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The Impact of the Lagos Metropolitan Development and Governance Project on Residential Property Values

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Abstract: This paper aimed at empirically investigating the impact of a 'moderately unsatisfactory' urban regeneration scheme on the surrounding housing rental values of units of flats in some selected slum areas of Lagos state, Nigeria. The study employed the hedonic pricing model to assess the rental values of 385 units of flats, and the survey method is used to elicit information from 107 stakeholders. The t-test was used to assess the impact of the Lagos Metropolitan Development and Governance Project (LMDGP) on the rental values of units of flats; while stakeholders' responses were analysed using mean and standard deviation. The t-test results show that the residential housing rental value was significantly higher in the post-urban regeneration period than the pre-urban regeneration period ($t = 28.252$, $p < 0.001$). This is also confirmed by the hedonic pricing model test ($t = 26.289$, $p < 0.001$). The stakeholders' survey findings revealed that the LMDGPs have positive impact on the rental values of units of flats within the study areas. These results attest to the huge potential of using urban regeneration schemes to address urban problems by improving the physical, social, economic, and environmental conditions through reduction of spatial social inequalities, and enhancement of inhabitants' overall quality of life through actions on building and the urban environment, improvement of housing conditions and dysfunctional real estate markets.

Keywords: Urban regeneration; Hedonic model; Rental value; Moderately unsatisfactory; Lagos state

1. Introduction

Urban regeneration is an important policy instrument used by various authorities and governments to address urban dysfunctionalities including social deprivation, economic obsolescence as well as physical/environmental decline of cities and towns (Abass and Kucumehmetoglu, 2021). The factors responsible for the decline in cities of advanced economies such as Europe and North America are quite different from that in developing economies such as Nigeria. The causes of deterioration in cities of advanced economies are associated with rapid transformation and restructuring due to industrialisation. In contrast, urban decay in developing economies is associated with rural-urban migration, rapid population growth, and growth that is associated with industrialisation that is not incremental and controlled (Goksin and Muderrisoglu, 2005; de Magalhaes, 2015). Consequently, the objectives and outcomes of urban regeneration projects would vary significantly in the different economies. Extant literature has established that the fundamental problems which the urban regeneration schemes seek to address are related to the social, economic, and physical/environmental conditions of cities. Presently, the emphasis has been on economic development as it relates to the property market performance amid rapid urbanisation and demographic growth in most cities in Nigeria, especially the Lagos Metropolitan Area, which has led to the proliferation of urban slums. These slums are typified by several challenges and problems including deplorable housing conditions, and an underdeveloped and dysfunctional residential real estate market (Roberts et al., 2017). Consequently, the Lagos State Government (LASG) and its development partners have made concerted efforts to remedy this situation via urban regeneration programmes such as the Lagos Metropolitan Development and Governance Project (LMDGP).

The LMDGP was a World Bank-assisted project designed to boost sustainable access to essential urban services in Lagos state through investments of critical infrastructure in transportation, waste management, sanitation, water, public administration, and poverty reduction in nine selected slums of Amukoko, Ajegunle, Agege, Badia, Ijeshatedo, Iwaya, Bariga, Makoko, and Ileja (See Figure 2), covering a total land area of 760 hectares. In a bid to evaluate the performance of such projects, the World Bank through its Independent Evaluation Group developed the Project Performance Ratings based on a six-point scale as shown in Table 1.

At the close of the LMDGP in 2013, the outcome was rated as “moderately

unsatisfactory" by the IEG-WB Project Performance Ratings (IEG-WB, 2015). In this context, a 'moderately unsatisfactory' project is a project whose outcome has been rated to have significant shortcomings in its achievement of set objectives, relevance, and efficiency by the IEG-WB Project Performance Ratings. Problems encountered during the implementation of the projects include project delay, delay in procurement, poor data collection, non-compliance with safeguards, high staff turnover, and lack of community participation. Since then, no attempt has been made to empirically determine and document the benefits of the LMDGP, particularly its impact on property values within and around the slum areas where it was implemented. Moreover, the survey of literature revealed that no study known to the authors has adopted the hedonic pricing model in determining the impact of urban regeneration programmes on residential property values in Nigeria.

Table 1. IEG-WB project performance outcome ratings.

Outcome	Rank	Description
Highly satisfactory	6	There were no shortcomings in the operation's achievement of its objectives, its efficiency, or its relevance
Satisfactory	5	There were minor shortcomings in the operation's achievement of its objectives, in its efficiency, or its relevance
Moderately satisfactory	4	There were moderate shortcomings in the operation's achievement of its objectives, its efficiency, or in its relevance
Moderately unsatisfactory	3	There were significant shortcomings in the operation's achievement of its objectives, its efficiency, or its relevance
Unsatisfactory	2	There were major shortcomings in the operation's achievement of its objectives, its efficiency, or its relevance
Highly unsatisfactory	1	There were severe shortcomings in the operation's achievement of its objectives, its efficiency, or its relevance

Source: Independent Evaluation Group-World Bank Project Performance Ratings (IEG-WB, 2015).

Therefore, this research aims to investigate the impacts of 'moderately unsatisfactory' urban regeneration projects on surrounding residential property rental values in some selected areas in Lagos state, Nigeria, using the hedonic

pricing model. Specifically, the fundamental question this article sought to address was: To what extent does *a 'moderately unsatisfactory'* urban regeneration project impact surrounding residential housing rental values? The following alternative hypotheses were set:

H_{A1}: There is a price differential in residential property rental value pre and post-urban regeneration periods in the study area,

H_{A2}: There is a significant impact of urban regeneration projects on residential property rental values in the study area.

This paper reveals the importance of an urban regeneration scheme as a tool for sustainable urban development. Consequently, this study contributes to our understanding of the extent the LMDGP has impacted rental prices within the neighbourhoods that benefited from the project. It informs policy-makers such as urban planners, real estate investors, and other private agencies not only in developing countries but also in developed countries experiencing urban challenges.

The remainder of this article is structured into five sections. Section two proceeds with literature review of the impacts of urban regeneration on property values using hedonic pricing models in commercial and residential properties. Section three defines the concept of urban regeneration within the context of this study; and also provides information on the scope, components, funding, projects, and the beneficiaries of the LMDGP. Section four states the study design, type and sources of data collected, mode of collection and data analysis techniques. In section five, results are presented, followed by a discussion of the results. The last section ends with conclusions, policy implications, and areas for further investigations.

2. Literature Review

Urban regeneration is a complex and multi-functional endeavour and an important element for modern-day urban centres aiming to attain sustainable development strategies that involve several stakeholders (Coscia&Rubino, 2020; Bottero et al., 2020). Urban regeneration is an important urban policy instrument that aims at improving the social, environmental, physical, as well as economic conditions of derelict urban areas and cities in different parts of the world. The concept of urban regeneration has evolved as different themes such as reconstruction, revitalisation, renewal, development/redevelopment, and more recently, as regeneration, it has been used in urban improvement schemes or projects for run-down cities and areas. Roberts et al. (2017) classified the different

urban policy themes as they evolve. The major themes in the different eras are urban reconstruction in the 1950s, urban revitalisation in the 1960s, urban renewal in the 1970s, and urban regeneration in the 1990s till date. Although Robert et al. (2017) attempted to differentiate the concepts; one common feature among them is the physical improvement of urban amenities. Consequently, this review of related literature is contextualised under the various concepts of urban regeneration – urban improvement schemes or projects.

