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TECHNOLOGY
INTERNATIONAL CONFERENCE 2024
(SETIC 2024)**

22nd – 24th October, 2024

**Federal University of Technology, Minna,
Niger State, Nigeria**

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PREFACE

The School of Environmental Technology International Conference (SETIC 2024), organized by the School of Environmental Technology, Federal University of Technology Minna, Nigeria, is a prestigious platform that brings together experts from diverse fields to exchange knowledge and drive innovation. This year, the conference is held in collaboration with notable institutions, including the School of Architecture and Design, Lovely Professional University, New Delhi, India; Abubakar Tafawa Balewa University (ATBU), Bauchi State, Nigeria; the Architectural Engineering Department, Najran University, Najran, Saudi Arabia; Perch Inc Development Consultancy Services, Zimbabwe; Faculty of Health Sciences, Graduate Education Institute, Istanbul Gelişim University, Istanbul, Turkey; Robotics & Additive Technologies Innovation Research Cluster, Transport & Communication Institute, Riga, Latvia; Architectural Engineering Department, College of Engineering, University of Hail, Hail, Saudi Arabia; New Gate University, Minna, Nigeria; and the University of Law Business School, Birmingham, United Kingdom, to mention a few.

This year's theme, "Global Economic Revolution and the Resilience of the Built Environment in an Emerging World," seeks to explore the dynamic relationship between global economic shifts and the adaptability of the built environment. The theme emphasizes the necessity for resilience, sustainability, and innovation in the face of unprecedented challenges and evolving economic landscapes. The sub-themes of the conference delve into crucial aspects such as sustainable design, technological integration, disaster management, and the role of policy in shaping future infrastructures.

The response to this year's conference has been both enthusiastic and far-reaching, with participants from a wide range of countries, including Latvia, India, Turkey, United Kingdom, Malaysia, Saudi Arabia, Zimbabwe, South Africa, and beyond. The hybrid nature of the event offering both virtual and physical participation has enabled an even broader exchange of ideas and perspectives. The conference serves as a vibrant platform for professionals, academics, and researchers to engage with cutting-edge developments in the built environment and related fields, fostering collaborations that will shape the future of global practice.

A wide range of papers, spanning science, engineering, and the social sciences, have been presented at this year's event, highlighting the interdisciplinary nature of challenges we face and the solutions to these challenges.

We would like to express our deep gratitude to the SETIC 2024 Conference Organizing Committee (COC) for their unwavering dedication and hard work in making this conference a resounding success. We are confident that this event will inspire all participants and leave a lasting impact on the field

ACKNOWLEDGEMENT

The success of SETIC 2024 is built upon the foundation laid by the previous editions of the School of Environmental Technology International Conference held in 2016, 2018, 2020, and 2022. We owe a great deal to the unwavering support and commitment of many, particularly the Vice-Chancellor of the Federal University of Technology, Minna, and the Dean of the School of Environmental Technology, alongside Dr Dodo Y. A., Dr Ajayi O. G., Dr Moveh S., Dr Kayode I. Adenuga and other esteemed colleagues whose efforts has been instrumental to this success.

It is my privilege, on behalf of the Conference Organizing Committee (COC), to extend a big thank you to all that attended the 5th Biennial SETIC, held between October 22nd to 24th, 2024. We are grateful for the opportunity to witness this grand event, now enhanced by the hybrid format, accommodating both physical and virtual participation—an innovation born from the challenges of the global pandemic.

This year's conference had serves as an international platform where scholars, professionals, and practitioners in the built environment and allied fields converge to tackle critical issues around the theme "Global Economic Revolution and the Resilience of the Built Environment in an Emerging World." The conference offered an opportunity to share best practices, theories, and concepts, fostering meaningful discussions that can shape future research and industry practices.

We were honored to have our distinguished keynote and guest speakers:

Prof. Kamuzhanje Joseph, Perch Inc. Development Consultancy Services, Zimbabwe.

