THE EFFECT OF FLOODING ON RESIDENTIAL PROPERTY VALUES

(A CASE STUDY OF ADURALERE ILORIN EAST LGA KWARA STATE)

BY

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CERTIFICATION

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DEDICATION

This project is dedicated to Almighty Allah, the giver of wisdom and knowledge, for the opportunity if strength and privilege given to me for the completion of my course of study.

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Abstract

Flooding is a recurring issue in Aduralere, Ilorin East LGA, caused by poor drainage and urban planning, and it threatens property values and investment confidence. This study aims to identify the causes of flooding, examine its impact on real estate decisions, and evaluate its effects on residential property values. Using surveys, interviews, and secondary data, the research will analyze flood-property value correlations. It focuses on property trends over the past 5–10 years. Findings will guide property owners, investors, and policymakers in flood risk management and urban planning. A negative correlation between flooding and property value is expected.

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CHAPTER ONE

1.0 Introduction

1.1 Background to the Study

Flooding is a natural disaster and sometimes can be caused by human activities. Flooding is one of the most frequent and widespread disasters which affect life, livelihood and properties globally. It basically accounts for nearly more than half of all the natural disasters in both developed and developing nations of the world (UNISDR, 2012). Flood disasters frequently occur in Nigeria, as such most states are experiencing increased distress from yearly flooding most often during the rainy seasons due to rainfall (Aja and Olaore, 2014). Flooding can be defined as a high-water stage in which water overflows its natural or artificial banks into normally dry land causing unpredicted damage and threat to life. It is a situation that results when land that is usually dry is covered with water from overflowing rivers or heavy rain, flooding occurs naturally on the floodplains which are prone to flood disaster (Omisore, 2011). Udobi (2021) noted that damage caused by floods to agriculture, homes and public facilities around the world runs into several millions of dollars annually. Floods are among the most devastating natural disasters in the world, claiming more lives and causing more property damage than any other natural phenomena due to its occurrences (Oginni, Chukuma, Akinrogunde, and Akinola, 2021). It occurs when water in the river overflows its banks, or sometimes results from a constructed dam. Across the globe, floods have posed tremendous danger to people's lives and properties. Flooding is one of the factors responsible for the spread of diseases such as diarrhea, typhoid, scabies, cholera and malaria. More so, it immensely affects the value of property (it decreases the value of property in those areas compared to those areas where flooding is minimal). Flood disasters in Nigeria can be mainly attributed to anthropogenic causes which are being aggravated by poor urban planning and inadequate environmental infrastructure. The nonexistence of Flood Risk Management (FRM) strategy or all-inclusive flood risk maps in the country, for instance, is evidence that flooding issues are poorly attended to (Oladokun and Proverbs, 2016). For instance, a location with a minimal basic infrastructure, unplanned growth and rapid urbanization in addition with the effects of climate change means heavy rainfall could bring about flooding (Baker, 2012). Whenever the problem of flooding occurs, many homes especially those that are susceptible to flooding are swamped and properties worth millions of naira are often destroyed and sometimes human lives are involved as the flood

tide sweep away everything on its path thereby leaving residents to recount their losses (Ayedun, et al, 2018). Flooding which is one of the frequently occurring disasters in Nigeria is often in the form of river floods, flash floods, urban floods or coastal floods (Collins and Sampson, 2007). In the history of flooding in Nigeria, the severest case occurred between July and October 2012 when 363 persons lost their lives, 2.1 million persons across ten states were displaced and 18,282 were injured (NEMA, 2012). Ayedun, et al (2018) stated that flood do occur as a result of heavy rains, dam breakage and blockage of the channels and when soil and vegetation cannot absorb all the water, the excess water then runs off the land in quantities that cannot be carried in streams, channels or retained in natural ponds and constructed reservoirs such as dams. However, between September and October 2012, the torrential rainfall hit the entire low land areas of Nigeria resulting in flooding along most rivers and streams in the country, which were very devastated (Al-Amin, 2013). This historic flooding has increased awareness of flood hazards in Nigeria, especially those living within the flood prone areas (Egbenta, Udo and Otegbulu, 2015).

1.2 Statement of the Problem

Flooding has become a recurrent environmental challenge affecting urban areas worldwide, leading to significant socio-economic and infrastructural consequences. In Ilorin East, Kwara State, particularly in Aduralere, the impact of flooding on residential property value has been a growing concern. The area has experienced periodic flooding due to poor drainage systems, rapid urbanization, and climate change-induced extreme weather conditions. These factors contribute to property damage, increased maintenance costs, and declining real estate investment in the affected areas.

The depreciation of residential property value in flood-prone areas has far-reaching economic and social implications. Property owners often experience financial losses due to reduced market demand, while potential investors are discouraged from acquiring real estate in such locations. Additionally, recurring floods pose health hazards, displacement of residents, and infrastructural decay, further worsening the living conditions and economic viability of the region.

Despite efforts by government agencies and urban planners to mitigate the effects of flooding, property devaluation remains a persistent issue. Understanding the extent to which flooding

influences residential property values in Aduralere is crucial for developing sustainable urban management strategies, effective flood control measures, and informed real estate investment decisions.

1.3 Research Questions

1. What are the major causes of flooding in Aduralere, Ilorin East, Kwara State?
2. Does flooding influence real estate investment decisions in the affected area?
3. What are the direct and indirect effects of flooding on residential property values in Aduralere?

1.4 Research Hypothesis

H_0: There are no significant causes of flooding in Aduralere, Ilorin East, Kwara State.
H_1: Poor drainage systems, rapid urbanization, and climate change are significant causes of flooding in Aduralere, Ilorin East, Kwara State.

H_0: Flooding does not influence real estate investment decisions in the affected area.
H_1: Flooding negatively impacts real estate investment decisions in Aduralere by reducing investor confidence and property demand.

H_0: Flooding has no significant direct or indirect effects on residential property values in Aduralere.

H_1: Flooding significantly reduces residential property values through direct damages and indirect consequences such as increased maintenance costs and reduced market demand.

1.5 Aims and Objectives

1.5.1 Aim

The primary aim of this study is to assess the impact of flooding on residential property values in Aduralere, Ilorin East, Kwara State, by identifying the causes of flooding, its influence on real estate investment, and its direct and indirect effects on property values.