The hedonic pricing model is an important scientific tool used in the empirical research of different aspects of housing markets (Chin and Chau, 2003) which theoretical foundation is embedded in Lancaster's (1966) consumer utility theory and Rosen's (1974) model of product differential. These products or goods are priced based on the beneficial attributes or characteristics they possess (Rosen 1974). Though Lancaster's and Rosen's models infer that products have numerous attributes that combine to form bundles of qualities valued by the consumers, they have fundamental differences; for instance, Lancaster's method is more apposite to consumer goods, while Rosen's technique which has become the generally accepted paradigm of the hedonic method is adequate for durable goods such as housing (Hulten, 2003; Chin and Chau, 2003).

Residential housing is a multidimensional product characterised by structural rigidity, spatial fixity, and durability, grouped into neighbourhood/environmental, location, and structural attributes (Mesthrige& Poon, 2015). These qualitative and quantitative attributes are determinants of housing prices and can be obtained from the regression coefficient. Accordingly, the hedonic technique estimates the individual influence of each residential housing attribute on price while other attributes are held constant (Chin and Chau, 2003; So, Tse, and Ganesan, 1997; William, 1991). Chin and Chau (2003) reviewed previous empirical studies and summarised key housing attributes that are commonly used in hedonic price models (See Table 2).

Table 2. Compilation of residential housing attributes used in hedonic models

Category	Attribute
Structural	Floor area
	Number of rooms, bedrooms, bathrooms
	Basement, garage, patio
	Floor level (multi-storey buildings only)
	Building services (e.g., lift, air conditioning, etc)
	Facilities (e.g., swimming pool, tennis court, gymnasium)
	Structural quality (e.g., design, materials, fixtures)
	Age of the building

Neighbourhood	Proximity to shopping centres
	Proximity to good schools
	Proximity to places of worship (e.g., churches, temples, mosques)
	Proximity to hospital
	Proximity to forest
	Income of residents
	Crime rate
	Traffic/airport noise
	Environmental quality (e.g., playground, landscape, garden)
Locational	Distance from the central business district (CBD)
	View of rivers, lakes, or seas
	Views of mountains/hills/valley/golf course
	Length of land lease
	Obstructed view

Source: Chin and Chau (2003)

The hedonic pricing model has been extensively used to determine both residential and commercial property values (Sirmans, 1991; Muhammad, 2017). Besides its use to determine property values, literature search revealed that substantial literature has investigated the impact of urban improvements schemes (amenities) on property values using hedonic pricing models across different towns and cities of the world (see for examples Kaufman and Cloutier, 2006; Mhatre, 2009; De Sousal, Wu, and Westpal, 2009; Alaba, 2010; Ki and Mesthrige, 2010; Bello and Nwosu, 2011; Mihaescu and vomHofe, 2012; Ploegmakers and Beckers, 2015; Mesthrige, Yuk, Wong, 2018; and, Cho, Ekemode, 2019; Kim, and Lee, 2020). To determine the impact of urban regeneration schemes on property values, the hedonic models have often been applied.

De Sousal et al. (2009) measured the impact of publicly assisted 100 brownfield redevelopment projects on adjoining residential property values in Minneapolis and Milwaukee, USA. Using the hedonic model to quantify the effects of the redevelopment schemes on surrounding properties; the study found that there was a significant increase in housing prices of 2.7% and 11.4% in Minneapolis and Milwaukee, respectively. Using three different specifications of the hedonic model: ordinary least square, spatial error, and autoregressive, Mihaescu and vomHofe (2012) empirically analysed the effect of brownfield sites on the market values of single-family residential properties in Cincinnati, Ohio also in the USA. The results showed that there was a significant appreciation in property values of properties located less than 305 metres from a regenerated brownfield site. Mhatre (2009)

investigated the impact of superfund sites on nearby single-family residential properties in Miami-Dade County. Using spatial hedonic prices and ordinary least square modellings to analyse property-level data, the author reported that there was a significant increase in housing values after the remediation programme. Ploegmakers and Beckers (2015) appraised the impact of publicly funded physical improvements on run-down industrial sites in the Netherlands using property scoring matching. Using the data from multiple sources and other site characteristics for more than half of all the sites in that, country, it was revealed that urban physical regeneration of industrial sites had a negligible effect on economic outcomes such as property values among others.

Ki and Mesthrige (2010) empirically examined the effect of Hanoi road redevelopment projects on housing property prices in pre-redevelopment, construction, and post-redevelopment stages. Applying the price-gradient approach that is based on the hedonic model, the findings showed that there was a significant increase in property prices before, during, and after the implementation of the redevelopment project. Using two hedonic price models, Yuk et al. (2018) appraised the impact of different modes of revitalisation programmes on residential property values in Kwun Tong, Hong Kong. The results also revealed that neither redevelopment nor wholesale conversion significantly impacted nearby prices of properties positively which is contrary to the general view that physical value enhancement in the urban neighbourhood increases the value of a property. Cho et al. (2020) examined the effect of the announcement of new urban regeneration projects on residential property values in Ulsan, Korea, using a sample of 7139 transactions for single-family residential properties sold from January 2014 to December 2016. Results of the analysis using the hedonic model revealed that the urban regeneration plan released in December 2015 had a significant positive influence on residential property values within and around the project sites, though with variations across the neighbourhoods.

In Nigeria, there are very limited studies that have investigated the impact of urban improvement projects on property values using the hedonic pricing model. This state of affairs could be attributed to the paucity of data and lack of transparency in the property market. The attempt made by Bello and Nwosu (2011) is worth mentioning. These authors used multiple linear regression based on the hedonic model to analyse the impact of an urban renewal project on residential property values in Oke-Aro and Odopetu neighbourhoods in Akure, Ondo state. The linear regression model was used to investigate the relationship between market rents and neighbourhood attributes. Although the results showed that there was an increase in rental values as a result of the infrastructure upgrading

in the two neighbourhoods, the application of the linear regression model did not follow the standard procedure of the hedonic model in the analysis. Other studies did not apply the hedonic model. For example, Alaba (2010) assessed the impact of the urban renewal programme on residential properties and land values in the Ikeja and Olaleye-Iponri neighbourhoods of Lagos using the Chi-square test. That study revealed that the urban renewal project had a significant positive effect on rental values and land prices. Ekemode (2019) empirically analysed the impact of urban regeneration and renewal programmes on the market values of commercial properties in Osogbo, Osun state before, during, and after the urban renewal programme using data from 63 commercial properties. The data were analysed using analysis of variance and Duncan's post-hoc test, and the results showed that there was an appreciable increase in the rental values of commercial properties in the study area.

From the foregoing literature, it can be deduced that different variants (spatial and aspatial) of the hedonic models have been extensively used in assessing the effects of urban improvement programmes on property values. A majority of the results showed that urban regeneration projects resulted to an increase in values of surrounding properties with very few exceptions. However, no study has investigated the impact of an urban regeneration programme on the rental values of residential properties at pre-regeneration, during and post-regeneration periods. In Nigeria, Alaba's (2010) study focused on rental values but did not adopt the hedonic pricing model. Ekemode (2019) neither investigated residential properties nor adopted the hedonic pricing model. The study by Bello and Nwosu (2011) is focalised on sales value. Therefore, this is the first study to focalise an investigation on the impact of urban regeneration on residential rental values in Nigeria using the hedonic pricing model. Consequently, the study provides insights into the topic for countries in a similar context with Nigerian.