Prof. Bldr. Sani Usman Kunya, Acting Vice Chancellor, Abubakar Tafawa Balewa University, Bauchi State, Nigeria.

Prof. Arc. Rajendra Kumah, Director of the School of Architecture and Design, Lovely Professional University, New Delhi, India.

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Dr. Ahmed Osman Ibrahim, Associate Prof. Architectural Engineering Dept., College of Engineering, University of Hail, Hail, Saudi Arabia.

Additionally, we extend our appreciation to the esteemed panelists that participated in the Round Table Talk on "Role of the Built Environment in Promoting Security Food Security (The Role of Building Integrated Agriculture [BIA]) in persons of Assoc. Prof. Dr. Habiba Atta (Nigeria), Assoc. Prof. Dr. Samuel Moveh (Latvia), LAr. Ts. Dr. Nurzuliza B. Jamirsah (Malaysia), Arch. Abdulmalik Aminu (Nigeria) and our amiable moderator, Asst Prof. Yakubu Aminu Dodo. The session with them on innovative architectural and urban design solutions for food security was insightful as it addresses pressing needs in the built environment.

With over 150 papers covering the twelve subthemes of the conference, SETIC 2024 was engaging and enriching experience. Through parallel sessions and poster presentations, participants had the chance to delve into key issues surrounding Global Economic Revolution and the Resilience of the Built Environment in an Emerging World. All attendees were believed to have made use of most of the discussions, collaborations, and networking opportunities available to them.

In closing, I would like to express my sincere gratitude to the Dean of the School of Environmental Technology, the Conference Organizing Committee (COC), and the entire School for their trust and support. To our reviewers and committee members, thank you for your dedication and hard work in making this event possible.

Wishing everyone the best and memorable experience as SETIC 2024 lives on in our heart.

Thank you, and God bless you all.

Assoc. Prof. Ogunbode E. B.
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SETIC 2024

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Selected papers from the conference proceedings will also be considered for publication in reputable academic journals.

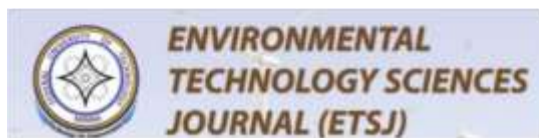
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Effect of Neighbourhood Crime on Residential Property Values: A review of the Literature

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Abstract

The effect of Neighbourhood crime has a detrimental effect on residential property values, often discouraging investment in residential real estate. This paper presents a review of empirical studies on the effect of neighbourhood crime on property values. The purpose of the review is to summarise current knowledge about the influence of neighbourhood crime on residential property value. The literature was rigorously sourced from platforms such as Emerald, ScienceDirect, SAGE, and Google Scholar. The findings reveal a consistent inverse relationship between property crime and residential property values, with higher crime rates leading to decreased housing prices across various geographic contexts, including Europe and developing economies. Proximity to crime hot spots and incidents of burglary and vandalism significantly reduce property values due to safety concerns among buyers. Methodologies such as hedonic pricing models and regression analyses were frequently employed. The review observed the limited focus on the effect of crime on residential property values in developing economies. It is recommended that further research be carried out on the impact of neighborhood crime on residential property values in developing economies to better understand the unique aspects of this social issue. Government and relevant agencies should also focus on this area of study, as it can contribute to promoting sustainable housing solutions that support healthier living environments.

Keywords: Crime, Neighbourhood, Residential Property, Property Value.

1. Introduction

Residential property serves a vital role in providing shelter while fulfilling psychological and economic needs. Globally, it remains a prominent investment option, considered less risky compared to other real estate assets due to its stability, consistent income, and liquidity (Waziri *et al.*, 2013; Nishani, 2016). The attractiveness of residential property as an investment is further enhanced by its potential for profitability and security (Olajide *et al.*, 2013; Adekunle and David, 2023).

