Modelling the Socio-Economic Implications of Sustainability Issues in the Housing Market

A Stated Choice Experimental Approach
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Preface

Geometric changes in the world’s population and the ever-increasing pressure on the urban environment has necessitated the application of sustainability principle for the utilization of resources. The sustainability paradigm is aimed at meeting the present demands without sacrificing the ability to meet future needs. More than half of the world population currently resides in cities with a projection of about 66% in the year 2020. Africa accounts for more than 90% of the upsurge in this urban population that may result in overcrowding of cities, social exclusion, crime, stiff competition for urban land, traffic congestion, amongst others. It is, therefore, vital that African cities are dynamic enough to engage the new challenges for efficiency and sustainability.

Despite the global call to an inclusive, safe and resilient human settlement as contained in the Sustainable Development Goal (SDG) 11, a majority of the countries in the Global South are yet to key into the vision. This book conceptualizes sustainability issues in urban areas as a complex issue affecting the urban dynamics, housing market and human interface with the environment. With the SDG as a focus, the key issue discussed in this book is the location of graves within private residences, cemetery in proximate location to private residences and the implication of such practices on renters’ choice and rent. The context of the study is limited to the African housing market, with selected cases from Nigeria. The theme of this research book posits a comparison with the experience of American cities to offer insights into the way forward. The intention is to adapt the lessons learnt to address land use issues in the Global South.

The research reported in this book applies a pragmatic approach by employing the Stated Choice Method to collect and analyse housing choice and price data. The approach is necessary to address sustainability issues in the housing market. The research book will be of benefit to the policymakers, who have impliedly tackled
the land issue from an economic perspective that lacks social context. It will also benefit urban planners, investors in residential housing and land economist.

The authors hereby affirm that the text in this book contains their original idea and quotation from previous studies were appropriately referenced.

Johannesburg, South Africa

Solomon Pelumi Akinbogun
Clinton Aigbavboa
Trynos Gumbo
Wellington Thwala
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About the Authors

Dr. Solomon Pelumi Akinbogun is a Postdoctoral Research Fellow at the Department of Construction Management and Quantity Surveying at the University of Johannesburg, Republic of South Africa. He is also an Academic at the Department of Estate Management, School of Environmental Technology, Federal University of Technology, Akure Nigeria. Dr. Akinbogun obtained his Ph.D. in June 2015 at the Institute for Housing, Urban and Real Estate Research of the School of Energy Geoscience Infrastructure and Society (formerly known as School of Built Environment), Heriot-Watt University, Edinburgh United Kingdom. Prior to that, he got his B.Tech. (Hons) and M.Tech. in Estate Management from Federal University of Technology Akure Nigeria in the Year 2001 and 2007, respectively. His research focus is domiciled in real estate economics and provides a narrative of the implications of externality on housing choice and property values. He has published articles in this regard in several top journals. Dr. Akinbogun is a reviewer to reputable refereed journals such as the International Journal of Housing Market and Analysis, Journal of Facilities Management, etc. He is a member of the Royal Institution of Chartered Surveyors (RICS) and the Nigerian Institution for Estate Surveyors and Valuers.

Clinton Aigbavboa is a Professor at the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa. Before joining academia, he was involved as a quantity surveyor on several infrastructural projects, both in Nigeria and South Africa. Professor Aigbavboa is the immediate past Vice Dean of the Faculty of Engineering and Built Environment, University of Johannesburg, South Africa. He is a strong academic with extensive knowledge in practice, research, training and teaching. He is currently the Chair of Sustainable Human Settlement and Construction Research Centre at the University of Johannesburg. He is also an author of five research books that were published with Springer Nature and CRC Press. He is currently the Editor of the Journal of
Construction Project Management and Innovation (accredited by the DoHET) and has received national and international recognition in his field of research. The South Africa National Research Foundation rates him as a Young researcher with the potential of establishing himself within a 5-year period.

