 378(2168), 2020, p.20190205.

Doeffinger, T. & Rubinyi, S. *Secondary Benefits of Urban Flood Protection.* **Journal of Environmental Management,** 326, 2023, p.116617.

Doho, F.M., Falola, J.A. & Yunus, S. *Vulnerability Dynamics and Urban Flood Hazardscape Pattern: A Geospatial Analysis in Gombe City, Nigeria.* **Geosfera Indonesia,** 7(2), 2022, pp.194-206.

Ebekozien, A., Aigbavboa, C., Samsurijan, M.S., Radin Firdaus, R.B. & Salman, A. *Appraising Flood Resilience Technologies Role in Developing Cities: How Prepared is the Professional Stakeholder?.* **International Journal of Construction Management,** 24(7), 2024, pp.683-692.

Echendu, A.J. *Flooding in Nigeria and Ghana: Opportunities for Partnerships in Disaster-Risk Reduction.* **Sustainability: Science, Practice and Policy,** 18(1), 2023, pp.1-15.

Echendu, A.J. *Flooding, Food Security and the Sustainable Development Goals in Nigeria: An Assemblage and Systems Thinking Approach.* **Social Sciences,** 11(2), 2022, p.59.

Echendu, A.J. *Human Factors vs Climate Change; Experts' View of Drivers of Flooding in Nigeria.* **Natural Hazards Research,** 3(2), 2023, pp.240-246.

Echendu, A.J. *Relationship Between Urban Planning and Flooding in Port Harcourt City, Nigeria; Insights from Planning Professionals.* **Journal of Flood Risk Management,** 14(2), 2021, p.e12693.

Echendu, A.J. *Urban Planning, Sustainable Development and Flooding: A Case Study of Port Harcourt City,* Nigeria, 2019.

Ekwueme, B.N. *Machine Learning Based Prediction of Urban Flood Susceptibility from Selected Rivers in a Tropical Catchment Area.* **Civil Engineering Journal,** 8(9), 2022, p.1857.

Enoh, M.A., Njoku, R.E. & Okeke, U.C. *Modeling and Mapping the Spatial–Temporal Changes in Land Use and Land Cover in Lagos: A Dynamics for Building a Sustainable Urban City.* **Advances in Space Research,** 72(3), 2023, pp.694-710.

Fadairo, O., Alabi-Adelakun, O. & Adetunji, A. *Promoting Community-Led Water, Sanitation and Hygiene Interventions in Rural Settlements in Oyo State, Nigeria: Lessons from Agele and Mogba Communities of Ibarapa-East Local Government Area.* **Rural-Urban Link Sustain Dev,** 163, 2020, pp.176-201.

Faisal Koko, A., Yue, W., Abdullahi Abubakar, G., Hamed, R. & Noman Alabsi, A.A. *Analyzing Urban Growth and Cand Cover Change Scenario in Lagos, Nigeria Using Multi-Temporal Remote Sensing Data and GIS to Mitigate Flooding.* **Geomatics, Natural Hazards and Risk,** 12(1), 2021, pp.631-652.

Fashae, O.A., Tijani, M.N., Adekoya, A.E., Tijani, S.A., Adagbasa, E.G. & Aladejana, J.A. *Comparative Assessment of the Changing Pattern of Land Cover Along the*

Lead City University Ibadan DO NOT COPY

Southwestern Coast of Nigeria Using GIS and Remote Sensing Techniques. **Scientific African,** 17, 2022, p.e01286.

Gaisie, E. & Cobbinah, P.B. *Planning for Context-Based Climate Adaptation: Flood Management Inquiry in Accra.* **Environmental Science & Policy,** 141, 2023, pp.97-108.

Garba, H. & Abdulraheem, L. *Modelling and Estimation of the Rainfall Intensity and Flood Management in Efab-Estate, Abuja*. **Journal of Science and Technology Research,** 4(3), 2022.

Geekiyanage, D., Fernando, T., & Keraminiyage, K. *Assessing the State of the Art in Community Engagement for Participatory Decision-Making in Disaster Risk-Sensitive Urban Development.* **International Journal of Disaster Risk Reduction,** 51, 2020, p.101847.

Gerald-Ugwu, G.C., Egolum, C.C. & Emoh, F.I. *An Investigation of Factors Accelerating Rise in Building in the Flood Prone Areas of Port Harcourt.* **Iconic Research and Engineering Journals,** 3(1), 2019, pp.375-384.

Gerald-Ugwu, G.C., Egolum, C.C. & Emoh, F.I. *Investigating the Adoption of Property-Level Flood Protection (PLFP) by Homeowners in OBIO/AKPOR Port-Harcourt.* **International Journal of Thesis Projects and Dissertations,** 7(3), 2019, pp.48-57.

Ghimire, E. & Sharma, S. *Flood Damage Assessment in HAZUS Using Various Resolution of Data and One-Dimensional and Two-Dimensional HEC-RAS Depth Grids.* **Natural Hazards Review,** 22(1), 2021, p.04020054.

Hammond, M.J., Chen, A.S., Djordjević, S., Butler, D. & Mark, O. *Urban Flood Impact Assessment: A State-of-the-Art Review.* **Urban Water Journal,** 12(1), 2015, pp.14-29.

Hoang, L., Fenner, R.A. & Skenderian, M. *A Conceptual Approach for Evaluating the Multiple Benefits of Urban Flood Management Practices.* **Journal of Flood Risk Management,** 11, 2018, pp.S943-S959.

Hopkins, K.G., Welles, J.S., Pindilli, E.J., Noe, G.B., Claggett, P.R., Ahmed, L. & Metes, M.J. *Societal Benefits of Flood Plains in the Chesapeake Bay and Delaware River Watersheds: Sediment, Nutrient, and Flood Regulation Ecosystem Services.* **Journal of Environmental Management,** 345, 2023, p.118747.

Hua, P., Yang, W., Qi, X., Jiang, S., Xie, J., Gu, X., Li, H., Zhang, J., & Krebs, P. *Evaluating the Effect of Urban Flooding Reduction Strategies in Response to Design Rainfall and Low Impact Development.* **Journal of Cleaner Production,** 242, 2020, p.118515.

Ibeabuchi, U. *Mapping Seasonal Flood Inundation and Developing an Early Warning System for Lagos Metropolis (Nigeria): A Study Between 1990 and 2011.* **Water and Environmental Sustainability,** 3(2), 2023, pp.48-67.

IgudaLadan, S. & Saulawa, J.Y. *Flood Disaster Response and Recovery in Nigeria: a Case Study of 2018 Jibia Flood Disaster, Katsina State.* **Journal of Environmental Science, Toxicology and Food Technology,** 15(4), 2021, pp.08-18.