Property value is defined as the estimated price a real estate asset would likely command in a fair transaction between knowledgeable and willing buyers and sellers (Nigeria Valuation Standards, 2019). Factors such as physical characteristics, economic conditions, government policies, and social dynamics influence property values (Olayonwa, 2012). However, challenges like urbanization, unemployment, and economic downturns have reduced the appeal of residential investments, with Neighbourhood crime emerging as a significant factor.

Neighbourhood crime such as burglary, theft, vandalism, robbery, and violent crime, affects property values by increasing insurance costs, security expenses, and instilling fear among residents (Andresen & Jenion, 2008; Roberts and Thompson, 2023). Studies from developed countries show that high crime rates lead to lower property values and disinvestment (Bogges *et al.*, 2013; Valez *et al.*, 2012). As a result, real estate stakeholders increasingly consider crime rates in property valuations (Pope and Pope, 2012).

In developing countries, however, investors often prioritize location quality and rental demand over crime rates, which can lead to poor investment decisions and a decline in property values (Aliyu *et al.*, 2017; Bello, 2011). This review examines how Neighbourhood crime affects residential property values and explores the management of crime-related risks in real estate markets.

2. Literature review

2.1 Concept of neighbourhood crime

A Neighbourhood refers to a sub-segment of urban or rural areas, such as cities, villages, or towns, where people live near each other and form communities. It is typically defined by physical or social characteristics that set it

apart from other parts of a settlement (Suttor, 2016). These geographic units are often marked by boundaries like streets, parks, rivers, and railways, and exhibit homogeneity in housing and structures (Adama and Jinadu, 2015). Neighbourhood crime, especially in residential areas, has been increasing globally (Tita *et al.*, 2006). Residential burglary, as defined by Ratcliffe (2001) and Moreto (2010), involves illegal entry into homes with intent to commit a crime. Other common crime include robbery, vandalism, street crime, and violent offenses, with theft and burglary often occurring during the day when homes are unoccupied.

An increase in crime negatively affects residents' sense of safety, leading many urban dwellers to relocate to safer areas (Tita *et al.*, 2006). This migration often results in concentrated poverty and ethnic enclaves in urban centers as people flee to the suburbs (Adegoke, 2014).

2.2 Factors influencing neighbourhood crime

Residential Neighbourhood crime is shaped by various social and environmental factors. Social risks like poverty, unemployment, juvenile delinquency, illiteracy, and homelessness significantly contribute to crime rates (Olajide *et al.*, 2017; Olajide *et al.*, 2022). Environmental design elements such as natural access control, surveillance, maintenance, and target hardening also influence crime levels (Zainol *et al.*, 2022). Issues like poor lighting, lack of pedestrian walkways, and inadequate landscaping can exacerbate access control problems, increasing crime risks (Othman *et al.*, 2020). Additionally, Neighbourhood features like accessibility, visibility, and crime patterns impact crime occurrences (Zhang *et al.*, 2022). Understanding these factors is crucial for developing effective crime prevention strategies in residential areas.

3. Materials and Method

The research design employed is a systematic literature review, chosen for its ability to synthesize scientific evidence and address specific research questions in a transparent way using well-evaluated topics (Lame, 2019). The search strategy for this systematic review used a combination of database searches, forward searches, and manual journal searches, relying on resources like Emerald, ScienceDirect, SAGE and Google Scholar, focusing on studies relevant to crime and housing prices in real estate investment. Many researchers prefer these resources as a search engine due to their ability to reduce publication bias. The journal selection process followed the updated guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), which includes three phases: identification, screening, and inclusion. From an initial pool of 81 identified and screened journals, 20 were selected for review as shown in figure 1 below:

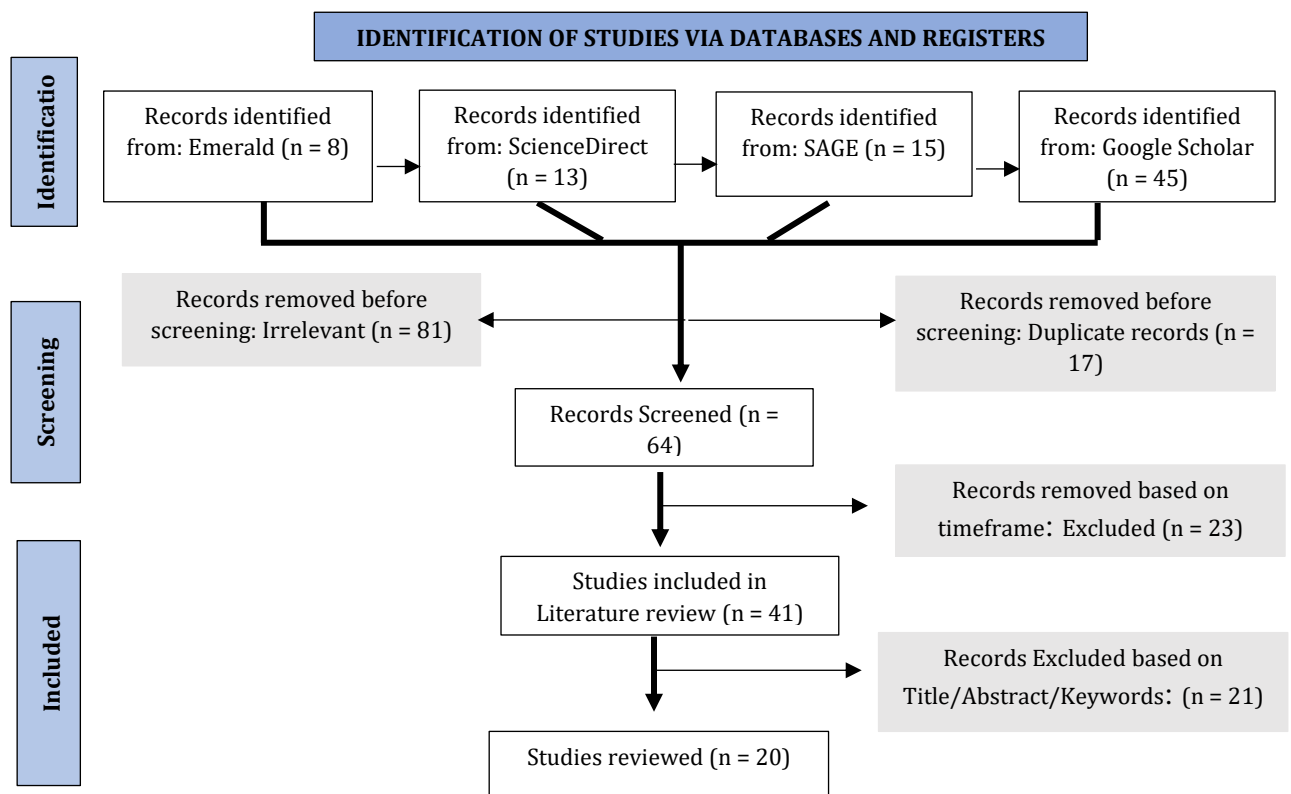


Figure1: PRISMA diagram for systematic reviews

4. Findings and Discussion

Exploring different variables commonly used in the literature is essential for understanding how crime affects residential property values. This review captures the variables and methodologies adopted in studies examining crime's impact on property values.

As shown in Table 1, approximately 20 articles from 2006 to 2023 were reviewed, supporting the theoretical findings that various factors significantly determine residential housing prices.