3. Context of the Study - Lagos Metropolitan Development and Governance Project (LMDGP)

Lagos is the largest city in Nigeria and among the largest in sub-Saharan Africa covering a total area of 1,171.28 km^2. It is a megacity of dominant economic importance with rapid urbanisation and urban growth. There is no consensus on the population size of Lagos as data from different sources show that it ranges between 13 million and 20 million or more (Hoelzel, 2018). The United Nations (2018) puts the Lagos population at 13,463,000. According to UN-Habitat (2020), the population of Lagos is over 20 million with a growth rate of 3.2% per annum. A household survey conducted by the Central Office of Statistics, Ministry of

Economic Planning and Budget in collaboration with World Bank in 2005, puts the total population of Lagos State at about 15 million (15,467,425). The survey data formed the baseline information for the implementation of the LMDGP (LASG, 2006).

The rapid urbanisation rate, due to high natality and rural-urban migration, creates both opportunities and challenges. It has the biggest concentration of financial institutions, manufacturing companies, and multinationals in Nigeria. Other prospects that come with urbanisation include innovations, creativity, technological advancement, and economic development. In contrast, urbanisation in Lagos has posed a lot of challenges such as the collapse in infrastructure, urban decay, traffic jam, pollution, and proliferation of slums. In 2006, about 70% of Lagos' population resides in slums under severe poor environmental conditions characterised by regular flooding, densely packed homes, overcrowded and blighted residential neighbourhoods, poor waste management system, and lack of access to good roads and clean water (LASG, 2006; World Bank, 2014; UN-Habitat, 2020). The LASG has taken some audacious steps in addressing these challenges, particularly the proliferation of slums, via different forms of urban improvement programmes with some development partners. A case in point is the LMDGP.

The LMDGP is a World Bank-assisted project designed to boost sustainable access to essential urban services in Lagos through investments in critical infrastructure in nine selected slums covering a total area of 760 hectares. The slums are Amukoko, Ajegunle, Agege, Badia, Ijeshatedo, Iwaya, Bariga, Makoko, and Ileja (See Figure 2). These slums are similar in their demographic composition albeit different location except for Agege and Ileja and Badia and Makoko that have common boundaries. The inhabitants are predominantly low-income earners operating majorly in the informal sector of the economy. The predominant occupations in these slums are trading, farming, fishing, hairdressing, bricklaying, carpentry, barbing, tailoring etc. Nonetheless, blue-collar workers also reside in some of these slums. These are multi-ethnic and multicultural communities as people migrate from different parts of the Nigeria and even neighbouring countries to these areas. These areas are also characterised by high population density, high poverty and crime rates due to high incidence of unemployment; including both formal and informal education. The major factor contributing to population growth in these slums is the movement to Lagos from other geopolitical zones. The slum inhabitants move within and among slums which buttresses the similarities in their demographic composition (Ogunlesi, 2016; Badmos et al., 2020).

The project commenced in July 2006 and closed on schedule in September 2013. It was restructured in July 2011 to accommodate a few changes in the scope of activities under the project component without necessarily altering the project objectives. The estimated cost of the project is USD 200 million and the actual cost is USD 138.28 million. The key beneficiaries are the over 1.6 million people living in the nine (9) selected slums; they were to gain from improved living and health conditions, better sewerage facilities, improved water supply, improved drainage, and improved solid waste management system. Other recipients are Lagos State Government agencies such as the Lagos State Urban Renewal Authority (LASURA), the Lagos State Environment Protection, the Lagos Waste Management Authority, the Office of the Public Defender, and the Central Office of Statistics, Lagos. These agencies benefited from the project through technical assistance, staff training, and consultancy services (World Bank, 2014).

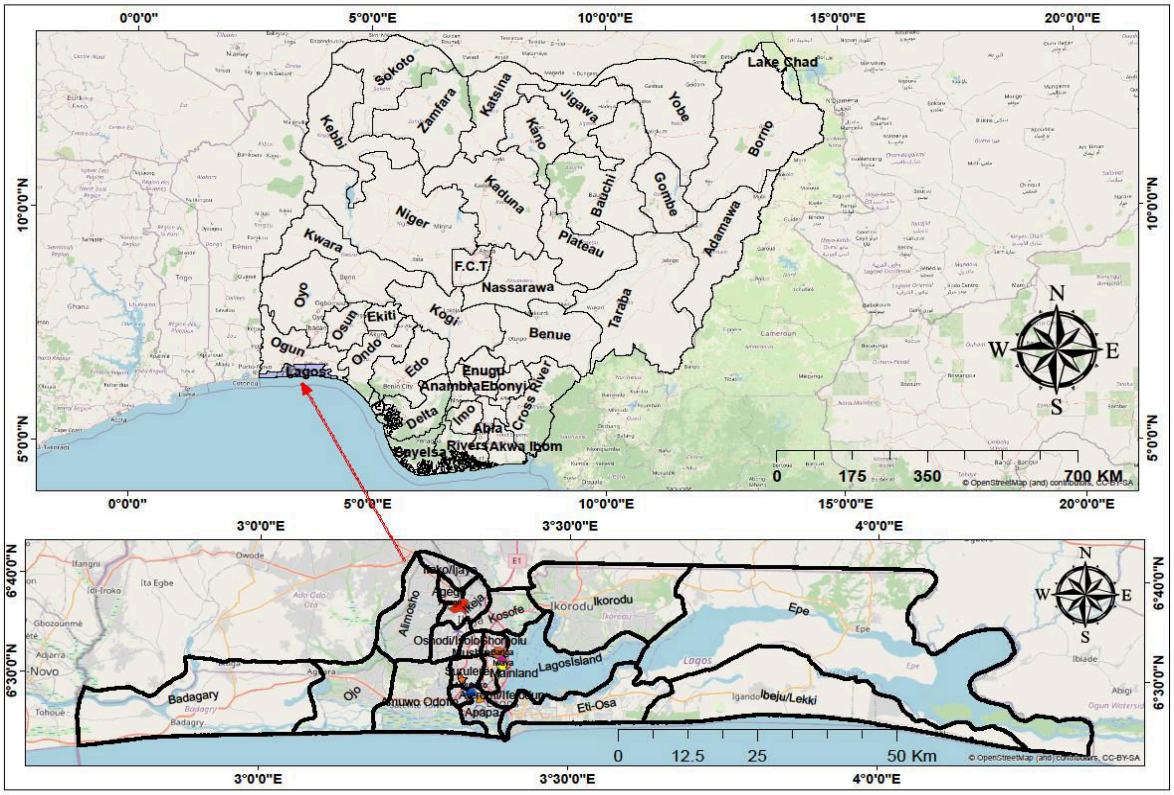

Fig 1. Map of Nigeria and Lagos state

Source: Created by Kingsley Chika Chukwu, Department of Geoinformatics and Surveying, University of Nigeria, Enugu Campus [ArcGIS 10.8, 8/05/2023]