Prof. Trynos Gumbo is currently an Associate Professor and Head of the Department of the Urban and Regional Planning within the Faculty of Engineering and the Built Environment at the University of Johannesburg (UJ). He holds a Ph.D. from Stellenbosch University, South Africa as well as masters and honours degrees from the University of Zimbabwe (UZ), Zimbabwe. He has previously worked in the Africa Institute of South Africa of the Human Sciences Research Council as a research specialist and Acting Head for the sustainable development programme. Professor Gumbo has also worked as an international instructor in the urban management masters programme within the Ethiopian Civil Service University College (ECSUC) in Addis Ababa in Ethiopia. Before, Prof. Gumbo had worked as lecturer and Head of Department at the National University of Science and Technology (NUST) in Zimbabwe. He has attended and presented at several national and international conferences and has published widely in a variety of research areas that include informality, housing, urban planning, development and management. His research interests include urban transportation planning and management, sustainable and smart cities development, housing and economic informality, green economy and renewable energy generation from waste and innovative building technologies and materials.

Wellington Thwala is a Professor at the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa. He is the immediate past Head of the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa. Currently, he is the Chair of SARChI in Sustainable Construction Management and Leadership in the Built Environment, FEBE, University of Johannesburg, South Africa. He offers research support and advice on construction-related issues to the Construction Industry in South Africa and the government. Professor Thwala has extensive experience in providing consultancy for project leadership and management of construction projects and teaching project management subjects at the postgraduate level. He has extensive industry experience with a research focus on sustainable construction, leadership and project management. He is the Editor-in-Chief of the International Journal of Construction Project Management and Innovation. He also serves as an editorial board member to various reputable international journals.
## Acronyms

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<th>Acronym</th>
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<tr>
<td>ACA</td>
<td>Adaptive Conjoint Analysis</td>
</tr>
<tr>
<td>ACBC</td>
<td>Adaptive Choice-Based Conjoint</td>
</tr>
<tr>
<td>CAFO</td>
<td>Confined Animal Feeding Operation</td>
</tr>
<tr>
<td>CAPI</td>
<td>Computer-Assisted Personal Interview</td>
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<tr>
<td>CBC</td>
<td>Choice-Based Conjoint</td>
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<tr>
<td>CE</td>
<td>Choice Experiment</td>
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<td>CM</td>
<td>Choice Modelling</td>
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<td>CV</td>
<td>Contingent Valuation</td>
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<td>CVA</td>
<td>Full Profile Conjoint Analysis</td>
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<td>GRA</td>
<td>Government Residential Area</td>
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<tr>
<td>HB</td>
<td>Hierarchical Bayes</td>
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<td>HP</td>
<td>Hedonic Pricing</td>
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<tr>
<td>IIA</td>
<td>Independent Irrelevant Alternative</td>
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<tr>
<td>LUST</td>
<td>Leaking Underground Storage Tank</td>
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<tr>
<td>MNL</td>
<td>Multinomial Logit Model</td>
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<tr>
<td>PRS</td>
<td>Private Rental Sector</td>
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<tr>
<td>RLH</td>
<td>Root Likelihood</td>
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<td>RP</td>
<td>Revealed Preference</td>
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<td>SP</td>
<td>Stated Preference</td>
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<tr>
<td>WTA</td>
<td>Willingness to Accept</td>
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<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
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**Definition of Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Main effect</td>
<td>The effect of one level while ignoring the level of other factor</td>
</tr>
<tr>
<td>Interaction effect</td>
<td>The influence of one level on another (the difference of difference)</td>
</tr>
<tr>
<td>Zero centre part worth</td>
<td>A code for measuring the attributes’ performance, where all utilities/effects within each attribute’s levels sum up to zero</td>
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Chapter 1
General Introduction