Table 1: Overview of Reviewed Studies

S/N	Author(s) and Year	Study Area/Continent	Sampled Residential Properties	Journal/Source
1.	Tita <i>et al.</i> , (2006)	Colombus	438	Journal of Quantitative Criminology
2.	Bello (2011)	Akure, Nigeria	174	FIG Working Week 2011
3.	Buonanno <i>et al.</i> , (2012)	Barcelona, Spain	1,653	Journal of the Institute for Advanced Studies
4.	Olajide and Lizam (2016)	South-Western State, Nigeria	467	International Electronic Scientific Journal
5.	Foryś and Putek-Szeląg (2017)	Szczecin	17,805	Real Estate Management and Valuation
6.	Thompson (2018)	Houston, Texas	532	University of New Mexico UNM Repository
7.	Senick (2018)	city of Akron, Ohio, USA	760	Honors Research Projects
8.	Owens <i>et al.</i> , (2019)	Southern California	278	Planning Malaysia Journal
9.	Angelov, <i>et al.</i> , (2020)	Pierce County, Washington	736	Issues in Information Systems
10	Bamiteko and Adebisi (2020)	Lagos, Nigeria	573	American Journal of Environmental and Resource Economics
11.	Ceccato and Wilhelmsson (2020)	Stockholm, Sweden	378	Nordic Journal of Criminology
12.	Feldkamp (2020)	Groningen, Netherlands	561	Riksuniversiteit Groningen FSS
13.	Banks (2021)	Franscistown, Botswana	467	Selinus University of science and literature
14.	Yang-Lu <i>et al</i> (2021)	China	434	Journal of Physics: Conference Series
15.	de La Paz <i>et al.</i> , (2022)	Los Angeles, USA	128,442	Journal of European Real Estate Research
16.	Kortas <i>et al.</i> , (2022)	Heerlen, Netherlands	335	Cities
17.	Olajide <i>et al.</i> , (2022)	South Western Nigeria	1,000	International Journal of Innovative Research & Development
18.	Koirala <i>et al.</i> , (2023)	North Carolina, USA	317	American Business Review
19.	Ekpo <i>et al.</i> , (2024)	Akwa Ibom, Nigeria	360	PM World Journal
20.	Odebode <i>et al.</i> , (2023)	Kaduna, Nigeria	152	International Journal of Housing Markets and Analysis

Table 2: Empirical studies on the impact of neighbourhood crime on residential property values

Author(s) and Year	Title	Variable Used	Methodology	Result(s)/Finding(s)
Tita <i>et al.</i> , (2006)	Crime and Residential Choice: A Neighbourhood Level Analysis of the Impact of Crime on Housing Prices	Intangible cost of crime, Crime rate and Housing prices	Hedonic regression	The findings imply that the average relationship between crime rates and home values may not be entirely accurate. According to our research, crime affects low-income, middle-class, and wealthy communities at different rates, with violent crime resulting in the greatest expenditures.
Bello (2011)	Impact of urban crime on property values in Akure, Nigeria	Crime rate and Rental values	Descriptive statistics and Multiple regression	The findings showed that the neighborhood's people had a negative opinion of living in high-crime regions and that there is an inverse relationship