1.5.2 Objectives

1. To identify the major causes of flooding in Aduralere, Ilorin East, Kwara State, and analyze their contributing factors.
2. To examine the extent to which flooding influences real estate investment decisions in the affected area.
3. To evaluate the direct and indirect effects of flooding on residential property values in Aduralere.

1.6 Justification of the Study

Flooding poses a significant challenge to urban development, particularly in Aduralere, Ilorin East, Kwara State. This study is essential in understanding the causes of flooding in the area and how factors such as poor drainage systems, rapid urbanization, and climate change contribute to recurrent flood incidents. By examining the relationship between flooding and real estate investment, the research will provide insights into how flooding affects property demand, investor confidence, and overall market trends.

Furthermore, the study is crucial in assessing the financial and economic implications of flooding on residential property values. Homeowners often experience property depreciation, high maintenance costs, and reduced rental income due to recurrent flooding. Understanding these impacts will help in developing strategies to minimize financial losses and ensure better property management.

The study also holds significance for urban planning and policy development. The findings will aid government agencies, urban planners, and policymakers in designing effective flood control measures, improving zoning regulations, and implementing disaster management strategies. Creating awareness among property owners, residents, and stakeholders about the risks of flooding and the importance of proactive mitigation efforts will further contribute to sustainable urban development. By addressing these concerns, this research will provide valuable recommendations for enhancing real estate investment resilience and improving environmental planning in Aduralere and similar flood-prone areas.

1.7 Scope of the Study

This study focuses on the effect of flooding on residential property values in Aduralere, Ilorin East, Kwara State. The research aims to analyze the causes, frequency, and severity of flooding in the area, as well as its impact on property values and real estate investment trends.

The study will utilize both primary and secondary data sources. Primary data will be collected through surveys and interviews with property owners, real estate agents, and local government officials to gather firsthand information on the impact of flooding. Secondary data will include historical records on flooding patterns, property valuation reports, and relevant urban planning policies.

This research is geographically limited to Aduralere, as it is one of the most flood-prone areas within Ilorin East, making it a suitable case study for examining the relationship between environmental hazards and real estate devaluation. By narrowing the scope to this location, the study aims to provide precise and actionable insights that can inform policymakers, urban planners, and investors about strategies for mitigating flood-related property depreciation and promoting sustainable urban development.

Additionally, the study will assess the economic and financial implications of flooding on property values, exploring how recurrent floods influence homeowner decisions, property maintenance costs, and long-term real estate viability. The research will also evaluate existing flood control measures and recommend effective strategies to minimize the adverse effects of flooding on residential property values.

1.8 Study Area

Geographical Setting

Aduralere is a residential neighborhood located in Ilorin East Local Government Area of Kwara State, Nigeria. The area is characterized by a mix of urban and semi-urban developments, with a growing population and increasing commercial activities. The terrain is relatively low-lying, making it prone to water accumulation and frequent flooding, particularly during the rainy

season. The climate of Aduralere falls within the tropical savanna zone, experiencing distinct wet and dry seasons, which significantly influence flooding patterns. Poor drainage systems and uncontrolled urbanization have further exacerbated the flooding challenges in the area.

Historical Background

Ilorin, the capital of Kwara State, has a rich historical background as a major center of trade, religion, and culture. Aduralere, like many parts of Ilorin, has experienced significant urban growth over the years, transitioning from a predominantly agrarian community to a developing urban hub. The expansion of residential areas, coupled with inadequate infrastructural planning, has contributed to persistent environmental challenges, including flooding. The rapid increase in population and commercial activities has led to encroachments on natural waterways, further compounding the flood risks. Understanding the historical development of Aduralere helps in contextualizing the current flood-related issues and their impact on residential property values.

Construction Details

The residential buildings in Aduralere vary in structure, with a mix of modern and traditional housing designs. Many houses are constructed with reinforced concrete, while others still rely on mud bricks or substandard materials, making them vulnerable to flood damage. Poorly planned drainage systems and unregulated building constructions contribute to the severity of flooding impacts. The study will examine the structural integrity of buildings in relation to flood resilience and how construction practices affect property values in the area.

By analyzing the geographical, historical, and construction-related factors of Aduralere, this research aims to provide a well-rounded understanding of the flooding problem and its impact on residential property values.

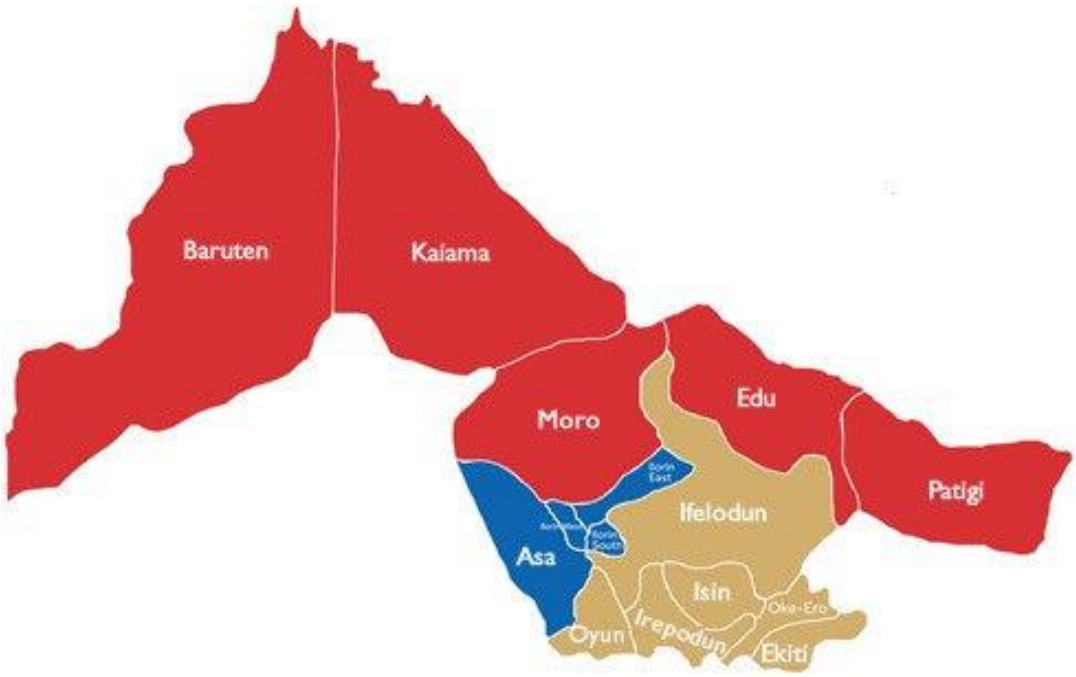

Fig 1.0: showing the study location

Source: Google earth 2020

1.9 Definition of terms

Flooding:

The overflow of water onto land that is typically dry, often caused by heavy rainfall, inadequate drainage systems, or rising water levels in rivers, lakes, or oceans (United States Geological Survey 2021).