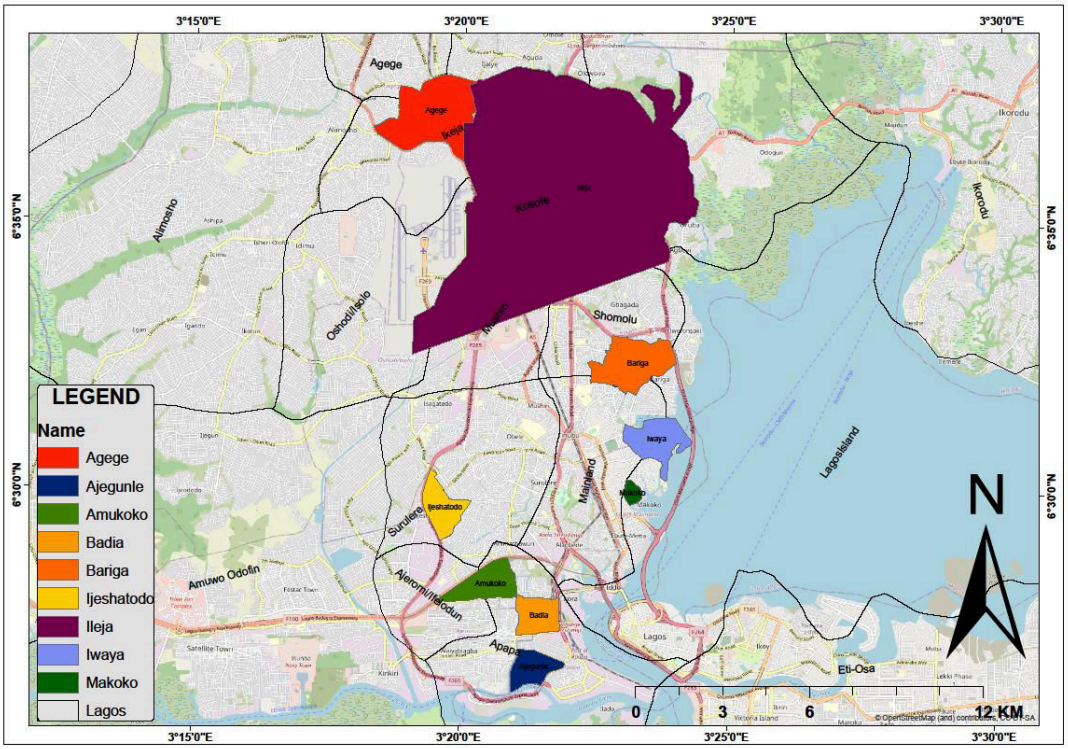

Fig 2. Map of the study areas
Source: Created by Kingsley Chika Chukwu, Department of Geoinformatics and Surveying, University of Nigeria, Enugu Campus [ArcGIS 10.8, 8/05/2023]

The LMDGP was divided into three major components; infrastructure, public finance and capacity building, and urban policy and project coordination. The three major components were further divided into sub-components. For the purpose of this research, only the infrastructure component of the project, which addresses the neighbourhood characteristics of the study areas, is highlighted hereunder.

The three sub-components under infrastructure were drainage, upgrading, and solid waste management. Upgrading aimed to build the capacity of the LASURA to appraise, develop, plan, and manage the implementation of the sub-projects in the nine slums. These sub-projects include the construction of an additional number of classroom blocks, healthcare centres, roads, boreholes, water reticulation, and the provision of transformers and street lights. The objective of the drainage sub-component was to devise a lasting technological solution for flooding. Little construction works on two existing canals and roadside drains were repaired. The last sub-component under infrastructure was solid waste management, which objective is to finance the construction of 2-4 transfer

stations, upgrade two landfill sites, and communal depots, and provide technical assistance to the relevant government agencies. Two communal waste depots were constructed and existing dumpsites were evacuated (World Bank, 2015).

In summary, the social facilities and infrastructure executed in the nine selected slums were 280 additional classrooms either built or revitalised; a total of 8.7 km length roads were constructed; 7 healthcare facilities constructed, repaired, and/or equipped; 75 water facilities constructed and operational; and building of citizens' mediation centres. Overall, the LMDGP outcome was rated as "moderately unsatisfactory" by the IEG-WB (World Bank, 2015; Oshodi *et al*., 2018). These LMDGPs improved the neighbourhood/environmental characteristics of education, public transportation, electricity supply, healthcare services, pollution, level of security and water supply within the study areas. A good number of studies have investigated the impacts of these neighbourhood/environmental characteristics on property values. Examples are Boys and Jeffery (2023); Goodman and Smith (2021); Rajapaksa et al. (2020); Beltran et al. (2018); Brehm et al. (2017); Choumert et al. (2014); Wen et al. (2014) and Hickman (2009). Results from these studies show that improvements on or availability of these amenities/services have positive impacts on property values. The focus of this study is on the impact of neighbourhood/environmental characteristics on residential rental values.

4. Research Methodology

The study adopted a survey research approach using primary and secondary data. While secondary data were sourced from existing literature, the primary data were sourced from the field and divided into two parts: analysis of rental values using t-test, hedonic pricing model and stakeholders' survey.

4.1 Analysis of rental values of units of flats using t-test and hedonic pricing model

A total of 385 units of flats were selected at random from the study areas comprising Amukoko, Ajegunle, Agege, Badia, Ijeshatedo, Iwaya, Ileja, Bariga, and Maroko communities in Lagos state, Nigeria. The urban regeneration projects were executed between 2006 and 2013. During the pre-urban regeneration period, there were few existing blocks of flats compared to the post-urban regeneration period. During post-urban regeneration period, more blocks of flats were constructed which could be attributed to the population influx and partly as a result of the urban regeneration projects. Pre-urban regeneration period (2005), a total of 170 blocks of flats were used for the t-test and hedonic analyses

evaluation, and 215 blocks of flats were used for the post-regeneration period (2014). During the pre-urban regeneration period, the blocks of flats found in the study area were mostly 3-bedroom flats with usually one toilet and one bathroom, but during and post-urban regeneration period, some of the old flats were refurbished and new ones constructed. Due to demand as a result of the demography of the population, the area began to witness the construction of 1-bedroom and 2-bedroom blocks of flats. Some of the blocks of flats rooms are en suite. A majority of the blocks of flats are on two and three floors with very few on one, four, and five floors. Prior to the implementation of the urban regeneration, these blocks of flats lacked public water supply, decent sanitation, and steady electricity supply.

The housing structural property dataset was sourced from estate surveying and valuation firms, local agents, property developers, and via observation. Based on the evidence in previous research on the attributes of residential properties (Sirmans et al., 2006; Hill, 2013), the standard hedonic pricing model (Ordinary Least Square Method) used to analyse the impact of urban regeneration scheme - the LMDGP on the rental values of blocks of flats before and after the projects were executed. The physical variables used were age, finish (quality), number of bedrooms, number of bathrooms, number of floors, and the floor area. Pre-and-post hedonic pricing models were constructed to establish the impact of the urban regeneration projects on the residential housing rental values using the structural attributes of the flats shown in Table 3.

Following this, the standard ordinary least square regression models constructed for the study are:

1. Pre-urban regeneration period model - 2005

$$\text{Rental value}_{(2005)} = \alpha + \beta_1 AGE + \beta_2 FINISH + \beta_3 BEDROOM + \beta_4 BATHROOM + \beta_5 FLOOR + \beta_6 FLOOR\ AREA + \varepsilon$$

2. Post urban regeneration period model - 2014

$$\text{Rental value}_{(2014)} = \alpha + \beta_1 AGE + \beta_2 FINISH + \beta_3 BEDROOM + \beta_4 BATHROOM + \beta_5 FLOOR + \beta_6 FLOOR\ AREA + \varepsilon$$

3. Pre-Post urban regeneration model

$$\text{Rental value}_{(2005,2014)} = \alpha + \beta_1 AGE + \beta_2 FINISH + \beta_3 BEDROOM + \beta_4 BATHROOM + \beta_5 FLOOR + \beta_6 FLOOR\ AREA + \beta_7 IUR + \varepsilon$$

Where $\text{Rental value}_{(2005)}$ and $\text{Rental value}_{(2014)}$ denote the rental values of the

blocks of flats in 2005 and 2014 respectively. β_1, β_2, β_3, β_4, β_5, and β_6 are coefficients for AGE, FINISH, BEDROOM, BATHROOM, FLOOR, and FLOOR AREA respectively, were estimated. In comparing the average rental values for both the pre (2005) and post (2014) urban regeneration periods, the 2014 rental values are adjusted to the 2005 levels to eliminate the effect of inflation. The 2014 values are adjusted to 2005 levels to obtain real values, while the 2005 rental values do not require adjustment since they serve as the base year. The formula applied for the adjustment is: r(2005) = R(2014) / (1 + i)^n, where r(2005) represents the 2014 rental values converted to the 2005 levels, i denotes the inflation rate, and n represents the number of years between the intervening period (i.e., 9 years).