1.1 Background to the Study

Residential housing occupies a prime position at the centre of man’s socio-economic life. This earns it a prominent position in the scheme of global agenda for human welfare, health, survival micro- and macro-economic development. Global attention to this exemplifies various attempts to ameliorate the qualitative and quantitative issues surrounding its provision by governmental and non-governmental organizations. The establishment of UN-Habitat and its provision of technical and normative assistance on housing development, the World Economic Forum “Housing for All” agenda and the International Human Rights proclamation of housing as an inherent right of every man exemplifies the priority of residential property. Even if the broader net effects of the campaign for housing are unclear, public policy in many OECD Nations is geared towards enhancing homeownership through preferential tax treatment of housing investment and alleviated credit constraint of the financial market. A similar course of action for homeownership promotion in the developed world are also visible in the developing nations. Despite all the attempts to increase the access to housing, a huge number of households are unable to own a house due to the huge capital commitment (Quigley and Raphael 2004). However, the housing market offers a range of other options of which lease is prime. This makes the rented sector especially the private rented sector a key factor to affordable housing in the market.

Regardless of the socio-economic status, it is the fundamental right of every household to reside in a house that optimizes social welfare. Despite this, tenants’ rights to a healthy housing may be thwarted if market regulatory mechanisms fail to prevent a negative externality and sustainability issues. This may happen when the action of a property owner constitute negative externality on the tenants and neighbours. From a remarkable intellectual convergence, several studies such as Marshall (1885), Pigou (1920) and Coase (1937) argue that negative externality is a product of market failure. Evidently, many of the previous and recent publications on negative externality in the housing market focus on three notable directions.
The First group includes but not limited to the works of Ebong (1983), Wahab et al. (1990), Muoghalu (1991), Olayiwola et al. (2006), Jiboye (2009), Ibem and Amole (2012), Amao (2012), Amao and Ilesanmi (2013) and others. These studies largely conceptualize negative externality on structural conditions to examine housing quality. Building upon the aftermath effect of the qualitative problem of housing, many studies have established a link between poor residential quality and health concerns, well-being and quality of life. This is evident in the studies carried out by Wilkinson (1999), Shaw (2004), WHO (2008) Commission on Social Determinants of Health, Scottish Government (2008), Gibson et al. (2011) and Bowie (2013).

For instance, motivated by the health concern of living in a poor quality apartment, Gibson et al. (2011) provide an insight into the understanding of the psychosocial impacts of the housing type. Similarly, Petticrew et al. (2009) report a significant improvement in the health and well-being of households that moved home within a year from housing affected by noise externality and dampness in Scotland. The excerpt below described improvement in well-being in one of the respondents.

Well, I’ve not been admitted to the hospital since I’ve come round here, I’m a lot healthier than what I used to be. As I say, I’ve got more freedom of movement because I’m getting into fresh air a lot more, which is probably helping as well (Petticrew 2011).

The second group of studies build on the problem of poor housing quality to measure households’ satisfaction. Empirical studies in this regard are evident in the works of Ogu (2002), Oladapo (2006), Ilesanmi (2012), Ibem and Aduwo (2013) and others. The third group of literature is quite analytical, they examine and quantify the effect of the specific environmental and structural condition that affects residential choice and WTP on the impacted property (see Chap. 4 for details).

Noticeably, most of the studies carried out in this regard in Nigeria provide insight into possible cases of a negative externality in the Nigeria property market. However, many of them are based on an observational study with rhetoric in the literature on housing quality and the cluttering of disparate issues in the residential property market. Therefore, the need to examine the fundamental disparate issues, analyse their influence on property value and choice are essential. Negative externality affects sustainability and manifests in a large number of ways, most of the studies that examine their impact on residential property value generally show a loss but with varying significance. Firstly, in certain cases, findings from some studies reveal persistence loss in value and perceived unattractiveness of impacted property even after post-remediation clean up. Extending this argument, empirical studies carried out by Dale et al. (1999), Hurd (2002), McCluskey and Rausser (2003), and Man and Wong (2012) show that both temporary and long-term stigma are possible equilibrium outcomes after the discovery and cleanup of an impacted site in Dallas, Los Angeles, Hong Kong and Houston.