Residential Property: Real estate used for housing purposes, including single-family homes, apartments, and other types of dwellings meant for residential living (Oxford English Dictionary 2023).

Drainage Infrastructure: Systems and structures, such as sewers and canals, designed to manage surface water and prevent flooding by channeling excess water away from urban areas (Oxford English Dictionary 2023).

Mitigation: Efforts and actions taken to reduce the severity, frequency, or impact of flooding on communities and infrastructure (Oxford English Dictionary 2023).

Economic Impact: The financial consequences of flooding, including damage to property, loss of income, and increased costs for repairs and recovery (Oxford English Dictionary 2023).

Catchment Area: The geographic area from which water flows into a particular water body, such as a river, lake, or drainage system (United Nations Environment Programme 2015).

Flood-Prone Areas: Locations or regions that are particularly susceptible to flooding due to natural or man-made factors, such as topography, inadequate drainage, or poor urban planning (United Nations Environment Programme2015).

Sustainability: Practices and policies aimed at meeting present needs without compromising the ability of future generations to meet their own needs, often involving environmentally friendly approaches (Brundtland Commission 1987).

CHAPTER TWO

2.0 Introduction

This chapter provides a comprehensive review of existing literature review related to the effect of flooding on residential property value, focusing on the various concepts, theoretical framework that have explored this relationship. The review aims to establish a theoretical foundation for the study by examining previous research, identifying key concepts, and understanding the key factors that influence flooding. This literature review will help contextualize the study within broader research trends and theories, guiding the analysis and interpretation of findings in later chapters.

2.1 Literature Review

A review of existing literature reveals that flooding is driven by various factors, including poor drainage systems, rapid urbanization, climate change, and inadequate waste management. Urban expansion without proper infrastructural planning increases vulnerability to flooding. Studies emphasize the role of extreme weather events and rising water levels in exacerbating flood risks. Research has shown a significant correlation between frequent flooding and declining property values, with properties in flood-prone areas experiencing lower demand, reduced market prices, and increased maintenance costs. The depreciation of residential properties due to flood damage leads to long-term financial burdens for homeowners and discourages real estate investment in affected areas.

Flooding influences investors' confidence in the real estate market. Investors tend to avoid high-risk areas or demand lower prices for properties located in flood-prone regions. The implementation of flood mitigation measures, such as improved drainage infrastructure and government policies, can have a positive effect on investor decisions. The role of tax contributions in mitigating flooding and promoting economic stability has been widely examined. Government investment in flood prevention infrastructure, funded through property and environmental taxes, plays a critical role in reducing flood risks. Taxation policies aimed at funding disaster management initiatives contribute to economic resilience and long-term property value stability.

By reviewing literature in alignment with these objectives and variables, this study establishes a clear understanding of the relationship between flooding, property values, and economic growth. The findings provide insights into effective strategies for mitigating flood-related depreciation and guiding investment decisions in flood-prone areas.

2.1.1 Conceptual Framework

2.1.1.1Concept of Flooding

A flood is an excess of water (or mud) on land that's normally dry and is a situation wherein the inundation is caused by high flow, or overflow of water in an established watercourse, such as a river, stream, or drainage ditch; or ponding of water at or near the point where the rain fell. This is a duration type event. A flood can strike anywhere without warning, occurs when a large volume of rain falls within a short time.

Flood, according to Smith (2009) can be defined as an unusual accumulation of water above the ground which is caused by high tides, heavy rainfall, or rapid run-off from paved surfaces. However, some rivers are known to have natural flood plains which occur along coastal areas. In these areas, heavy rainfall and poor soil combine to cause flooding. Ologunorisa (2004) defined flood as any overland flow sufficient enough to cause significant property damage, traffic obstruction, nuisance and health hazards which include river flood, flash flood and their damages. Flood is an overflowing or irruption of a great body of water over land not usually submerged (Oxford English Dictionary). It is an extreme weather event naturally caused by rising global temperature which results in heavy downpour, thermal expansion of the ocean and glacier melt, which in turn result in rise in sea level, thereby causing salt water to inundate coastal lands. Flooding is the most common of all environmental hazards and it regularly claims over 20,000 lives per year and adversely affects around 75 million people worldwide (Smith, 1996).

Flooding may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levees, with the result that some of the water escapes its usual boundaries. Floods can also occur in rivers, when flow exceeds the capacity of the river channel, particularly at bends or meanders. Floods often cause damage to homes and businesses if they are placed in natural flood plains of rivers. While flood damage can be virtually eliminated by moving away from rivers and other bodies of water, since time out of mind, people have lived

and worked by the water to seek sustenance and capitalize on the gains of cheap and easy travel and commerce by being near water.

Flood is an overflowing or irruption of a great body of water over land not usually submerged (Oxford English Dictionary). It is an extreme weather event naturally caused by rising global temperature which results in heavy downpour, thermal expansion of the ocean and glacier melt, which in turn result in rise in sea level, thereby causing salt water to inundate coastal lands. Flooding is the most common of all environmental hazards and it regularly claims over 20,000 lives per year and adversely affects around 75 million people world-wide (Smith, 1996). Flooding can be described as high water stage in which water overflows its natural or artificial banks on the normally dry land, such as stream or river inundating its adjacent lowlands.