Table 3. Description of variables used in the hedonic price model.

Variable	Description
Rental value$_{(2005)}$	The annual rental value per unit flat within the areas of study before the implementation of the urban regeneration projects. Sourced from estate surveyors and valuers, housing agents, occupiers and property developers. This is measured in Naira.
Rental value$_{(2014)}$	The annual rental value per unit flat within the areas of study after the implementation of the urban regeneration projects (in 2005 price levels). Sourced from estate surveyors and valuers, housing agents, and property developers. This is measured in Naira.
AGE	The ages of the units of flats were represented with a dummy variable, 0 and 1. "1" represents a new or refurbished block of flats, and "0" represent an old block of flat.
FINISHES	FINISHES denote the nature of the material used for construction and luxurious components and facilities in the flat. If the finishing is luxury, it denotes "1" and if it is standard, it denotes "0". FINISHES is a dummy variable.
BEDROOM	A bedroom is a space that has a door that can be closed, a window, and a closet. The rental value of a block of flats increases with an increasing number of bedrooms. The number of bedrooms in a flat range from 1 to 4.
BATHROOM	The bathroom designates the number of bathrooms in a flat. The bathroom comprises a sink, toilet, shower, and in some cases bathtub, especially for the master's bathroom. The rental value increases with the number of bathrooms.

FLOOR	This is the floor level of the flat in a building. The floor level is a continuous variable.
FLOOR AREA	The usable area of each block of flats is measured in square meters. The floor area is a continuous variable.
IUR	The impact of urban regenerationrepresented with a dummy variable, 0 and 1. "1" represents post urban regenerations, and "0" represents pre urban regeneration.
α, β_1, β_2, β_3, β_4, β_5, $\beta_6$and β_7	These are the coefficients to be estimated.
ε	This is the stochastic term.

Notably, data on the ages of the blocks of flats could not be established as a result of the paucity of records. Alternatively, the ages of the blocks of flats were represented with a dummy variable, 0 and 1. "1" represents a new or refurbished block of flats, and "0" represent an old block of flat. FINISH denotes the nature of the material used for construction and luxurious components and facilities in the flat. If the finishing is luxury, it denotes "1" and if it is standard, it denotes "0". BEDROOM is the number of bedrooms in a flat which ranges from 1 to 4. BATHROOM designates the number of bathrooms in a flat. FLOOR represents the number of floor levels, and FLOOR AREA designates the total floor area of each flat. The average inflation rate of the housing rents (8.01%) between 2006 and 2014, was used to convert the 2014 rental value to the 2005 rental value. The data was sourced from the National Bureau of Statistics (NBS).

4.2 Stakeholders' survey

To investigate the impact of the LMDGP on rental values of flats, purposive and snowball samplings were used to select the key informants comprising 137 stakeholders for the study. This was to partly make up for the neighbourhood and location characteristics not incorporated in the hedonic model (See De Sousa et al., 2009). In total, 137 copies of questionnaire (see Appendix A) were administered to the stakeholders comprising 15 LASURA senior staff, 28 real estate investors, sourced from Lagos State Chamber of Commerce and Industry; and 94 residents were selected from the study areas (see table 3). A common criterion for selecting the stakeholders is that they are well informed in the implementation of the LMDGP. The LASURA senior staff members were selected because of their experience and knowledge; they were also directly involved in the implementation of the LMDGP. They were identified through the administrative secretary of the agency. The property investors were selected based on their

development interests in those communities. The residents were identified with the assistance of the 'Bale' (Local Chief) in the communities. Those selected have lived before, during and after the regeneration programme. Furthermore, some of the residents, who are local real estate agents, were selected because of their vast knowledge about the market. The survey was conducted between 11th August 2018 and 12th October 2021. A total of 107 properly filled questionnaires were retrieved giving a response rate of 78.1%.

Table 4. Table showing sample distribution of stakeholders

Stakeholder	Sample distribution	Percentage (%)
LASURA Senior Staff	15	10.97
Residents	94	68.61
Property Investors	28	20.43
Total	137	100

Source: Field survey 2020

Note: Table 4 is exactly the same as table 1 in Onyekwelu and Ogbuefi (2021). Both are from the same doctoral thesis.

The data collection instrument used was a structured questionnaire designed by the authors. It was divided into two major sections, A and B. Section 'A' contained questions that elicited information on the stakeholders' characteristics, while Section 'B' was used to collect data on the stakeholders' perception of the impact of the urban regeneration projects on rental values within the study areas. The questions were closed-ended questions on 5-point Likert type scales of very negative impact = 1, moderately negative impact = 2, no impact = 3, moderately positive impact = 4, and very positive impact = 5. The reliability test result of the instrument showed that the Cronbach's Alpha coefficient for each of the split halves 1 and 2 were 0.897 and 0.859, respectively, and the correlation between forms was 0.886, indicating very strong reliability.

The respondents were asked to rate the impact of the specific urban regeneration projects on the residential property rental values of units of flats. The specific urban regeneration projects carried out within the study area include construction of more classroom blocks, construction of drainage channels, provision of more primary healthcare centres, construction of new roads and rehabilitation of existing ones, water reticulation, provision of more transformers, provision of street lights and electric transmission lines. The responses were analysed using simple descriptive statistics such as weighted average score (mean) and standard deviation. The mean criterion mark was 3.0. This means that if the mean mark of the responses is equal to 3.0 and above, then the impact of the urban

regeneration projects on the rental values in the study area is significant and vice-versa.

5. Results and Discussion

5.1. Results

5.1.1. The t-test Results

Table 5 shows the results of the first hypothesis test using the t-test. The results show that the rental values of the blocks of flats were significantly higher post-urban regeneration compared to the pre-urban regeneration period ($t = 28.252$, $p < 0.001$). Therefore, the alternate hypothesis is accepted and the null hypothesis is rejected. The interpretation of this result is that the urban regeneration project (LMDGP) increased the rental values of the units of flats within the study area baring inflation.

Table 5. Comparison of the mean price differential in residential property rental values between pre and post-urban regeneration periods.

	Pre-Regeneration Mean ± SD	Post-Regeneration Mean ± SD	t	P value
Rental value	144400.00 ± 18441	259134.88 ± 50335.97	28.252	< 0.001

5.1.2. Hedonic pricing model

Table 6 shows the results of the descriptive statistics of the units of flats rental values and property-specific attributes in the post-urban regeneration period of 2014. The mean rental value, ₦259,135 (approx) is higher than that of the pre-urban regeneration period of ₦144,400; which shows an increase of 179.5% before and after the execution of the urban regeneration. The mean mark of the bedroom is 2.38, an indication that a majority of the blocks of flats are two rooms. This is in tandem with the current trend of development as a result of current demography. This was confirmed via observation. The mean mark of the number of bathrooms is 1.65, an indication that most of the blocks of flats have two bathrooms. The mean mark on the number of floors is 2.60 shows that a majority of the flats are on two and three floors as against a single floor. The average floor area of 47.62m^2 is less than that in the pre-urban regeneration period. The implication is that the blocks of flats constructed in the pre-urban regeneration period were larger in area than those constructed in the post-regeneration period.