Lead City University Ibadan DO NOT COPY

Iroham, C.O., Okagbue, H.I., Ekanem, I.F., Peter, N.J., Samuel, O.W., Nto, S.E., Isiaka, S. & Adedotun, A.F. *Three Attributes Determining Land Values in Three Selected Housing Estates in Uyo, Nigeria.* **Frontiers in Sustainable Cities,** 6, 2024, p.1384945.

Jelili, M.O., Ajibade, A.A. & Alabi, A.T. *Informal Urban Migrant Settlements in Nigeria: Environmental and Socioeconomic Dynamics of Sabo, Ibadan.* **GeoJournal,** 88(2), 2023, pp.2045-2062.

Jiboku, J.O. & Jiboku, P.A. *Poverty and the Democratization Crisis in Nigeria: A Failure of the Social Contract.* Equidad y Desarrollo (34), 2019.

Jimoh, M.O., Bilewu, S.O., Saheed, A. & Aremu, H.S. *Multidimensional Approach to Mitigating Flood Risks and Impact: A Case Study of Rice Farming in Nigeria*, 2023.

Kasim, O.F., Wahab, B. & Oweniwe, M.F. *Urban Expansion and Enhanced Flood Risk in Africa: The Example of Lagos.* **Environmental Hazards,** 21(2), 2022, pp.137-158.

Kaur, S. *Barriers to Consumption of Fruits and Vegetables and Strategies to Overcome them in Low-and Middle-Income Countries: A Narrative Review.* **Nutrition Research Reviews,** 2022, pp.1-28.

Kim, S.K., Joosse, P., Bennett, M.M. & van Gevelt, T. *Impacts of Green Infrastructure on Flood Risk Perceptions in Hong Kong.* **Climatic change,** 162, 2020, pp.2277-2299.

Komolafe, A.A., Awe, B.S., Olorunfemi, I.E. & Oguntunde, P.G. *Modelling Flood-Prone Area and Vulnerability Using Integration of Multi-Criteria Analysis and HAND Model in the Ogun River Basin, Nigeria.* **Hydrological Sciences Journal,** 65(10), 2020, pp.1766-1783.

Ladan, S.I. *A Study of Flood Disaster Incidence in Jibia, Katsina State, Nigeria.* **Nigerian Geographical Journal,** 16(1), 2022.

Lamond, J., Adekola, O., Adelekan, I., Eze, B. & Ujoh, F. *Information for Adaptation and Response to Flooding, Multi-Stakeholder Perspectives in Nigeria.* **Climate,** 7(4), 2019, p.46.

Lashford, C., Rubinato, M., Cai, Y., Hou, J., Abolfathi, S., Coupe, S., Charlesworth, S., & Tait, S. *SuDS & Sponge Cities: A Comparative Analysis of the Implementation of Pluvial Flood Management in the UK and China.* **Sustainability**, 11(1), 2019, p.213.

Lawanson, O.I., Proverbs, D. & Ibrahim, R.L. *The Impact of Flooding on Poor Communities in Lagos State, Nigeria: The Case of the Makoko Urban Settlement.* **Journal of Flood Risk Management,** 16(1), 2023, p.e12838.

Lawyer, C., Davani, H.T. & Goharian, E. *Coalitional Game Theory for Stormwater Management and Green Infrastructure Practices.* **Journal of Water Resources Planning and Management,** 150(1), 2024, p.04023070.

Liman, Y.B., Akilu, S. & Idris, R.K. *An Assessment of the Extent and Impact of Annual Flooding in Kano Metropolis, Kano State-Nigeria.* **African Journal of Environmental Sciences and Renewable Energy,** 8(1), 2022, pp.25-42.

Leads City University Ibadan DO NOT COPY

Louw, E., Olanrewaju, C.C., Olanrewaju, O.A. & Chitakira, M. *Impacts of Flood Disasters in Nigeria: A Critical Evaluation of Health Implications and Management.* **Jàmbá: Journal of Disaster Risk Studies,** 11(1), 2019, pp.1-9.

Malekloo, A., Ozer, E. & Ramadan, W. *Bridge Network Seismic Risk Assessment Using ShakeMap/HAZUS with Dynamic Traffic Modeling.* **Infrastructures,** 7(10), 2022, p.131.

Maragno, D., Gaglio, M., Robbi, M., Appiotti, F., Fano, E.A. & Gissi, E. *Fine-Scale Analysis of Urban Flooding Reduction from Green Infrastructure: An Ecosystem Services Approach for the Management of Water Flows.* **Ecological Modelling,** 386, 2018, pp.1-10.

Marchesini, G., Beraud, H. & Barroca, B. *Quantification of Disaster Waste: Review of the Available Methods.* **International Journal of Disaster Risk Reduction,** 53, 2021, p.101996.

Martínez-Gomariz, E., Forero-Ortiz, E., Guerrero-Hidalga, M., Castán, S. & Gómez, M. *Flood Depth–Damage Curves for Spanish Urban Areas.* **Sustainability,** 12(7), 2020, p.2666.

Mashi, S.A., Inkani, A.I., Obaro, O. & Asanarimam, A.S. *Community Perception, Response and Adaptation Strategies Towards Flood Risk in a Traditional African City.* Natural Hazards, 103, 2020, pp.1727-1759.

Mfon, I.E., Oguike, M.C., Eteng, S.U. & Etim, N.M. *Causes and Effects of Flooding in Nigeria: A Review.* **East Asian Journal of Multidisciplinary Research,** 1(9), 2022, pp.1777-1792.

Miguez, M.G., Mascarenhas, F.C.B., Canedo de Magalhães, L.P. & D'Alterio, C.F.V. *Planning and Design of Urban Flood Control Measures: Assessing Effects Combination.* **Journal of Urban Planning and Development,** 135(3), 2019, pp.100-109.

Mobley, W., Atoba, K.O. & Highfield, W.E. *Uncertainty in Flood Mitigation Practices: Assessing the Economic Benefits of Property Acquisition and Elevation in Flood Prone Communities.* **Sustainability,** 12(5), 2020, p.2098.

Muhammed, O.Q. & Eludoyin, A.O. *A Multi-Criteria Evaluation of Urban Flood Vulnerability and Perception in Osun River Basin, Southwest Nigeria.* **In Geoinformatics for Sustainable Urban Development** CRC Press, 2023, pp. 117-143.

Nkeki, F.N., Bello, E.I. & Agbaje, I.G. *Flood Risk Mapping and Urban Infrastructural Susceptibility Assessment Using a GIS and Analytic Hierarchical Raster Fusion Approach in the Ona River Basin, Nigeria.* **International Journal of Disaster Risk Reduction,** 77, 2022, p.103097.