Flood is a large amount of water covering an area that is usually dry. It is an overflowing of a great body of water over land not usually submerged. Nwafor (2006) defined flood as a natural hazard like drought and desertification which occurs as an extreme hydrological event. On the other hand, Abam (2006), defined flood as large volume of water which arrives at and occupy the stream channel and its flood plain in a time too short to prevent damage to economic activities including homes. Floods occur in Nigeria in three main forms: coastal flooding, river flooding and urban flooding (Folorunsho and Awosika 2001). They noted that coastal flooding occurs in the low-lying belt of mangrove and fresh water swamps along the coast. River flooding occurs in the flood plains of the larger rivers, while sudden, short-lived flash floods are associated with rivers in the inland areas where sudden heavy rains can change them into destructive torrents within a short period. Urban flooding on the other hand occurs in towns, on flat or low-lying terrain especially where little or no provision has been made for surface drainage, or where existing drainage has been blocked with municipal waste, refuses and eroded soil sediments (Olagunorisa, 2004). Floods are the most common and widespread of all the natural hazards. In many parts of the world according to Ocheri and Okeke (2012) floods seem to be occurring more often and they seem to be increasing in size. Floods are generally regarded as extreme hydrological events, where there is excess of water which may have devastating effects. According to Aderogba (2012), floods in tropics are partly or wholly climatological in nature, that is, they result from torrential rainfall.

Mathur, et al (2010) have adopted the definition of flood as: “a rising and overflowing of a water body onto a normally dryland”. It is an overflow of an expanse of water that submerges land

which is normally not submerged. It usually occurs when volume of water exceeds in a water body, such as river, or lake, and results in water flow. The occurrence (which) takes places in the aftermath of meteorological events. Adetunji&Oyeleye (2013) quoting Kates (1985), similarly defined floods as an overflow of an expanse of water that submerges land. So flooding occurs when rivers, streams, ponds, dams overflow their natural banks and cover floodplains and areas extending outside floodplains. Floods are therefore the inundation of land by water, this is normally temporary in nature, but can the re-occurring as many areas/regions experience seasonal and even annual flooding (the Niger Delta Region, for example). Areas most at risk to floods are floodplains, low lying areas, coastal regions and other areas like cities where human activities accentuates flooding episodes.

Flood is a natural process which occurs when water inundates land that is ordinarily dry. When rain falls on an area of land (catchment), some of the water percolate into the soil while the left-over flows downhill as runoff and the amount of this runoff depends largely on the nature of the catchment. Floods therefore occur when the amount of water from the catchment far exceeds the capacity of the drain channels available. The intensity of rainfall, thecatchment and the drains are therefore major contributory factors to flooding. Flooding is a major environmental phenomenon creating severe impacts on the socio-economic and environmental aspects of human endeavour. It is prominent in highly built-up and low-lying areas especially where little or no attention was paid to proper planning in the development of infrastructures.

2.1.1.2 Concept of Property value

Principal Types and Causes of Flood

When it rains, some of the water is retained by the soil, some is absorbed by vegetation, some evaporates, and the remainder, which reaches stream channels, is called runoff. Flood occurwhen soil and vegetation cannot absorb all the water; water then runs off the land in quantities

that cannot be carried in stream channels or retained in natural ponds and constructed reservoirs. A flood that rises and falls rapidly with little or no advance warning is called flash flood. Flash floods usually result from intense rainfall over a relatively small area.

Some principal types of flood and their causes are listed below.

- **Riverine:** The slow kinds of Riverine floods are as a result of runoff from sustained rainfall exceeding the capacity of a river's channel, while the fast kinds of Riverine floods include flash floods resulting from convective precipitation or sudden release froman upstream impoundment created behind a dam, landslide, or glacier. The causes of Riverine Floods include heavy rains from monsoons, hurricanes and tropical depressions. Unexpected drainage obstructions such as landslide or debris can cause slow flooding upstream of the obstruction
- **Estuarine:** Commonly caused by a combination of sea tidal surges caused by storm-force winds. A storm surge, from either a tropical cyclone or an extratropical cyclone, falls within this category.
- **Coastal:** Caused by severe sea storms, or as a result of another hazard (e.g. tsunami or hurricane). A storm surge, from either a tropical cyclone or an extratropical cyclone, fallswithin this category.
- **Catastrophic:** Caused by a significant and unexpected event e.g. dam breakage, or as a result of another hazard (e.g. earthquake or volcanic eruption).
- **Human-Induced:** Accidental damage by workmen to tunnels or pipes.

- **Muddy:** A muddy flood is produced by an accumulation of runoff generated on cropland.

Sediments are then detached by runoff and carried as suspended matter or bed load. Muddy runoff is more likely detected when it reaches inhabited areas. Muddy floods are therefore a hill slope process, and confusion with mudflows produced by mass movements should be avoided.

- **Other:** Flood can occur if water accumulates an impermeable surface (e.g. from rainfall) and cannot rapidly dissipate (i.e. gentle orientation or low evaporation). Dam building beavers can flood low-lying urban and rural areas, often causing significant damage.

2.1.2 Theoretical Framework

2.1.2.1 Economic Theory of Property Value

The Economic Theory of Property Value suggests that the price of residential properties is determined by a variety of factors, one of which is the risk of environmental hazards, such as flooding. According to the hedonic pricing model, property prices are a reflection of the aggregate value of individual characteristics that contribute to the desirability of the property. These characteristics include both physical attributes (e.g., square footage, amenities) and locational factors (e.g., proximity to schools, parks, or flood-prone areas). When properties are situated in areas at risk of flooding, this environmental risk becomes a significant negative characteristic, potentially lowering the perceived value of the property.

Flooding introduces externalities that affect not just the property at risk but the surrounding area as well. Flood-prone locations tend to face a decline in property values because buyers are cautious of the potential for property damage, increased insurance premiums, and the possibility of higher maintenance costs. The cost associated with flood risk can also include the psychological impact, as potential buyers might worry about the long-term implications of flooding, such as the potential for displacement or loss of property value after a disaster. This creates what can be understood as a "flood risk discount," where homes in flood zones may be priced lower compared to comparable properties in safer locations.

Furthermore, the concept of the "risk premium" is central to this framework. Buyers may demand a lower price to compensate for the perceived risk of flooding, or they may require a higher rate of return on their investment to offset the additional risks involved in purchasing a property located in a flood-prone area. In markets where flooding risks are not immediately obvious, such as areas that have not recently experienced a flood, property values may be less affected, but as flood events increase in frequency or intensity, the price discount may become more pronounced.

Additionally, the availability of flood insurance and government policies aimed at flood risk management play a role in shaping the market value of residential properties. Properties that are located in areas with higher insurance premiums or where flood protection measures are

inadequate may experience more significant depreciation in value, as potential buyers factor in the cost and difficulty of obtaining affordable insurance. Over time, the combination of market forces, risk perception, and governmental regulations can lead to a shift in the economic value of properties in flood-prone areas.