Table 6. Descriptive statistics of variables in the hedonic model (post-regeneration, 2014)

	N	Minimum	Maximum	Mean±SD/n (%)
Rent	215	165000.00	350000.00	259134.88 ± 50335.98
Age (1)	215	0.00	1.00	184 (85.6)
Finish (1)	215	0.00	1.00	96 (44.7)
bedroom	215	1.00	3.00	2.38± 0.75
bathroom	215	1.00	3.00	1.65 ± 0.60
Floor	215	1.00	3.00	2.60± 0.54
Floor area	215	21.00	60.00	47.62± 11.85

Table 7 below shows the descriptive statistics of the rental values of the flats and their property-specific characteristics during the pre-urban regeneration period of 2005. The minimum rental value was ₦95,000, while the maximum value was ₦180,000. Checking the standard deviation in comparison with the mean (coefficient of variation), the result shows that there is consistency/uniformity in the rental values. The bedroom's mean value of 2.44 shows that there are more 2 and 3-bedroom flats vis-à-vis 1 bedroom during this period. The mean value of 1.9 indicates that a majority of the flats have two bathrooms. The floor's mean value of 2.3 shows that most of the flats are built on two (2) floors. The mean floor area is 54.62, this value shows that a majority of the flats fall between 2 and 3bedroom flats.

Table 7. Descriptive statistics of variables in the hedonic model (pre-regeneration, 2005).

	N	Minimum	Maximum	Mean±SD/n (%)
Rent	170	95000.00	180000.00	144400.00± 18441.78
Age	170	0.00	1.00	125 (73.5%)
Finish	170	0.00	1.00	124 (72.9%)
bedroom	170	1.00	3.00	2.44± 0.71
bathroom	170	1.00	3.00	1.90± 0.58
Floor	170	1.00	3.00	2.30± 0.54
Floor area	170	22.00	71.30	54.62 ± 14.55

Table 8. Descriptive statistics of variables in the hedonic model (pre-post regeneration).

	N	Minimum	Maximum	Mean	Std. Deviation
Rental value	385	95000	350000	208472.73	69398.93
Number of bedroom	385	1.00	3.00	2.41	0.73
Number of bath	385	1.00	3.00	1.76	0.60
Floor	385	1.00	3.00	2.47	0.56
Floor area	385	21.00	71.30	50.71	13.55

Table 8 above shows the descriptive statistics of the variable for combined pre and post urban regeneration periods.

Table 9 shows that the independent variables accounted for 68.7% of the variations in rental value in the pre-urban regeneration era devoid of inflation. The number of bedrooms was a significant positive predictor of rental value, while the number of floors was a significant negative predictor of rental value in the pre-urban regeneration period. A unit increase in the number of bedrooms leads to 16128.467 increases in rental value. Conversely, a unit decrease in the number of floors leads to 127.852 increases in rental value. The results also show that age, finishing, and floor area have no significant influence on the rental values of the units of flats.

Table 9. Impact of pre-urban regeneration projects on the residential property rental values.

	β	*SE*	*t*-Stat.	P value
Intercept	88715.485	5293.486	16.759	< 0.001*
Age**	7604.673	10765.065	0.706	0.481
Finish**	12546.178	10557.961	1.188	0.236
bedroom	16128.467	5861.042	2.752	0.007*
bathroom	899.297	1906.098	0.472	0.638
Floor	-6127.852	1592.645	3.848	< 0.001*
Floor area	255.484	283.414	0.901	0.369

*Note: Dependent variable is rent, R^2 = 0.687; *95% significance level; **Dummy variables: age and finishing. For age code 1 = current, code 0 = old; for finishing code 1 = good, code 0 = poor*

Table 10 shows that the model accounted for around 74.7% of the variations in rental value in the post-urban regeneration period. Notably, factors such as age, finishing, number of bedrooms, and floor area were significant positive predictors of rental value while the number of floors was a significant negative predictor of rental value in the post-urban regeneration period. This result is contrary to the results of the pre-urban regeneration era. The results could be interpreted thus, renters in the present dispensation comprising young married couples and single working-class adults consider the age and finishing of the blocks of flats unlike what was obtainable in the pre-urban regeneration era. In both periods, the number of bathrooms has no significant impact on the rental values of the blocks of flats.

Table 10: Impact of post-urban regeneration projects on the residential property rental values

	β	*SE*	*t*-Stat.	P value
Intercept	166390.312	15543.390	10.705	< 0.001*
Age	18183.136	6041.138	3.010	0.003*
Finishing	17107.901	5661.480	3.022	0.003*
bedroom	99614.866	11655.606	8.547	< 0.001*
No. of bathroom	302.750	4177.712	0.072	0.942
Floor	-10401.790	4441.906	2.342	0.020*
Floor area	2642.729	740.274	3.570	< 0.001*

*Note: Dependent variable is rent, R^2 = 0.747; *95% significance level; Dummy variables: age and finishing. For age code 1 = current, code 0 = old; for finishing code 1 = good, code 0 = poor*

Table 11: Impact of urban regeneration projects on the residential property rental values

	β	SE	t	P value
Intercept	88064.013	9395.684	9.373	< 0.001*
Age	24579.168	4315.583	5.695	< 0.001*
Finishing	-8634.360	4125.638	-2.093	0.037*
Number of bedroom	101776.611	6848.232	14.862	< 0.001*
No. of bathroom	-2329.060	2795.219	-.833	0.405
Floor	-8547.396	2635.747	-3.243	0.001*
Floor area	-3292.024	387.263	-8.501	< 0.001*
IUR	94354.083	3589.166	26.289	< 0.001*

*Note: Dependent variable is rent, R^2 = 0.889, *significant at <5% level of significance;*

Dummy variables: Age: code 1 = current, code 0 = old; Finishing: code 1 = good, code 0 = poor; IUR: code 1 = post-regeneration, code 0 = pre-regeneration

Table 11 presents the results of the hedonic price model test, combining the pre and post rental values. While tables 9 and 10 focus on the relationships between rental values and the structural characteristics of the flat units in the different periods, table 11 shows the impact of urban regeneration projects (LMDGP) on rental values. The t-value and p-value of the IUR variable ($t = 26.289$, $p < 0.001$*) clearly indicate that the impact of the LMDGP is statistically highly significant. This result implies that there is a rent premium in the post-regeneration period compared to the pre-regeneration period. As a result, we can confidently accept the second alternate hypothesis.

5.1.3. Stakeholders' survey

Table 12 shows the results of the stakeholders' profiles comprising gender, stakeholder category, occupation, and highest educational qualification. There are more males, 68(63.6%) than the female, 39(36.4%) respondents in the survey. In the stakeholder category, the residents constitute 78(72.9%) of the sample, property investors 15(14.0%), and government staff, 14(13.1%). In occupation, private employers were 46(43.0%), public servants 28(26.2), business 24(22.4%), and others 9(8.4%). On the highest educational qualification; 4(3.7%) have a first school leaving certificate (FSLC), 24(22.4%) have GCE/SSCE/WASSCE, 13(12.1%) have an ordinary national diploma (OND), 32(29.9%) have a higher national diploma (HND), 16(15%) have BSc/BTech, 14(13.1%) have MSc/M. Tech and 4(3.7%) have PhD. Furthermore, the majority of stakeholders are educationally qualified to respond to the questions in the questionnaire with very little explanation. This yielded a very high response rate (78.1%) and unbiased responses with near-accurate information based on the research questions.

Table 12. Demographic characteristics of the respondents.