Nkwunonwo, U.C., Whitworth, M., & Baily, B.B. *A Review of the Current Status of Flood Modelling for Urban Flood Risk Management in the Developing Countries.* **Scientific African,** 7, 2020, p.e00269.

Lead City University Ibadan DO NOT COPY

Nofal, O.M., van de Lindt, J.W. & Do, T.Q. *Multi-Variate and Single-variable Flood Fragility and Loss Approaches for Buildings.* **Reliability Engineering & System Safety,** 202, 2020, p.106971.

Nsiegbe, D.K., Weli, V.E., Chukwu-Okeah, G.O., Eludovin, O.S., Abali, T.P., Michael, I.T.I. & Nkii, L.B. *A GIS-Based Flood Risk Assessment in the Urban Catchment of Uyo Metropolis, Nigeria.* **International Journal of Information Systems and Informatics,** 2(4), 2021.

Nsiegbe, D.K., Weli, V.E., Chukwu-Okeah, G.O., Eludoyin, O.S., Abali, T.P., Inko-Tariah, I.M. & Nkii, L.B. *An Assessment of Flood Vulnerability in Selected Urban Catchment: A Case Study of Port Harcourt Metropolis, Nigeria.* **World Bulletin of Social Sciences,** 5, 2021, pp.1-22.

Nwokoye, C.H., Ositanwosu, O. & Umeh, I. *Development of an Advanced Knowledge Domain for Coordinated Flood Inundation Management in Developing Nations*. **Egyptian Computer Science Journal,** 44(3), 2020.

Ogie, R.I., Adam, C. & Perez, P. *A Review of Structural Approach to Flood Management in Coastal Megacities of Developing Nations: Current Research and Future Directions.* **Journal of Environmental Planning and Management,** 63(2), 2020, pp.127-147.

Ogunbode, T.O. & Oyebamiji, V.O. *Towards a Sustainable City Environment: Resolving the Challenge of Flooding in a Growing Tropical City in Osun State, Nigeria-A Review.* **Aswan University Journal of Environmental Studies,** 3(4), 2023, pp.346-356.

Okonofua, E.S. & Kayode-Ojo, N. *Urban Flooding Vulnerability Analysis Using Weighted Linear Method with Geospatial Information System.* **African Scientific Reports,** 2023, pp.104-104.

Okoye, C.B. & Ojeh, V.N. *Mapping of Flood Prone Areas in Surulere, Lagos, Nigeria: A GIS Approach.* **Journal of Geographic Information System,** 7(2), 2015, pp.158-176.

Okunola, O.H. & Olawuni, P.O. *Determinants of Household Flood Resilience Strategies in Kaduna Metropolis, Nigeria.* **Urban Climate,** 44, 2022, p.101216.

Ola, A. *Climate Change Effects and Livelihood-Adaptation Strategies by the Urban Poor in Ibadan, Nigeria.* **Town and Regional Planning,** 81, 2022, pp.24-38.

OlaOlorun, F.M. & John, N.A. *A Couple-Based Tender Transformative Intervention to Enhance Women's Participation in Household Decision-Making: Results From a Cluster Randomised Control Trial in Ibadan, Nigeria.* **Development in Practice,** 31(8), 2021, pp.1070-1082.

Ologunorisa, T.E., Obioma, O. & Eludoyin, A.O. *Urban Flood Event and Associated Damage in the Benue Valley, Nigeria.* **Natural Hazards,** 111(1), 2022, pp.261-282.

Olokeogun, O.S., Ayanlade, A. & Popoola, O.O. *Assessment of Riparian Zone Dynamics and its Flood-Related Implications in Eleyele Area of Ibadan, Nigeria.* **Environmental Systems Research,** 9(1), 2020, p.6.

Lead City University Ibadan DO NOT COPY

Onajomo, T.S. *Geospatial Assessment of Land Use/Cover, Rainfall, and Flood Incidents in Eti–Osa, Lagos, Nigeria*. **South African Journal of Geomatics,** 11(2), 2022, pp.202-217.

Oni, M.A. & Ayegba, S. *Environmental Policies, Agencies and Flood Management in Selected Gtates in Nigeria (2005-2021): The gaps and the Challenges.* **KIU Journal of Humanities,** 7(2), 2022, pp.51-62.

Oyelade, O.K. & Omobowale, A.O. *'Warfare'Pentecostalism, Poverty and Welfare Provisioning in Southwestern Nigeria.* **International Journal of Critical Diversity Studies,** 2(2), 2019, pp.37-54.

Oyetunji, A.K., Amaechi, C.V., Dike, E.C., Ayoola, A.B. & Olukolajo, M.A. *Factors Influencing Stakeholders' Decision to Invest in Residential Properties: A Perceptual Analysis of Flood-Risk Areas.* **Buildings**, 13(6), 2023, p.1560.

Pagliacci, F., Defrancesco, E., Bettella, F. & D'Agostino, V. *Mitigation of Urban Pluvial Flooding: What Drives Residents' Willingness to Implement Green or Grey Stormwater Infrastructures on their Property?.* **Water,** 12(11), 2020, p.3069.

Parent, O., Hofe, R.V., Oh, S., Ervin, P., Khalid, M.A. & Yeghiazarian, L. *Estimating the Socioeconomic Impacts of Flooding on Regional Economies with a Computable General Equilibrium Model.* **Water Resources Research,** 59(9), 2023, p.e2022WR033474.

Peter, N.J., Okagbue, H.I., Obasi, E.C. & Akinola, A.O. *Review on the Application of Artificial Neural Networks in Real Estate Valuation.* **International Journal,** 9(3), 2020, pp.5-11.

Petersen, I., van Rensburg, A., Kigozi, F., Semrau, M., Hanlon, C., Abdulmalik, J., Kola, L., Fekadu, A., Gureje, O., Gurung, D. & Jordans, M. *Scaling up Integrated Primary Mental Health in Six Low-and Middle-Income Countries: Obstacles, Synergies and Implications for Systems Reform.* BJPsych Open, 5(5), 2019, p.e69.

Pinter, N. & Rees, J.C. *Assessing Managed Flood Retreat and Community Relocation in the Midwest USA.* **Natural Hazards,** 107, 2021, pp.497-518.

Poku-Boansi, M., Amoako, C., Owusu-Ansah, J.K. & Cobbinah, P.B. *What the State does but Fails: Exploring Smart Options for Urban Flood Risk Management in Informal Accra, Ghana.* **City and Environment Interactions,** 5, 2020, p.100038.