2.1.2.2 Urban Planning and Land Use Theory

Urban Planning and Land Use Theory addresses the spatial organization of human settlements, focusing on how land is allocated, developed, and managed within cities and regions. It examines how land use regulations, zoning laws, and urban design influence property values, particularly when considering environmental risks like flooding.

One key element of Urban Planning and Land Use Theory is **location theory**, which emphasizes that the value of a property is significantly influenced by its geographical position and the surrounding land uses. In flood-prone areas, the location of a property in relation to floodplains, rivers, or coastlines can substantially affect its value. Properties that are near flood-prone areas might experience lower demand due to the perceived risk of flooding. In contrast, properties located in more protected areas or higher ground may have greater appeal, leading to higher values. However, urban planners can influence the value of properties in flood-prone areas through the use of planning and zoning regulations.

Zoning laws play an important role in this context, as they regulate the types of activities allowed on particular parcels of land. Flood zones are typically designated within land use planning, with specific restrictions placed on development in high-risk areas. These regulations can significantly affect property values, as land that is zoned for residential use in flood-prone areas may face restrictions on building height, construction materials, or development density. These limitations often result in higher construction costs or the need for additional flood mitigation measures (e.g., raising foundations, building levees), which can lower the value of the property. Conversely, properties in areas where flood risk is managed through comprehensive flood control infrastructure may experience stable or even increased property values.

In addition to zoning, **building codes** are a crucial tool in flood-prone areas, specifying design and construction standards to mitigate flood risks. Communities in flood-prone areas may adopt

building codes that require elevated structures, flood-resistant materials, or flood barriers. These regulations can help reduce the overall damage during flood events, preserving the value of the property. In some cases, these building standards may add to the cost of construction, which could impact initial property values. However, they may also provide a long-term benefit by reducing the likelihood of flood damage, thus stabilizing property values over time.

Another aspect of this theory is the **investment in flood mitigation infrastructure**. Urban planners play a critical role in deciding where and how to invest in flood protection measures, such as levees, dams, stormwater management systems, or flood diversion channels. These investments help reduce the overall risk of flooding, which in turn can mitigate the negative impact on property values. Properties in areas where effective flood management infrastructure is in place may not only hold their value better but could even experience increases in demand as buyers perceive them to be less vulnerable to flooding.

Lastly, **land use decisions** made by municipalities can influence the long-term trajectory of property values in flood-prone areas. If flood risks are not adequately considered in land use decisions, or if flood management is neglected, the effects on property values can be severe. However, when urban planners take a proactive approach by designing cities to minimize flood risks through smart zoning, infrastructure investment, and environmental planning, the value of residential properties can be protected or even enhanced over time.

2.2 Summary of Literature Review

Section	Summary
Introduction	The chapter reviews existing literature on the effect of flooding on residential property values. It aims to establish a theoretical foundation for the study by examining previous research and identifying key factors influencing flooding and property values.
2.1 Literature Review	Flooding is influenced by factors such as poor drainage, urbanization, climate change, and waste management. Studies show a correlation between frequent flooding and declining property values due to reduced demand, higher maintenance costs, and financial burdens. The role of investors' confidence and the effect of flood mitigation measures like improved drainage infrastructure and government policies on property values are emphasized.
2.1.1 Conceptual Framework	**2.1.1.1 Concept of Flooding**: Flooding is the overflow of water on land not usually submerged, resulting from high flow, heavy rainfall, or rapid

	runoff. It can occur due to climatic events like rising temperatures, sea levels, and heavy rains. Floods cause damage to property, and in urban areas, inadequate drainage systems exacerbate the problem. Types of floods include riverine, estuarine, coastal, catastrophic, human-induced, and muddy floods.
2.1.1.2 Concept of Property Value	Property value is influenced by various factors, including environmental risks like flooding. Floods impact property value due to reduced demand, higher insurance costs, and long-term depreciation due to potential flood damage.
2.1.2 Theoretical Framework	**2.1.2.1 Economic Theory of Property Value**: The price of residential properties is affected by environmental hazards like flooding. The hedonic pricing model suggests that property prices reflect both physical attributes and environmental risk factors. Flood risk can lower property values, creating a "flood risk discount." The risk premium and availability of flood insurance also influence property values.
2.1.2.2 Urban Planning and Land Use Theory	Urban planning and land use influence property values, especially in flood-prone areas. Location, zoning laws, and flood mitigation infrastructure play a key role. Properties in flood-prone areas face lower demand, while those in safer locations may have higher values. Urban planners can manage flood risks through zoning regulations, building codes, and investment in flood management infrastructure, which can stabilize or increase property values in the long term.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the methodology adopted in carrying out the research. It describes the research design, data types and sources, the instruments used for data collection, the target population, sampling techniques, and the methods of data analysis. The purpose is to ensure the research findings are valid, reliable, and applicable to real-world conditions in Aduralere, Ilorin East LGA.

3.1 Research Design

This study adopts a **descriptive survey research design**. This design is appropriate as it allows for systematic collection and analysis of data regarding the impact of flooding on residential property values. It also facilitates the use of both quantitative and qualitative data to understand the extent, pattern, and perception of flooding and property value changes in the study area.

3.2 Data Types and Sources

The research relies on both primary and secondary sources of data. Primary data are generated directly from the field through the administration of structured questionnaires and interviews conducted with residents, estate valuers, and community leaders in the Aduralere area. These instruments are designed to capture first-hand information on the effects of flooding on residential properties, residents' experiences, and expert opinions on property valuation changes linked to flood exposure.

Secondary data, on the other hand, are obtained from existing records and published materials. These include government documents, property valuation records, prior research studies, academic journal articles, and official reports from the Kwara State Ministry of Environment and Urban Planning. These sources provide historical data on flooding incidents, trends in property values, and existing policies related to urban planning and environmental management within the study area. Combining both data types ensures a comprehensive understanding of the subject matter.

3.3 Instrument for Data Collection

Data for this research were collected using a combination of structured questionnaires, key informant interviews, and direct field observations. The structured questionnaires were administered to residents and real estate professionals within Aduralere to gather quantitative data on the impact of flooding on residential property values. These questionnaires incorporated both close-ended and open-ended questions, allowing respondents to provide specific answers while also offering detailed insights based on personal experiences.