				between property prices and the rate of crime. The results showed that crime imposes significant costs that extend beyond its direct expenses. In actuality, the valuation of neighborhoods rises by 0.57% for every standard deviation increase in perceived security.
Buonanno <i>et al.</i> , (2012)	Housing prices and crime perception	Housing market data and Victimization survey data	OLS and Quartile regressions	
Olajide and Lizam (2016)	Determining the Impact of Residential Neighbourhood Crime on Housing Investment Using Logistic Regression	Residential Property values and Residential neighbourhood crime forms.	Logistic regression and Hosmer & Lemeshow (H-L) test of goodness of fit	The results indicate that crime in residential neighborhoods can significantly affect property values in the study area.
Foryś and Putek-Szeląg (2017)	The Impact of Crime on Residential Property Value - on the Example of Szczecin.	Average unit price and Numbers of crime and offenses by type	Correlation analysis	The findings indicate that low-cost apartment neighborhoods associated with their location (transaction price) are associated with higher non-financial crime rates, and rising crime rates lead to falling market apartment unit prices.
Thompson (2018)	How the Proximity of Crime Impacts Housing Prices: A Hedonic Pricing Study of Inner-Loop Houston.	Housing sales, Neighbourhood characteristics and Crime data	Hedonic Pricing model	The findings showed that crime does, in fact, have a discernible effect on the price at which homes are sold, and that crime proximity matters. A decrease in the value of a home is caused by an increase in violent crime.
Senick (2018)	Welcome to the neighbourhood: A spatial analysis of crime and housing values.	Criminal arrest records and Housing sale data	Spatial analysis and Ordinary Least Square (OLS)	The findings showed that violent crime typically cause more damage than property crime, and that crime become more damaging the closer they are to a property.
Owens <i>et al.</i> , (2019)	impact of civil gang injunctions on crime and housing prices in the Southern California region	Zillow housing data, shapefiles and attributes related to gang injunctions, and crime data	Geographic regression discontinuity design	The outcome demonstrates each person's willingness to pay for the civil liberties that the injunction affects. The claim that gang injunctions are a financially viable method of reducing crime is called into question by the size of this net loss, which amounts to around 3% of property values between 2002 and 2015.
Angelov, <i>et al.</i> , (2020)	Using machine learning algorithms to analyze impact of crime on property values	Physical attributes of a property and Crime data	EM (Expectation Maximization) algorithm and Algorithm models	The findings showed that, in Pierce County, Washington, crime had a considerable impact on predicting the price at which residential properties will sell.
Bamiteko and Adebiyi (2020)	The study examined the influence of Neighbourhood security on housing price	Housing price and Crime rate	Ordinary Least Square (OLS)	The results indicate that fenced apartments, local security services, and the presence of gatekeepers positively influence housing prices in Lagos State, whereas high crime rates negatively impact those prices.
Ceccato and Wilhelmsson (2020)	The impact of crime on housing prices; a case study of the	Panel data on housing prices, crime statistics and	Hedonic pricing through multilinear	Based on the results, it was determined that vandalism and assault have the largest estimated effects on housing

Feldkamp (2020)	municipality of Groningen Do crime hot spots affect housing prices?	neighbourhood attributes. Property prices, Property attributes, and Crime variables	regression model Hedonic price model and Descriptive statistics	value, declining it by 0.0317% and 0.0816%, respectively. The findings showed that while crime rates do have an effect, it gets even more noticeable when one takes into account how far away a crime hot zone is. More specifically, a property moved 1 km away from a crime hotspot increases in value by more over SEK 30,000 (or roughly EUR 2,797).
Banks (2021)	Assessment of criminal activities on residential property values	Residential Property values and Residential neighbourhood crime	Logistic regression and Hosmer and Lemeshow (H-L) test of goodness of fit	The results indicate that crime in residential neighborhoods can significantly affect property values in the study area.
Yang-Lu <i>et al</i> (2021)	Crime Prediction: An Empirical Study on the Impact of Housing Prices on the Regional Criminal Rate.	Crime rate, Housing prices and Control variables such as economic indicator, demographic indicator and social governance indicators.	Linear regression model and a random effect model	The findings showed that employment opportunities, population density, and area economic development all had an effect on criminal activity.
de La Paz <i>et al.</i> , (2022)	The impact of crime on house prices in LA County.	Data on different type of crime, and Housing prices	Spatial analysis techniques and Correlation	The findings indicate a strong two-way relationship between crime and home transaction prices. The levels of drugs and violent assaults are endogenously inversely correlated with housing prices. The effect of distance is smaller (1000 meters) for drugs. The price response, however, indicates a positive correlation for burglary, vandalism, and non-aggravated assaults: the greater the price, the farther away the crime occurs.
Kortas <i>et al.</i> , (2022)	Urban Crime and Its Net Implicit Price to North Carolina Households	Crime rates, Wages and Rents	Regression estimates and Hedonic model	The average net marginal implicit price for residing in a city with a high rate of crime was found to be a negative value of \$51.80 per month. It appears from this negative value that households are receiving compensation for residing in high-crime cities.
Olajide <i>et al.</i> , (2022)	Exploring multi-scale variability in hotspot mapping: A case study on housing prices and crime occurrences	Geographical information on difference crime types and Housing prices	Geospatial analysis and Correlation analysis	The findings showed that, with the exception of home burglaries, all crime types had a consistent negative link with housing prices. The relationship between home burglaries and housing prices varied considerably in direction based on the hotspot maps' location and scale.
Koirala <i>et al.</i> , (2023)	The aim of the study is to examine the Socio-	Socio-Environmental Design Factors	Logistic regression and Structural	The result shows that implementing social development programs to address social risk factors and