Popoola, A.A., Adeleye, B.M., Adeniji, K.N., Babalola, T.O. and Magidimisha-Chipungu, H.H. *Indicators for Disaster Vulnerability to the Overflowing of the Niger River in Adjoining Settlements in the Confluence City of Lokoja, Nigeria,* 2022.

Royal, A. & Walls, M. *Flood Risk Perceptions and Cnsurance choice: Do Decisions in the Floodplain Reflect Over Optimism?.* **Risk Analysis,** 39(5), 2019, pp.1088-1104.

Sen, M.K., Dutta, S. & Kabir, G. *Evaluation of Interaction between Housing Infrastructure Resilience Factors Against Flood Hazard Based on Rough DEMATEL Approach.* **International Journal of Disaster Resilience in the Built Environment,** 12(5), 2021, pp.555-575.

Lead City University Ibadan DO NOT COPY

Skrydstrup, J., Löwe, R., Gregersen, I.B., Koetse, M., Aerts, J.C., de Ruiter, M. & Arnbjerg-Nielsen, K. *Assessing the Recreational Value of Small-Scale Nature-Based Solutions when Planning Urban Flood Adaptation.* **Journal of Environmental Management,** 320, 2022, p.115724.

Sousa, T., Soares, T., Pinson, P., Moret, F., Baroche, T., & Sorin, E. *Peer-to-Peer and Community-Based Markets: A Comprehensive Review.* **Renewable and Sustainable Energy Reviews,** 104, 2019, pp.367-378.

Sun, Q., Nazari, R., Karimi, M., Rabbani Fahad, M.G. & Peters, R.W. *Comprehensive Flood Risk Assessment for Wastewater Treatment Plants Under Extreme Storm Events:* A Case Study for New York City, United States. **Applied Sciences,** 11(15), 2021, p.6694.

Tanir, T., de Lima, A.D.S., de A. Coelho, G., Uzun, S., Cassalho, F. & Ferreira, C.M. *Assessing the Spatiotemporal Socioeconomic Flood Vulnerability of Agricultural Communities in the Potomac River Watershed.* **Natural Hazards,** 108(1), 2021, pp.225-251.

Tiepolo, M. & Galligari, A. *Urban Expansion-Flood Damage Nexus: Evidence from the Dosso Region, Niger.* **Land Use Policy,** 108, 2021, p.105547.

Toka, S.O. *Change in Land Cover, Rainfall and Flood Incidence in Eti–Osa, Lagos, Nigeria.* **South African Journal of Geomatics,** 11(2), 2022.

Vercruysse, K., Dawson, D.A., Glenis, V., Bertsch, R., Wright, N. & Kilsby, C. *Developing Spatial Prioritization Criteria for Integrated Urban Flood Management Based on a Source-to-mpact Flood Analysis.* **Journal of Hydrology,** 578, 2019, p.124038.

Webber, J.L., Chen, A.S., Stevens, J., Henderson, R., Djordjević, S. & Evans, B. *Targeting Property Flood Resilience in Flood Risk Management.* **Journal of Flood Risk Management,** 14(3), 2021, p.e12723.

Webber, J.L., Gibson, M.J., Chen, A.S., Savic, D., Fu, G. & Butler, D. *Rapid Assessment of Surface-Water Flood-Management Options in Urban Catchments.* **Urban Water Journal,** 15(3), 2018, pp.210-217.

Weber, R.., *The Rhetoric of Positivism Versus Interpretivism: A Personal View.* **Management Information Systems Research Center,** University of Minnesota. Vol 28, No. 1, March, 2004.

Week, D.A., Wizor, C.H. & Eludoyin, O.S. *Assessment of Community's Resilience to Flooding in the Flood-Prone Areas of the Core Niger Delta, Nigeria.* **J. Geogr. Environ. Earth Sci. Int.,** 23(4), 2019, pp.1-13.

Wizor, C.H. & Akpamgbo, R.A. *Assessment of the Impact of Urban Floods on Real Property Development in the Port Harcourt Metropolis, Nigeria.* **Asian Journal of Geological Research,** 2(3), 2019, pp.179-194.

Yiwo, E., Jato-Espino, D., Carracedo, P. & de Brito, M.M. *Multi-Stakeholder Perception on Flood Management in Ghana: Analysis of Drivers and Potential Solutions, with a*

Lead City University Ibadan DO NOT COPY

Focus on Surface Permeability. **International Journal of Disaster Risk Reduction,** 76, 2022, p.102990.

Yoade, A.O., Onifade, V.A. & Olajide, T.P. *An Assessment of Public Perception of Flooding in Akure, Nigeria.* **International Journal of Development and Sustainability ISSN**, 2019, pp.2186-8662.

Zhang, S., Zevenbergen, C., Rabé, P. & Jiang, Y. *The Influences of Sponge City on Property Values in Wuhan, China.* **Water,** 10(6), 2018, p.766.

Online Publications

National Emergency Management Agency (NEMA), 2012.

National Population Council (NPC). *Report on Nigeria National Population Census on 2006 Census.* Abuja: NPC, 2022

Unpublished Theses/Dissertations

Aiyewunmi, T. *Challenges and Potential Solutions to Pluvial Flood Risk in Urban Tropical African Communities, a Case Study Using Ijebu-Ode, in South West Nigeria (Doctoral Dissertation, University of Liverpool),* 2023.

Danladi, A.M.O.S. *Indigenous Knowledge in Flood Disaster Risk Reduction in Kaduna Town Nigeria* (Doctoral Dissertation, PhD Dissertation Submitted to Universiti Teknologi Malaysia), 2019.

Ghimire, E. *Evaluation of One-Dimensional and Two-Dimensional HEC-RAS Models for Flood Travel Time Prediction and Damage Assessment Using HAZUS-MH: A Case Study of Grand River, Ohio* (Doctoral Dissertation), 2019.

Shuaibu, A. *Flood Reduction Through Flood Risk and Vulnerability Assessment and Mapping in Hadejia River Basin, Nigeria* (Master's Thesis, PAUWES), 2020.

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Appendix I

Department of Estate Management,

Faculty of Environmental Design and Management

Lead City University, Ibadan, Oyo State, Nigeria

Dear Sir/Madam,

Impact of Ibadan Urban Flood Management Project on Property Values in Selected Project Areas in Ibadan, Oyo State

The questions below are drawn to carry out independent research on the above-stated topic in Partial Fulfilment of the requirement for the Award of Master of Science in Estate Management. Your area happens to fall within the Ibadan locality considered for this study. You are therefore implored to provide answers to the questions honestly and as best as you can. Your response will be treated with absolute confidentiality and used only for academic purposes.