In addition to questionnaires, key informant interviews were conducted with community leaders and relevant government officials to obtain in-depth qualitative information on historical

flooding patterns, local mitigation efforts, and perceptions of property value fluctuations in the area. Furthermore, field observations were carried out using GPS technology to identify and document flood-prone zones, drainage conditions, and the physical state of affected properties. This multi-instrument approach ensured the collection of rich, reliable data that reflect both numerical trends and contextual realities within the study area.

3.4 Target Population

The target population for this study comprises individuals and groups directly or indirectly impacted by flooding in Aduralere, Ilorin East Local Government Area. This includes residents who have experienced flooding and its consequences on their homes and property values. Additionally, the population extends to real estate practitioners and valuers operating within Kwara State, as they possess professional insights into how flooding influences market trends and property valuation. Also included are relevant government agencies responsible for property registration, land use planning, and environmental management, whose policies and data provide essential context and support for understanding the broader implications of flooding on residential property values in the study area.

3.5 Sample Frame

The sample frame for this research is drawn from multiple relevant and verifiable sources within the study area. It includes a comprehensive list of households and residential buildings that have been identified as affected by previous flooding incidents in Aduralere. This list serves as the foundation for selecting respondents who have firsthand experience with the impact of flooding on property values. Additionally, the sample frame includes registered estate surveyors and valuers operating within Ilorin East Local Government Area, who are key stakeholders in the real estate market and provide professional assessments on property valuation. Supplementary data from local government records and environmental monitoring agencies are also incorporated to ensure the inclusion of accurate, up-to-date information about flood-prone zones and infrastructural conditions influencing property markets in the area.

3.6 Sample Size

The study will engage a total of 150 respondents, representing a cross-section of stakeholders directly or indirectly affected by flooding in Aduralere. Among them are 100 household residents living in flood-prone areas, whose insights reflect the experiential and economic impact of flooding on residential properties. Additionally, 30 real estate practitioners will be consulted for their professional perspectives on valuation trends and market behavior in affected zones. The sample also includes 20 government or community stakeholders who play key roles in urban planning, environmental regulation, and disaster response. The sample size was determined using Cochran’s formula for finite populations, taking into account practical considerations such as respondent accessibility and expected response rates to ensure data reliability and representativeness.

3.7 Sampling Procedure

The study adopts a stratified random sampling approach to ensure comprehensive coverage of the study area. Aduralere will be categorized into different strata based on the severity of flooding experienced—ranging from high-risk to low-risk zones. Within each of these strata, respondents will be randomly selected to ensure proportional representation of households across the varying degrees of flood exposure. In addition, purposive sampling will be employed to select key informants such as community leaders, government officials, and real estate professionals, given their specialized knowledge and relevance to the study objectives. This mixed sampling approach enhances both the inclusivity and depth of the data collected.

3.8 Method of Data Analysis

The data obtained will be analyzed using both quantitative and qualitative techniques. Descriptive statistics such as means, frequencies, and percentages will be employed to present the general characteristics of the respondents and summarize their responses. To explore the relationship between flood exposure and residential property values, inferential statistical tools including correlation and regression analysis will be applied. Geographic Information System (GIS) mapping will also be utilized to spatially represent flood-prone zones and their impact on residential properties across Aduralere. For qualitative data obtained from interviews with key informants, thematic analysis will be conducted to identify recurring patterns, insights, and stakeholder perspectives on the issue.

3.9 Summary of Data Analysis for Each Objective

The table below presents a summary of the data analysis methods tailored to each specific research objective:

S/N	Research Objective	Method of Data Analysis
1	To identify the major causes of flooding in Aduralere, Ilorin East, Kwara State, and analyze their contributing factors.	Descriptive statistics such as frequency and percentage distributions will be used to summarize respondents' views, while thematic analysis will interpret qualitative responses.
2	To examine the extent to which flooding influences real estate investment decisions in the affected area.	Cross-tabulation and Chi-square tests will be employed to assess associations, while regression analysis will determine the influence of flooding on investment choices.
3	To evaluate the direct and indirect effects of flooding on residential property values in Aduralere.	Regression analysis will be used to assess the impact of flood frequency/severity on property value changes, supported by GIS mapping for spatial interpretation.

This approach ensures a comprehensive understanding of the flood-related challenges affecting residential property values in the study area.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents, analyzes, and interprets the data collected through the structured questionnaire administered to residents of Aduralere, Ilorin East Local Government Area, Kwara State. The main purpose is to assess the perception and impact of flooding on residential property values in the area. Data are categorized into two sections: demographic information and flooding-related variables. Frequencies, percentages, and cumulative percentages are used in presenting the results, followed by a detailed interpretation and discussion of findings in relation to the research objectives.

4.1 Data Presentation, Analysis and Interpretation of Results

Section A: Demographic Information

Table 4.1.1: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)	Cumulative (%)
Male	40	50.0	50.0
Female	40	50.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: The respondents were evenly distributed between males and females, with each gender accounting for 50% of the total respondents. This indicates a balanced gender representation in the study.

Table 4.1.2: Age Group of Respondents

Age Group	Frequency	Percentage (%)	Cumulative (%)
18–25	12	15.0	15.0
26–35	22	27.5	42.5
36–45	18	22.5	65.0

46–55	16	20.0	85.0
56 and above	12	15.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: The majority of respondents fall within the 26–35 age group, indicating that most property owners or occupants in Aduralere are relatively young adults.

Table 4.1.3: Occupation of Respondents

Occupation	Frequency	Percentage (%)	Cumulative (%)
Civil servant	20	25.0	25.0
Private sector worker	18	22.5	47.5
Trader/Business owner	15	18.75	66.25
Artisan	10	12.5	78.75
Unemployed	9	11.25	90.0
Others	8	10.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: Civil servants and private sector workers make up a significant portion of the population, implying a stable economic base, which may influence perceptions of property value and risk mitigation behavior.

Table 4.1.4: Duration of Stay in Aduralere

Duration	Frequency	Percentage (%)	Cumulative (%)
Less than 1 year	5	6.25	6.25
1–5 years	20	25.0	31.25
6–10 years	25	31.25	62.5
Over 10 years	30	37.5	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: Most respondents have lived in the area for over 10 years, indicating they are likely to have extensive experience with flooding in Aduralere and are well-positioned to assess its impact.