	Environmental Design Factors (SEDeF) model for residential neighbourhood crime toward improving property value	(SEDeF), Residential neighbourhood crime rate and Residential property values	equation modeling (SEM)	deliberately modifying residential Neighbourhoods through architecture could significantly reduce crime in the area and increase property values.
Ekpo <i>et al.</i> , (2024)	The aim is to examined the impact of crime on rental values of residential properties	Rental values and Crime rates	Regression analysis	The outcome demonstrates a noteworthy inverse association between Ikono South's property values and crime rate. It is important to remember that high crime rates discourage potential residents and encourage those who can to relocate to neighborhoods with lower crime rates.
Odebode <i>et al.</i> , (2023)	Influence of urban violence on residential property rental value	Rental values and Various urban violence types	Regression analysis to test for variability and Correlation to test for the relationship	The findings showed that the rental value of residential property in the research region decreased as a result of urban violence in Kaduna metropolis, accounting for 21.6% of the observed variability.

Researcher's compilation

4.1 General discussion

The findings from the papers reviewed indicated a clear inverse relationship between neighbourhood crime and property values, revealing that higher crime rates correlate with lower property values and rental prices across different Neighbourhoods and in developing economies little attention has been given to research in this direction. Neighbourhood crime, such as burglary and vandalism, have been shown to consistently reduce residential property values across various geographic contexts. Studies indicate that proximity to crime hot spots significantly lowers property prices, as seen in Stockholm, Sweden, where moving a property just 1 km away from a crime hot spot increased its value by SEK 30,000 (EUR 2,797). Similarly, research in Heerlen, Netherlands, and Barcelona, Spain, revealed that property crime, particularly vandalism and burglary, lead to decreased housing values due to buyers' perceptions of safety. In Barcelona, a 1 standard deviation increase in perceived safety resulted in a 0.57% rise in property values, while properties in less safe areas saw a 1.27% reduction in price.

The impact of neighbourhood crime is not limited to Europe. In Lagos, Nigeria, neighborhoods with higher burglary rates saw significant reductions in housing prices, whereas secure neighborhoods commanded higher values. Similarly, in LA County, USA, complex relationships between neighbourhood crime and housing prices were observed, with burglary and vandalism negatively affecting property values. Overall, the presence of property crime drives down housing prices, as buyers tend to avoid areas perceived as unsafe, and the closer a property is to crime incidents, the more severe the impact on its market value.

5. Conclusion and Recommendations

The studies reviewed consistently demonstrate that crime has a significant negative impact on residential property values, with various methodologies revealing similar trends across different regions. Most studies found an inverse relationship between crime rates and property prices, particularly in areas with higher levels of violent crime, which tend to cause the greatest reduction in housing values. Factors such as proximity to crime hotspots, types of crime (e.g., vandalism, burglary, assault), and the perception of neighborhood safety also play crucial roles in shaping property values. Some studies highlighted that crime influences low-income and high-income neighborhoods differently, while others emphasized that social interventions and urban design improvements can mitigate crime's negative effects. Overall, the studies reinforce that reducing crime and improving neighborhood safety can positively impact real estate values, benefiting both property owners and prospective buyers. Based on the findings, it is recommended that Government and relevant agencies should focus on this area of study, as it can contribute to promoting sustainable housing solutions that support healthier living environments. And also invest in community policing initiatives and social development programs that address the root causes of crime, such as unemployment and social inequality.

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