Thank you.

Yours faithfully,

Babajide Femi OGUNTOKUN

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"Please tick (√) and fill the blank spaces where applicable"

Locational characteristics of the respondents

(1) Local Government
Area: ……..
(2) Street: ……
……
(3) Area: ……
….

Section A: Socio-Economics Characteristics of Property Owners/Tenants

(4) **Gender:**(a)Male [ ] (b) Female [ ]
(5) **Age:** (a) Below 18 [ ] (b) 19-30 [ ] (c) 31-45 [ ] (d) 46 and above [ ]
(6) **Marital Status:** (a) Married [ ] (b) Single [ ] (c) Divorced [ ] (d) Widow [ ]
(7) **Occupational of Respondent:** (a) Technician [ ] (b) Trading [ ] (c) Artisan [ ]
(d) Civil Servant [ ] (e) Others Specify
(8) **Education Level:**
(i) Primary School Leaving Certificate [ ]
(ii) WASC/GCE/NECO [ ]
(iii)NCE/OND/ND [ ]
(iv)HND/B.Sc [ ]
(v) M.Sc/Ph.D [ ]
(vi)No Formal Education [ ]
(9) **Monthly Level of Income**
(a) Below ₦15,000 [ ]
(b) ₦16,000 – ₦40,000 [ ]
(c) ₦41,000 – ₦100,000 [ ]
(d) ₦101,000 – Above [ ]
(10) **Ownership Status**
(a) Landlord [ ]
(b) Tenant [ ]

(11) Are you aware of IUFMP in Oyo State? ……..
(12) Are you aware of the IUFMP intervention project(s) done in your area/community? .....
(13) If yes, what project(s) have been done so far in your area/community? ……..
(14) How long has the project been executed? …….
(15) How would you rate the project? Good; Fair; Poor.
(16) Where the community members consulted before the project commenced? ……...
(17) If yes, what was the role of the community in the implementation?

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(18) How has the presence of the IUFMP affected property value in your area
Please (√) where appropriate

S/N	Effect of IUFMP on Property Value	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	The rental value of properties have increased after the project was done					
2.	There are reduced vacant properties after the project was done					
3.	There is an increased purchase of property					
4.	Rapid influx of economic activities					
5.	There is no impact have been felt					
6.	There is better vehicular and human movement					
7.	There is less dirt and filthiness					

(19) Kindly indicate the rental value of the following types of property in the study area for the period on the table provided below

Types of building	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A room self-contained											
A room and parlour apartment											
2 bedroom flat											
3 bedroom flat											
4 bedroom flat											
Bungalow											
Shops											
Offices											

(20) **What is the land sale value?**

Before the urban flood management project started, a piece of land is sold for approximately NGN_____.

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After the urban flood management project completed, a piece of land is sold for approximately NGN_____.

(21) What do you think influenced the project intervention in your community?

(22) Was there a serious flood disaster in your community before the project intervention?

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Dear Esteemed Estate Surveyors and Valuers

Impact of Ibadan Urban Flood Management Projects on Property Values in Selected Project Areas in Ibadan, Oyo State

Dear Respondent,

This questionnaire seeks to know your honest view on the above topic.

Kindly ensure that all blanks are filled. This exercise is strictly for academic purposes and you are not required to enter your personal information neither would such be published. Thank you for your Time.

Babajide Femi OGUNTOKUN

Section A, Respondent Information

"Please tick (√) and fill the blank spaces where applicable"

1. Name of firm (optional)…….
2. Year(s) in practice…….
3. Sex: Male [ ], Female [ ]
4. Age (Years): <25 [ ], 26-40 [ ], 41-60 [ ], Over 60 [ ]
5. Position at the present Company: Principal Partner [ ], Manager [ ] Surveyor [ ], Others Specify…….
6. Years of Experience: 10yrs or less[ ], 10-20 [ ], Over20years [ ]
7. Educational Level: HND [ ], B.Sc. [ ] M.Sc. [ ], Ph.D. [ ]
8. Professional Qualification: Fellow [ ], Associate [ ], Probationer [ ], Graduate [ ]
9. Location ……

Section B – Profile of the Urban Flood Management Intervention Projects

1. Do you notice any IUFMP projects within your jurisdiction?
   YES [ ], NO [ ]
2. If yes, what type of flood intervention projects do you notice? ……..

Section C Land Values

What are the types and characteristics of the properties within the IUFMP areas? ……

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Section D: Trent in Property Rental Values between the years 2012 to 2022

Types of building	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A room self-contained											
A room and parlour apartment											
2 bedroom flat											
3 bedroom flat											
4 bedroom flat											
Bungalow											
Shops											
Offices											

Trent in Property Capital Values or Evidence of Sales between the years 2012 to 2022

Types of Property	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential											
Commercial											
Industrial											
Agricultural											

Section E Effect of Flood Management Interventions on Property Values

1. As a result of the urban flood management intervention project, the value of lands in our area has increased. YES [ ], NO [ ]
2. Movement and transportation of human and goods is better now as a result of the urban flood management system YES [ ], NO [ ]
3. We are witnessing increasing traffic in interested parties on land and properties in this area as a result of the Urban flood management project YES [ ], NO [ ]
4. The Urban flood management project encroached on some properties of individuals/organizations thereby depreciating same. YES [ ], NO [ ]
5. Before the urban flood management project started, a piece of land is sold for approximately NGN_____.
6. After the urban flood management project started, a piece of land is sold for approximately NGN_____.

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Question Guide:

Target- Key Informant- IUFMP Officials

1. Position in IUFMP

2. What type of flood management intervention project(s) does your agency provide?

Probe for: Culvert, Drainages, Bridges, etc...