	Frequency	Percent
Gender		
Male	68	63.6
Female	39	36.4
Stakeholder category		
Government agent	14	13.1
Resident	78	72.9
Property investor	15	14.0
Occupation		
Business	24	22.4
Private employer	46	43.0

Public servant	28	26.2
Others	9	8.4
Highest educational qualification		
FSLC	4	3.7
GCE/SSCE/WASSCE	24	22.4
OND	13	12.1
HND	32	29.9
B.Sc./B.Tech	16	15.0
M.Sc./M.Tech	14	13.1
Ph.D.	4	3.7

Source: Field survey 2020

Note: Table 12 is exactly the same as table 2 in Onyekwelu and Ogbuefi (2021). Both are from the same doctoral thesis.

In table 13, the mean and standard deviation of the impact of the LMDGP on rental values of the blocks of flats are presented. The mean and standard deviation ratings of the LMDGP on rental values are; school classroom blocks (4.24 ± 0.74), drainage channels (4.07 ± 0.82), primary health-care centres (3.93 ± 0.82), roads (4.02 ± 0.87), boreholes (3.64 ± 0.93), water reticulation (3.62 ± 0.91), provision of more transformer (3.83 ± 1.04), installation of streetlights (3.77 ± 0.89), and electric transmission lines (3.79 ± 0.94). Construction of more classroom blocks, drainage channels, and roads was perceived by the stakeholders as among the LMDGP with the highest ranking mean score on the rental values of the blocks of flats; while boreholes and water reticulation are among the least in ranking of the impact of rental values.

In addition to being ranked with the highest mean score, the construction of more classroom blocks has the lowest standard deviation score, an indication that education acquisition is a very important determinant of rental values. This is followed by drainage channels, which is inferred that flooding is an important factor that determines the rental values of residential properties. The next in rank is the road. Motorable road is a significant rental value determinant. Overall, all the LMDGPs are perceived to have significantly impacted the rental values of the blocks of flats in the study area based on the mean criterion mark of 3.0. That is every project with a mean score equal to or more than three is perceived to have a significant impact on the rental values of the blocks of flats. Provision of more transformers has the highest standard deviation score, followed by water reticulation, though they significantly impacted the rental values based on their mean scores, the responses were inconsistent.

Table 13. Rating of the impact of urban regeneration projects on residential property rental values.

Components of LMDGP	Mean Score	Std. Deviation
School classroom blocks	4.24	0.74
Drainage channels	4.07	0.82
Roads	4.02	0.87
Primary health-care centers	3.93	0.76
Provision of more transformer	3.83	1.04
Electric transmission lines	3.79	0.94
Streetlights	3.77	0.89
Boreholes	3.64	0.93
Water reticulation	3.62	0.91

Source: Field Survey 2020

5.2. Discussion

This study investigated the impacts of moderately unsatisfactory urban regeneration projects on surrounding residential property rental values in selected slum areas of Lagos metropolis, Nigeria. The findings showed that there is a price differential – that is after the urban regeneration scheme was carried out the rental values of the residential properties increased barring inflation. This result is in tandem with previous studies that have investigated the impacts/effects of urban regeneration on property values be it commercial or residential (De Sousa et al., 2009; Mihaescu&vomHofe, 2012; Mhatre, 2009; Mesthrige et al., 2018; Cho et al., 2020; Bello & Nwosu, 2011; Ekemode, 2019). The only exception to this result is the study by Ploegmakers and Beckers (2015). Their investigation revealed that the urban regeneration scheme had no significant impact on property values. What makes this study peculiar is the fact that the LMDGP was declared 'moderately unsatisfactory' by the IEG-WB Project Performance Ratings (IEG-WB, 2015). Ordinarily by this verdict, it would have been expected that the scheme would not have had an impact on the rental values of the blocks of flats; on the contrary, the impact was appreciably significant.

On the structural characteristics of the blocks of flats, the findings are generally consistent with the hedonic literature. For example, Liu et al. (2015) posited that structural characteristics such as floor level, floor area, and decoration are positively correlated with housing prices. This is in contradiction with the findings of this study. In both the pre-and post-urban regeneration periods, the structural characteristics such as age, finishing, number of bedrooms, number of bathrooms, and floor area were positively correlated with the rental values except for the floor

level which was negatively correlated with the rental values. The previous studies by Yau (2009) and Mesthrige and Poon (2015) also contradict this finding. This could be attributed to the difficulties in living on higher floors in slum areas. For instance, residents might be physically moving water from the ground floor to the upper floor since there is no public water supply system; even if there is, there may be no provision of an automated plumbing system that could move the water to higher floors. Furthermore, due to the haphazard nature of developments within the slum areas, those living on higher floors might not have access to air and natural light. Another important distinction between the findings of other studies from that of this study is the positive correlation of the age of residential buildings with the rental values. It was expected that based on the hedonic literature, the age of the building should be negatively correlated to the rental value (Mesthrige& Poon, 2015; De Sousa et al., 2009). This development could be attributed to the use of a dummy variable and the implication cannot be further explained.

Based on the empirical findings, it is also important to note that in the pre-urban regeneration period, some structural attributes of the units of flats were not a significant determinant of the rental values. These include the age of the building, the finishing, number of bathrooms, and floor area. In contrast, except for the number of bathrooms, all the aforementioned attributes were significant determinants of the rental values in the post-urban regeneration period. This shows that after the regeneration scheme, occupants or those seeking accommodation had to consider the age of the building, the finishing, and the total floor area unlike in the pre-urban regeneration period. The floor area is quite significant in the sense that the floor areas of rooms in buildings constructed during and after the LMDGP became smaller. Developers began to maximize space unlike what was obtainable before the implementation of the LMDGP. This became an important attribute that prospective tenants look out for while seeking accommodation. Due to the new buildings that were developed during the regeneration scheme, some landlords had to refurbish and/or renovate their existing houses so that they could command higher rent parity with the new buildings within the areas. With this development, finishing became a significant rental value determinant unlike what was obtainable before the urban regeneration scheme. The age of the building also became a significant determinant because there are more new buildings, renovated or refurbished buildings from which prospective tenants could make their choices as against the old ones that have remained in their original state even after the urban regeneration scheme.

In the pre-urban regeneration period, the structural attributes of the block flats account for about 68.7% of the variations in the rental values showing a deficit of 31.3%. This could be attributed to the non-inclusion of the location and neighbourhood attributes of the housing in the hedonic pricing model. In the post-urban regeneration model, the physical attributes accounted for about 74.7% variation of the rental values with a deficit of 25.3% which also shows that some other determinant variables were not accounted for. Since the adjusted R^2 for both the pre-and post-urban regeneration periods are more than two-thirds, this buttressed the fact that the physical attributes are more important than both location and neighbourhood attributes of housing. This position is supported by Hill (2011) who posited that physical attributes are the most often used in hedonic regression for housing. This study empirically validates Hill's position.

The empirical evidence from the hedonic model confirms that a *'moderately unsatisfactory'* urban regeneration scheme, the LMDGP, can impact residential housing rental values by showing a significant difference in the rental values of blocks of flats during pre and post-urban regeneration periods. Consequently, the increase in rental values is one of the benefits of urban regeneration programmes from the economic perspective. This means more income for the landlords and real estate investors/developers, a relatively functional real estate market, and an attendant increase in government revenue in the form of property taxation.