Question 5: How frequently does flooding occur in your area?

Table 4.2.1: Frequency of Flooding in Aduralere

Response Option	Frequency	Percentage (%)	Cumulative (%)
Never	4	5.0	5.0
Rarely	8	10.0	15.0
Occasionally	20	25.0	40.0
Frequently	26	32.5	72.5
Every rainy season	22	27.5	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: A total of 60% of respondents reported that flooding occurs either **frequently** or during **every rainy season**, showing that flooding is a recurring issue in Aduralere. Only a small portion (15%) indicated that flooding occurs rarely or never. This suggests that flooding is a common and significant environmental concern in the area, likely affecting property values and living conditions.

Question 6: What is the major cause of flooding in Aduralere?

Table 4.2.2: Respondents' Perception of Major Causes of Flooding

Response Option	Frequency	Percentage (%)	Cumulative (%)
Poor drainage system	30	37.5	37.5
Overflowing rivers/streams	8	10.0	47.5
Blocked water channels	20	25.0	72.5
Heavy rainfall	18	22.5	95.0
Other (please specify)	4	5.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: The most commonly cited cause of flooding in Aduralere is a poor drainage system (37.5%), followed by blocked water channels (25.0%) and heavy rainfall (22.5%). This suggests that both natural and human-made factors contribute to the flooding problem. Addressing infrastructural deficits, especially in drainage, could significantly mitigate flood occurrences in the area.

Question 7: Have you ever experienced damage to your property due to flooding?

Table 4.2.3: Property Damage Experience Due to Flooding

Response Option	Frequency	Percentage (%)	Cumulative (%)
Yes	52	65.0	65.0
No	28	35.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: A significant majority of respondents (65%) reported experiencing property damage as a result of flooding. This underscores the serious impact of flooding on residential properties in Aduralere and highlights the need for preventive measures and improved urban planning to protect assets and reduce financial losses.

Question 8: If yes, what type of damage did your property sustain? *(Note: This question applies only to the 52 respondents who answered "Yes" to Question 7)*

Table 4.2.4: Major Type of Property Damage Sustained Due to Flooding

Type of Damage	Frequency	Percentage (%)	Cumulative (%)
Structural damage (walls, foundation)	18	34.6	34.6
Interior damage (furniture, appliances)	12	23.1	57.7
Electrical/water systems	10	19.2	76.9
Fence/gates	8	15.4	92.3
Others	4	7.7	100.0
Total (from 52 valid responses)	**52**	**100.0**	

Source: Field Survey 2025

Analysis: Among those who experienced flood damage, structural damage was the most frequently reported type (34.6%), followed by interior damage (23.1%) and damage to electrical/water systems (19.2%). These findings highlight the severity of flooding's impact on the integrity and functionality of residential buildings in Aduralere.

Question 9: In your opinion, does flooding reduce the value of residential property in this area?

Table 4.2.5: Respondents' Opinion on Flooding and Property Value

Response Option	Frequency	Percentage (%)	Cumulative (%)
Strongly Agree	34	42.5	42.5
Agree	26	32.5	75.0
Neutral	8	10.0	85.0
Disagree	7	8.75	93.75
Strongly Disagree	5	6.25	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: A significant **75%** of respondents either agree or strongly agree that flooding reduces residential property values in Aduralere. This suggests that the majority of residents recognize a negative relationship between flooding and property worth. Only a small portion (15%) disagreed or strongly disagreed, indicating a strong general consensus on the adverse economic impact of flooding on real estate.

Question 10: Have you considered relocating due to flooding?

Table 4.2.6: Consideration of Relocation Due to Flooding

Response Option	Frequency	Percentage (%)	Cumulative (%)
Yes	38	47.5	47.5
No	30	37.5	85.0
Not sure	12	15.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: Nearly half of the respondents (47.5%) have considered relocating due to the effects of flooding, while 37.5% said they have not. The remaining 15% are undecided. This indicates a significant level of dissatisfaction or concern among residents regarding living conditions in

flood-prone areas. Such responses reflect the long-term socioeconomic and emotional toll that flooding imposes on residents.

Question 11: Are tenants and buyers less willing to rent or buy property in this area because of flooding?

Table 4.2.7: Perception of Buyer/Tenant Willingness Due to Flooding

Response Option	Frequency	Percentage (%)	Cumulative (%)
Strongly Agree	30	37.5	37.5
Agree	28	35.0	72.5
Neutral	10	12.5	85.0
Disagree	8	10.0	95.0
Strongly Disagree	4	5.0	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: A combined **72.5%** of respondents believe that flooding discourages potential tenants and buyers from renting or purchasing property in the area. Only **15%** disagree or strongly disagree with this notion. This result shows that flooding not only impacts current property owners but also affects the broader real estate market in Aduralere by diminishing demand and desirability.

Question 12: Do you think properties in flood-prone areas are cheaper compared to non-flooded areas in Ilorin?

Table 4.2.8: Perception on Property Prices in Flood-Prone Areas

Response Option	Frequency	Percentage (%)	Cumulative (%)
Yes	45	56.25	56.25
No	22	27.5	83.75
Not sure	13	16.25	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: More than half of the respondents (56.25%) believe that properties in flood-prone areas are cheaper than those in non-flooded areas in Ilorin, while 27.5% disagree. This

perception aligns with the expected market dynamics where risks associated with flooding reduce property values. A notable portion (16.25%) remains uncertain, possibly due to lack of clear information or market transparency.

Question 13: How has flooding affected your property's rental or resale value?

Table 4.2.9: Effect of Flooding on Property Rental or Resale Value

Response Option	Frequency	Percentage (%)	Cumulative (%)
Greatly Decreased	35	43.75	43.75
Slightly Decreased	25	31.25	75.0
No Change	12	15.0	90.0
Slightly Increased	5	6.25	96.25
Greatly Increased	3	3.75	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: A majority of respondents (75%) indicated that flooding has either **greatly** or **slightly decreased** their property's rental or resale value, confirming the negative economic impact of flooding. Only a small minority reported no change or an increase in value, which may be due to individual circumstances or properties less affected by flooding.

Question 14: Have you made any adjustments or improvements to reduce flood impact on your property?