3. When did your agency begin to assist with these projects in communities in Ibadan? ***Probe for specific time, month, year or period***

4. What criteria do you use for the selection of beneficiary for your IUFMP project?..... ***Probe for beneficiary's request, poverty state of the beneficiary community, high level of flooding***

5. What factor(s) influence the choice of the intervention provided in each community? ***Probe for need of the community, request of the community etc***

6. What has been the nature of response of the host community to the project?..... ***Probe for cooperation, friendliness, revolt***

7. In what ways do the communities contribute to the IUFMP projects assigned to their communities?.....***Probe for financial contribution, manpower contribution, provision of land, others***

8. How are these projects implemented in these communities?.....

   Probe for direct labour, use of contractors, others

9. What difficulties do you encounter in the implementation of the IUFMP projects in these communities?.....***Probe for revolt of host community, lack of adequate equipments, to rocky ground***

10. How do you think this difficulties can be overcome?.....***Probe for...***

11. What have been the achievement of your agency in the IUFMP project provision?.....***Probe for better livelihood for the citizen, influx of business and industry to the beneficiary community, others***

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12. Access the level of performance of the IUFMP in these communities ……***Probe for usage, breakdown***

13. Do you think the IUFMP project in the communities have enhanced more commercial activities to better the life of the citizen of the communities……

14. Give reasons for your response……

15. What measures do you have in places for the sustainability of the projects?.....***Probe for community management committee set up, maintenance measures in place by the agency***

16. How can the projects be replicated in other areas?.....***Probe for replication else where***

17. Access the contribution of these projects to the development of the area?.....***Probe for migration of business to the communities, better livelihood***

18. Access the contribution of these projects to property values in the area?.....***Probe property value***

19. What are the outcomes of the IUFMP projects in the communities?.....***Probe for enhanced quality to communities***

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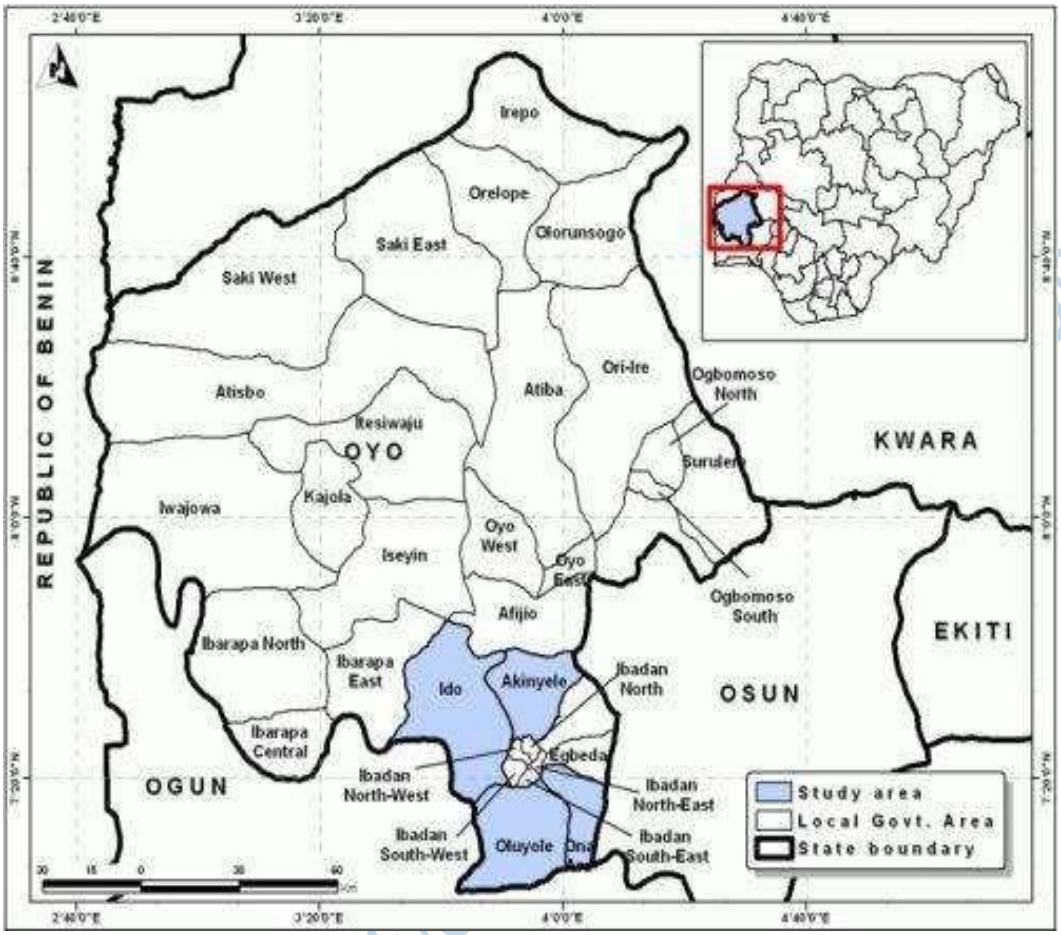
Appendix II