Generally, the provision of urban amenities such as schools, drainage channels, roads, primary health-care centres, water reticulation, transformers, boreholes, streetlights, and electric transmission lines, impact property values (Li et al., 2016). Construction of new classroom blocks was ranked as the most impactful having scored a mean mark of 4.24 with the lowest standard deviation mark showing greater consistency in the responses of the stakeholders. This finding shows that school is an important rental determinant. For instance, Brehm (2016) posited that prior studies found clear impacts of schools and school quality on property values. Although in the LMDGP more classroom blocks were provided, this could serve as a proxy for school quality. An empirical investigation by Rajapaksa et al. (2020) in Brisbane, Australia, revealed that good schools had a significantly high impact on both property and rental values. Hence, the construction of more classroom blocks in the LMDGP is considered to have a significant impact on rental values in the study area.

The stakeholders judged the construction of drainage channels as the second

most impactful amenity on rental values. Flooding is a common future in slum areas as a result of lack of or inadequate provision or blocked drainage systems. Flooding negatively impacts property values (Beltran et al., 2018), therefore anything that could be done, such as the construction of proper drainage channels to check for floods would enhance rental values. Water reticulation, that is public water supply system, has the least impact on rental values as adjudged by the stakeholders. The reason could be that the residents have alternative sources of water supply other than the public water supply system which over time has become moribund. Residents depend on artesian wells and other sources such as streams and rivers. The stakeholders deemed boreholes as having more impact on rental values which gives credence to the fact that boreholes are more reliable than the public water supply systems. In support of a previous study by Abidoye and Chan (2016), it was also found that the remaining amenities, primary healthcare centres, roads, and electricity generation have a relatively significant impact on property rental values.

6. Conclusion

The principal aim of this study was to empirically appraise the impact of the LMDGP, an urban regeneration scheme, on residential rental values of units of flats in nine selected slums in Lagos state. The study determined the rental price differential pre and post urban regeneration using the t-test and also incorporated the hedonic pricing model to assess rental values and structural characteristics of the flats. Also assessed is the stakeholders' perception of the impact of the projects on the rental values within the study areas. Even though they were significant shortcomings in achieving the project's objectives, efficiency, and relevance; results based on the t-test and stakeholders' feedback show that the urban regeneration programme positively impacted rental values of units of flats. Feedbacks from the project stakeholders show that the provision of social and transportation infrastructures had significant impact on the rental values of units of flats within the study areas. These results attest to the huge potential of using urban regeneration schemes to address urban problems by improving the physical, social, economic, and environmental conditions through reduction of spatial social inequalities, and enhancement of inhabitants' overall quality of life through actions on building and the urban environment, and improvement of housing conditions (Coscia and Rubino, 2020; Bottero et al., 2020).

Typically, it would have been expected that there wouldn't be an increase in the rental values as the project was rated *'moderately unsatisfactory,'* but this was not the case as the empirical results proved otherwise. It is important to note that the

increase in the rental prices of the units of flats, based on the t-test, is just an aspect of the benefits of urban regeneration schemes which relates to economic improvement. It is debatable to assume that if there were minor or no shortcomings in the implementation of the urban regeneration scheme, it would have had a much greater impact not only on the rental values, but also on the physical, social, and environmental conditions within the study areas. For instance, if the LMDGP performance outcome was rated 'satisfactory' or 'highly satisfactory' (See Table 1), would it have had more impact on the rental values of the flats than what the empirical results indicated based on the 'moderately unsatisfactory' outcome in which there were significant shortcomings in the LMDGP implementation? This should be a subject for further investigation.

Although this paper did not x-ray the challenges in the implementation of the LMDGP, IEG-WB's (2015) report listed some problems that affected its implementation. These include project delay, delay in procurement, poor data collection, non-compliance with safeguards, high staff turnover, and lack of community participation. Delay in procurement and high staff turnover could lead to project delay; while the consequences of project delay are time and cost overruns (Gebrehiwet and Luo, 2017). Poor data collection could hamper a robust cost-benefit analysis or lead to cost-benefit analysis not being conducted at all. Lack of community participation is a critical impediment to the effective implementation of urban regeneration processes. One of the cardinal policies of the World Bank in any project development/implementation is community participation which ensures accountability, transparency, and effectiveness in government institutions. The three major stakeholders in the LMDGP are the LASG, the World Bank, and the inhabitants of the nine slums who are the direct beneficiaries of the upgrading projects. Non engagement of these inhabitants during the design and implementation stages of the projects is unlikely to benefit them, and could also lead to unsustainable urban regeneration.

Both public and private stakeholders in urban regeneration schemes most especially in less-developed countries must take cognisance of these factors that hindered the effective implementation of the LMDGP when embarking on any urban regeneration programme. Rapid urbanisation in Lagos state signifies the need to develop and maintain a sustainable and resilient urban system through an urban regeneration scheme that should not only be reactive but proactive in addressing the urban challenges (Roberts et al., 2017). On this note, this paper recommends that policymakers and practitioners in urban regeneration engage communities where schemes are being implemented; develop a database and

data management system and development of institutional capacity for effective implementation of sustainable urban regeneration schemes. For instance, the LASG should adopt the 'participatory approach' in the community engagement process in subsequent urban improvement schemes which according to Hickman (2009) will "simultaneously generate livelihoods alongside physical improvements while reforming government capacity to repeat or scale up projects." A post-hoc study should be conducted to ascertain the sustainability of the urban regeneration scheme socially, economically, and environmentally.

Supplementary Materials: There is no downloadable supporting information.

Authors Contributions: Conceptualisation, Ezinne Ifeoma Onyekwelu; **methodology**, Obinna Collins Nnamani and Joseph Ugochukwu Ogbuefi; **software,** Obinna Collins Nnamani; **validation**, Ezinne Ifeoma Onyekwelu, Obinna Collins Nnamani, and Joseph Ugochukwu Ogbuefi; **formal analysis**, Obinna Collins Nnamani; **investigation**, Ezinne Ifeoma Onyekwelu and Obinna Collins Nnamani; **resources**, Ezinne Ifeoma Onyekwelu; **data curation**, Obinna Collins Nnamani; **writing – original draft preparation**, Ezinne Ifeoma Onyekwelu and Obinna Collins Nnamani; **writing – review and editing**, Obinna Collins Nnamani; **visualisation**, Obinna Collins Nnamani; **supervision**, Joseph Ugochukwu Ogbuefi; **project administration**,Obinna Collins Nnamani; **funding acquisition**, NA.

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Appendix A: Questionnaire

Section A: Respondent's Profile

1. Name (optional).....
2. Gender: a. Male [ ] b. Female [ ]
3. Stakeholder Category
   a. Government agent [ ] b. Resident [ ] c. Property investor [ ]
4. Occupation
   a. Business [ ] b. Private employer [ ] c. Public servant [ ] d. Others (please specify).....
5. Highest educational qualification
   a. FSLC [ ] b. GCE/SSCE/WASSCE [ ] c. OND [ ] d. HND [ ] e. B.Sc/B.Tech [ ] f. M.Sc/M.Tech [ ] g. Ph.D [ ]
6. Location/Area of Residence (where applicable)
   a. Amukoko [ ] b. Ajegunle [ ] c. Agege [ ] d. Badia [ ] e. Ijeshatedo[ ] f. Iwaya [ ] g. Ileja [ ] h. Bariga [ ] i. Makoko [ ]
7. Address of property (optional) .....

Section B

Rate the impact of the urban regeneration projects on residential property rental values using the following Likert scale: 1 – very negative impact (VNI), 2 – moderately negative impact (MNI), 3 – no impact (NI), 4 – moderately positive impact (MPI) and 5 – very positive impact (VPI).

Urban regeneration projects	VPI 5	MPI 4	NI 3	MNI 2	VNI 1
School classroom blocks					
Drainage channels					
Primary health-care centres					
Roads					
Boreholes					
Water reticulation					
Provision of more transformer					
Street lights					
Electric transmission lines					

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