Table 4.2.10: Adjustments or Improvements Made to Reduce Flood Impact

Response Option	Frequency	Percentage (%)	Cumulative (%)
Yes	28	35.0	35.0
No	38	47.5	82.5
Planning to	14	17.5	100.0
Total	**80**	**100.0**	

Source: Field Survey 2025

Analysis: Only 35% of respondents have made adjustments or improvements to their properties to reduce flood impact, while nearly half (47.5%) have not taken any measures. A notable 17.5%

are planning to make improvements. This indicates that while some residents are proactive, many may lack the resources or knowledge to mitigate flooding effects effectively.

4.3 Discussion of Findings

Overall, the findings of this study clearly show that flooding has a **negative impact on residential property values** in Aduralere. The issue is widespread, structurally damaging, economically detrimental, and socially disruptive. The lack of consistent mitigation by residents and the infrastructural failures at the community level call for **urgent governmental intervention, urban planning reforms,** and **awareness campaigns** to manage flood risks and restore property confidence in the area.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the major findings, conclusion drawn from the research, and recommendations based on the data analysis and discussions in the previous chapters. The study aimed to examine the extent to which flooding affects residential property values in Aduralere, Ilorin East LGA, Kwara State. Data was collected through structured questionnaires and analyzed using descriptive statistics. The chapter highlights key insights gained and provides relevant suggestions for policy, planning, and further studies.

5.1 Summary of Findings

From the analysis and interpretation of responses provided by 80 participants, the study revealed the following major findings:

1. **Flooding Occurrence and Causes**
    - A high frequency of flooding is experienced in Aduralere, with most respondents confirming it occurs during every rainy season.
    - The main causes identified include poor drainage systems, blocked water channels, and heavy rainfall.
2. **Damage to Property**
    - A significant portion of respondents reported various types of property damage due to flooding, including structural damage, electrical faults, interior deterioration, and fence collapse.
3. **Impact on Property Value**
    - The majority of respondents strongly believe that flooding decreases the value of residential properties in the area.
    - About 75% indicated that their property's rental or resale value has either slightly or greatly decreased due to flooding.

- Over 70% agreed that buyers and tenants are less willing to invest in the area because of flooding.

4. **Perceptions and Reactions of Residents**
    - Nearly half of the respondents have considered relocating due to flooding.
    - While some residents have taken steps to mitigate flooding impacts on their properties, a large percentage have not, though some are planning to.
5. **Market Trends**
    - Many residents perceive that properties in flood-prone areas are cheaper than those in safer areas of Ilorin, reinforcing the economic devaluation caused by flooding.

5.2 Conclusion

The findings of this study indicate that flooding has a significant and mostly negative impact on the value of residential properties in Aduralere. It affects both physical structures and market desirability, leading to depreciation in property value and a decline in interest from potential buyers or tenants. The recurring nature of flooding, combined with inadequate infrastructure and urban planning, contributes to residents' dissatisfaction and economic losses. Unless proactive steps are taken by both individuals and government agencies, the property market in Aduralere will continue to suffer devaluation and disinvestment.

5.3 Recommendations

Based on the findings and conclusions of this research, the following recommendations are made:

1. **Improved Drainage Infrastructure**
    - Government at the local and state levels should urgently invest in the construction and maintenance of effective drainage systems to prevent frequent flooding.
2. **Urban Planning and Zoning Enforcement**
    - Regulatory agencies should enforce zoning laws and building regulations, especially in flood-prone areas, to reduce vulnerability and improve long-term property sustainability.

3. **Public Awareness Campaigns**
    - Residents should be educated on the causes of flooding and proactive measures to reduce its impact, including proper waste disposal to prevent blocked water channels.
4. **Flood Mitigation Support**
    - Government and NGOs should provide technical and financial support to residents to implement flood-resistant improvements such as raised foundations, drainage upgrades, and use of flood-resistant materials.
5. **Regular Environmental Sanitation**
    - Community-led sanitation exercises should be promoted to keep drainage channels clear of debris and waste that could lead to water blockage and subsequent flooding.
6. **Further Research and Monitoring**
    - Continuous monitoring and research should be conducted to understand the evolving impact of climate change and urban development on flooding and real estate values in the area.

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Questionnaire

Project Topic: The Effect of Flooding on Residential Property Values (A Case Study of Aduralere, Ilorin East LGA, Kwara State)

SECTION A: Demographic Information

1. **Gender:**
   - ☐ Male
   - ☐ Female
2. **Age Group:**
   - ☐ 18–25
   - ☐ 26–35
   - ☐ 36–45
   - ☐ 46–55
   - ☐ 56 and above
3. **What is your occupation?**
   - ☐ Civil servant
   - ☐ Private sector worker
   - ☐ Trader/Business owner
   - ☐ Artisan
   - ☐ Unemployed
   - ☐ Other (please specify): _____
4. **How long have you lived in Aduralere?**
   - ☐ Less than 1 year
   - ☐ 1–5 years
   - ☐ 6–10 years
   - ☐ Over 10 years

SECTION B: Perception and Impact of Flooding

5. **How frequently does flooding occur in your area?**
   - ☐ Never
   - ☐ Rarely
   - ☐ Occasionally

☐ Frequently

☐Every rainy season

6. **What is the major cause of flooding in Aduralere?**

☐ Poor drainage system

☐ Overflowing rivers/streams

☐ Blocked water channels

☐ Heavy rainfall

☐Other (please specify): _____

7. **Have you ever experienced damage to your property due to flooding?**

☐ Yes

☐No

8. **If yes, what type of damage did your property sustain?** *(Tick all that apply)*

☐ Structural damage (walls, foundation)

☐ Interior damage (furniture, appliances)

☐ Electrical/water systems

☐ Fence/gates

☐Others: _____

9. **In your opinion, does flooding reduce the value of residential property in this area?**

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐Strongly Disagree

10. **Have you considered relocating due to flooding?**

☐ Yes

☐ No

☐Not sure

11. **Are tenants and buyers less willing to rent or buy property in this area because of flooding?**

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐Strongly Disagree

12. **Do you think properties in flood-prone areas are cheaper compared to non-flooded areas in Ilorin?**

☐ Yes

☐ No

☐Not sure

13. **How has flooding affected your property's rental or resale value?**

☐ Greatly Decreased

☐ Slightly Decreased

☐ No Change

☐ Slightly Increased

☐Greatly Increased

Have you made any adjustments or improvements to reduce flood impact on your property?

☐Yes

☐No

☐Planning to