Maps



Map of Nigeria showing Ibadan and Oyo State

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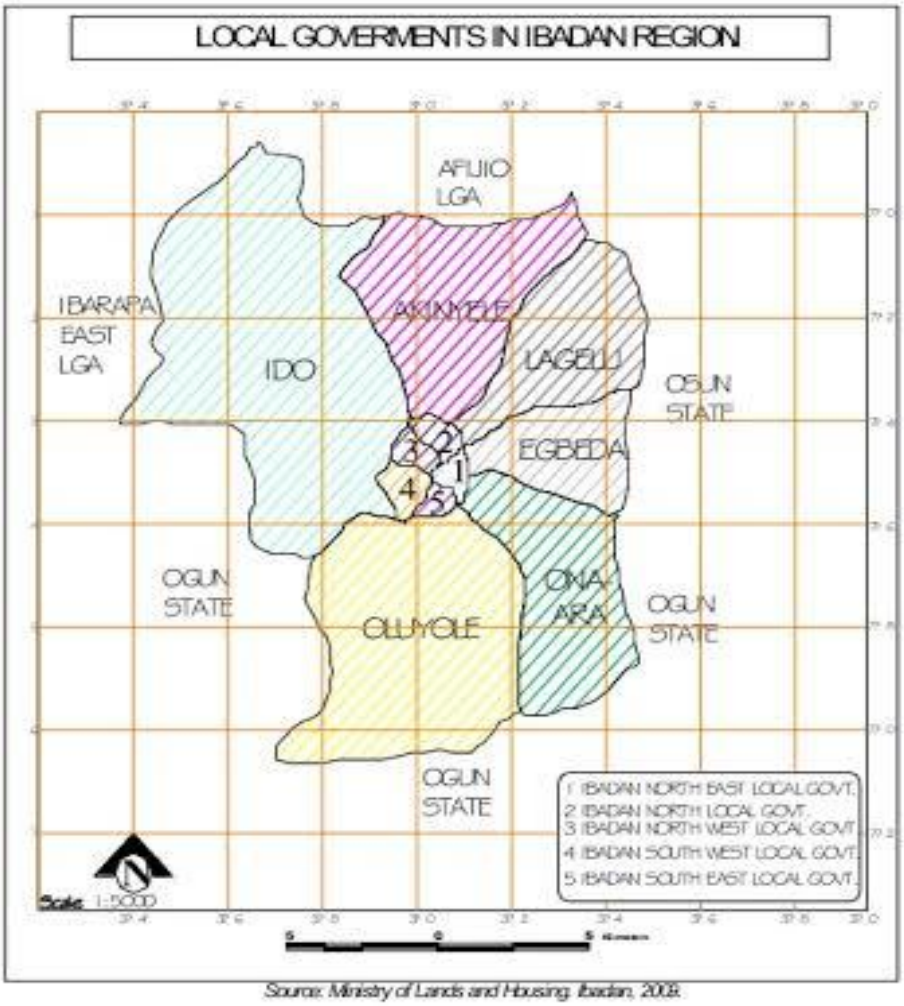
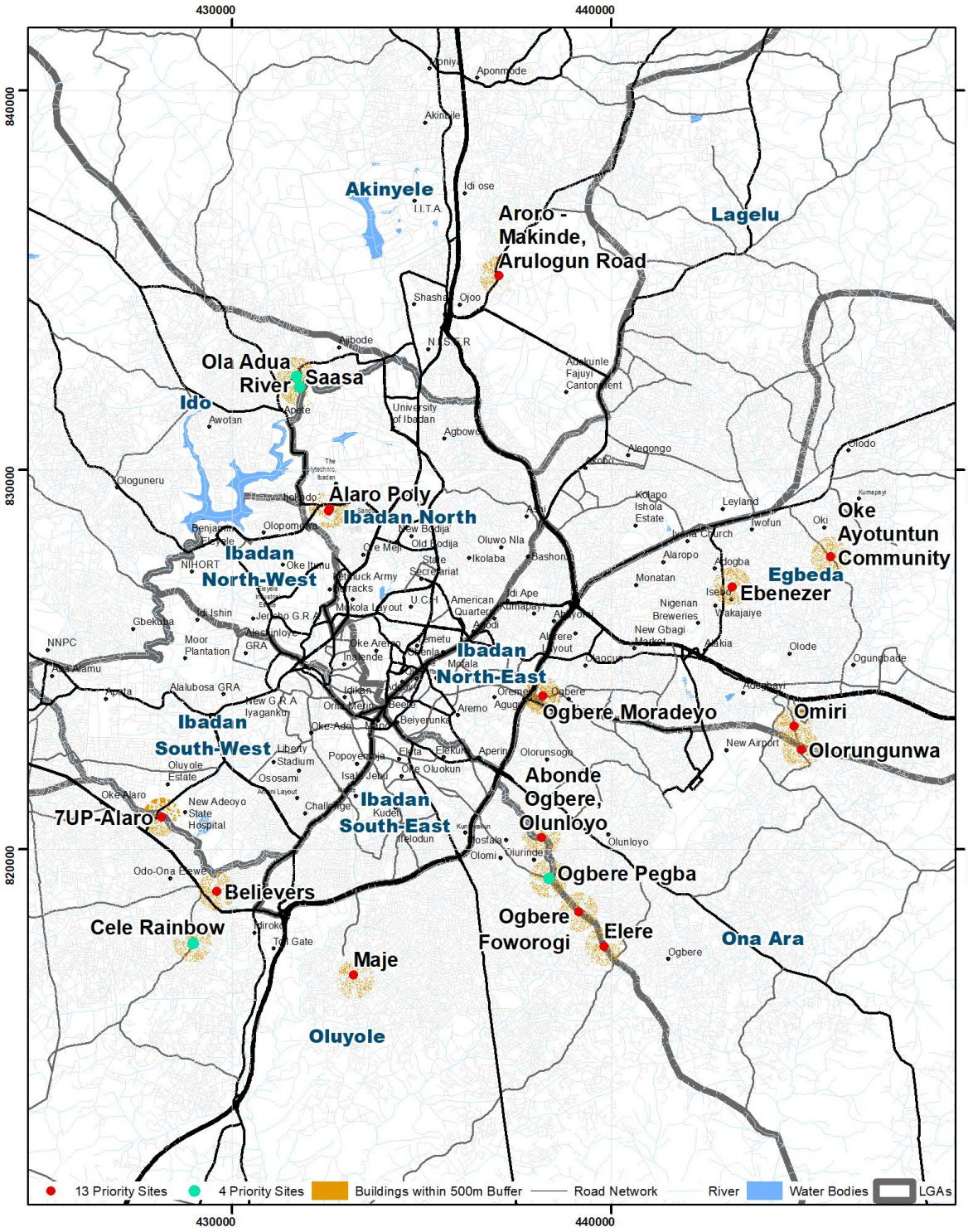
Vol 3, No 7, 2013

Figure 1: Map of Ibadan with Eleven Local Government Areas



Source: Ministry of Lands and Housing, Ibadan, 2008.

Map Showing the Local Governments in Ibadan



Map of Ibadan City Showing 17 IUFMP Priority Intervention Sites in Ibadan

Bio-data

A. Personal Data

1. **Name and Address** **Babajide Femi OGUNTOKUN**
   16, Ajayi Obe Street, Sonbeam Area, Bodija Ibadan.
   jideoguntokunanco@gmail.com
   07033161416/07085251025
2. **Date and Place of Birth**: 30th September, 1979
   Afijio, Oyo State
3. **Nationality:** Nigerian
4. **Marital Status:** Single
5. **No. & Ages of Children:** Nill
6. **Name and Address of Next of Kin:** Oluwanike Olufunke Oguntokun
   16, Ajayi Obe Street, Sonbeam Area, Bodija, Ibadan
   nikeoguntokun@gmail.com
   08023755019
7. **Present Position**: Lecturer II
8. **Faculty:** Environmental Design and Management
9. **Department**: Estate Management
10. **Institution:** Lead City University

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B. Educational Background

1) Educational Institutions Attended with Dates

- 1983-1989 Nigerian College of Aviation Staff School, Zaria, Kaduna State.
- 1989-1994 Olivet Baptist High School, Oyo, Oyo State, Nigeria.
- 1996-1998 The Polytechnic, Ibadan, Ibadan, Oyo State, Nigeria.
- 2000-2002 The Polytechnic, Ibadan, Ibadan, Oyo State, Nigeria.
- 2008-2012 University of Ibadan, Ibadan, Oyo State, Nigeria.
- 2016-2017 University of Ibadan, Ibadan, Oyo State, Nigeria.
- 2018-2021 Joseph Ayo Babalola University, Ikeji Arakeji, Osun State, Nigeria.
- 2022 - Date Lead City University, Ibadan, Ibadan, Oyo State, Nigeria.

2) Academic Qualifications

- Primary School Testimonial 1989
- Senior Secondary School Leaving Testimonial 1994
- National Diploma in Estate Management 1998
- Higher National Diploma in Estate Management 2002
- M.Sc. Housing 2012
- Master in Project Development and Implementations 2017
- B.Sc. Estate Management 2021
- M.Sc. Estate Management (In View)

3) Professional Qualifications

Associate Member Above 10 Years of the Nigerian Institution of Estate Surveyors and Valuers (M03152)

Registered Member, Estate Surveyors and Valuers Registration Board

Fellow, Institute of Chartered Economist of Nigeria

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Associate Member, Nigeria Institute of Management

Fellow, Institute of Professional Managers and Administrators

Fellow and Doctor of Research, Corporate Institute of Strategic Management

Fellow, Institute of Corporate Administration

C. Award and Fellowship:

i. Merit Award for contribution to growth of Achievers Club.

ii. Academician of the year award, Diocese of Ibadan, St. Peters Anglican Church, Apete, Ibadan.

D. Work Experience

1. Present and Previous Work Experience with Dates

- February 2023 – Till Date: Lecturer II, Lead City University, Ibadan.
- January 2021 - December 2022: Volunteer Lecturer, Ajayi Crowther University, Oyo.
- 2012 – Date: Senior Partner, Jide Oguntokun & Co, Estate Surveyors & Valuers
- 2008 – 2012: Estate Surveyor, Jide Taiwo & Co, Estate Surveyors & Valuers.
- 2003 – 2004: NYSC, Ministry of Lands, Housing and Survey, Oyo State.

E. Membership of Professional Bodies

Associate Member of the Nigerian Institution of Estate Surveyors and Valuers.

Member, Estate Surveyors and Valuers Registration Board.

Fellow, Institute of Chartered Economist of Nigeria.

Associate Member, Nigeria Institute of Management.

Fellow, Institute of Professional Managers and Administrators

Fellow and Doctor of Research, Corporate Institute of Strategic Management.

Fellow, Institute of Corporate Administration.

Member, Chartered Institute of Auctioneers.

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Member, African Real Estate Society. AfRES.

F. Publications

- Project/Thesis (Unpublished)

  i. The nature and challenges of managing donor assisted water and sanitation facilities. A case study of Oyo State. - M.Sc. Housing Dissertation 2012 submitted to Department of Urban and Regional Planning, University of Ibadan.
  ii. An evaluation of the water and sanitation facilities in rural areas. A case study of RUWATSAN projects, Oyo State. - MPDI. Thesis 2017 submitted to Department of Sociology, University of Ibadan.
  iii. Analysis of Challenges faced by Community in Participating in Public Infrastructure Development in Ibadan, Oyo State. B.Sc. Thesis 2021 submitted to Department of Estate Management, Joseph Ayo Babalola University.
  iv. Effect of Ibadan Urban Flood Management Project on Property Values in Selected Project areas in Ibadan, Oyo State. Ongoing Project Research Work, Lead City University, Ibadan.

- Books/Monographs: Nil

  Authored books: Nil

  Edited books: Nil

  Contributions to books: Nil

- **Published Journal Articles**:

  i. Adedokun, A. R, I. Fayomi, **Oguntokun B. F**. & Soretire, O. **(2022)**. Analysis Challenges affecting Community Participation in Public Infrastructure Development in Ibadan. Journal of Built Environment and Geological Research (AJBEGR), 27(4), 1-4
  ii. Adeleke, M. A., Moradeyo, O. S.**, Oguntokun, B. F. (2023).** Impact of Housing Condition on Rental Values of off Campus Student Accommodation in Akuo, Kwara State Polytechnic Nigeria. Advance Journal of Current Research (AJCR) Vol 8: Issue 9, 2023; ISSN 2323-1744

- **Articles Accepted for Publication: Nil**

- **Edited and Refereed Conference Proceedings:**

  I. I. Fayomi, R. A. Adedokun, **B. F. Oguntokun** & Ayodele O. O. (2023) An Evaluation of Real Estate Managers Ethical Decision Making in Property Management Practices in Ibadan Metropolis, Nigeria. Proceedings on the Lead City University Postgraduate Multidiscilinary Conference (MCONVO), LCU, Ibadan, Nigeria. Theme: Innovative Research and Quality Education for Sustainable Development. October 16th to 19th, 2023.

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4) Chapters in Books

Nil

5) Manuscript Submitted for Publication/Conference

Nil

6) Paper Presented at Conference/Workshop

Nil

7) Paper and Work in Progress

Nil

8) Book Reviews and Communications in Scholarly Journals: Nil

9) Technical Report: Nil

10) Other Publications: Nil

11) Creative Work: Nil

G. Notable Scholarly or Professional Accomplishment

- Member, Corporate Affairs Commission Committee, Nigerian Institution of Estate Surveyors and Valuers. 2018 - Date

H. Major Conferences, Seminar and Workshops Attended with Dates

- Nigerian Institution of Estate Surveyors and Valuers, 52nd Annual National Conference 2022
- NIESV, Oyo State 2023 MCPD Seminar
- NIESV, Osun State 2022 MCPD Seminar
- Nigerian Institution of Estate Surveyors and Valuers, 51st Annual National Conference 2021
- Nigerian Institution of Estate Surveyors and Valuers, Mandatory Continuing Professional Development Seminar, Osun State 2019.

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- Nigerian Institution of Estate Surveyors and Valuers, 50th Anniversary National Mandatory Continuing Professional Development Seminar 2019, Oyo State.
- Nigerian Institution of Estate Surveyors and Valuers, 48th Annual National Conference 2018
- Ethical Conduct in Higher Institutions (Workshop Organized for Academic Staff at Lead City University, Ibadan. 2018)
- NIESV, Oyo State 2023 MCPD Seminar
- NIESV, Osun State 2022 MCPD Seminar

I. Extracurricular Activities

- Travelling, Reading, and Meeting people.

J. Others

K. Names and Address of Referees:

- Dr. Igho Fayomi
  Department of Estate Management,
  Faculty of EDM, Lead City University.

- Prof. B. T. Aluko
  Dept. of Estate Management,
  Faculty of EDM,
  Obafemi Awolowo University,
  Ile-Ife, Osun State.

- Dr Oluwanisola Adebisi
  Dept. of Estate Management,
  Faculty of EDM,
  Joseph Ayo Babalola University,
  Ikeji Arakeji, Osun State.

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_____ _____

Signature **Date**

The University Compliance Certification

This is to certify that, this Thesis was Written by Babajide Femi OGUNTOKUN with Matriculation number LCU/PG/003198 in the Department of Estate Management, Faculty of Environmental Design & Management, Lead City University, Ibadan Oyo State, in full compliance with the approved University format and style.

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Signature	**Date**