Secondly, in a few cases, there are differing opinions on households’ perception of negative externality and its impact on property value. Boyle and Kiel (2001) carried out a meta-analysis on the impact of the negative externality of air pollution and water quality on property value. Findings reveal that air externality generates mixed results with the assumption that homeowners are not aware of the factors of
interest. On the other hand, the impact of water pollution shows a consistent loss in residential property value. In a study of the impact of High-voltage transmission lines (HVTL) by Pitts and Jackson (2007), no significant effect was recorded of its impact on nearby residential property value. These studies analyse actual sales data collected from homeowners that presumably bought a house without any awareness of a negative externality. This provides an insight on the need to carry out a study with a context-specific sustainability issue, where households have sufficient information on the variable of interest that might affect their choice and Willingness To Pay (WTP). The variable of interest in this book is a grave, which has received little attention is housing economics literature.

In ancient times, Romans and Jews believed that graves, cemeteries are unsanitary and hazardous; hence, they are located outside the cities (Engelbrecht 1998). Engelbrecht noted that the location of cemeteries within residential areas creates hygiene problems. Arguing from a similar contextual stance, the English General Board of Health Report reveals that groundwater pollution from cemeteries is one of the main causes of cholera in the early 1800s (Bachelor 2004). In Nigeria, Medical experts discovered Lassa fever epidemic in Ose and other urban centres are traceable to the location of graves within residential properties. The chief vector of this disease “rat” burrows into graves of infected corpses to feed on them and later spread the disease by feeding on domestic foodstuffs (OSRC 2009). One of the health hazards of the location of a cemetery within residential properties recorded in a study carried out in the United States by Spongberg and Becks (2000) and Guttman et al. (2012) shows that graves contain harmful chemical compounds. The chemical arises from the decomposition of corpses and funeral artefacts released to the surrounding groundwater. The threat of this danger becomes a major source of concern in an economy where the majority of the households depend on groundwater supply. Typically, shallow wells are the main source of domestic water for most households. For instance, 1.82% of the households in Akure have access to pipe-borne water from the public mains (NPC 2006). Consequently, over 98% of the residents are susceptible to health risk and loss of social welfare. A similar study carried out by Larsen and Coleman (2010) in Ohio buttresses the previous finding by reporting that residential properties located close to a graveyard are psychologically impacted with health risk to nearby underground water. They stressed that such properties are rarely high-end properties and take a longer time to find a would-be renter or purchaser.

In spite of the dangers of graveyards to housing in a proximate location, graves are popularly located within private residences in Nigeria and other African countries. Currently, the growing numbers of graves on residential properties in many urban areas challenge the socio-economic future of many Nigerian cities. The characters of most Nigerian streets are changing, it is now common to find many slogans like; Rest in Peace (R.I.P), Adieu Papa, the Soul of the Faithful Rest Here and others boldly written on residential properties. Similarly, after burial services, a statement like, interment follows immediately at the deceased residence is common. This book applies a stated preference method to model the socio-economic effect of the externality of a grave on residential choice, rent and WTP for a grave impacted housing in the private rented sector (PRS). Also, the world steps up action on zero risks to
the disposal of hazardous waste, the current use of the residential property for grave creates a doubt on the efficiency of the property market and its regulatory framework with specific reference to delivering socially satisfying homes to tenants. Against this backdrop, the study seeks to answer four intriguing research questions.

- What is the impact of a grave on tenants’ residential choice? All things being equal, a residential property will let at its full rental value in the open market but this is doubtful with the location of a grave on it. This leads to the second and third question stated below.
- What is the possible loss in the rent of a residential property with a grave?
- How acceptable is the neoclassical economics solution to the negative externality of a grave on a residential property?
- How effective is the Burial on Private Premises Law?

1.2 Purpose and Objectives

Studies on the impact of a negative externality such as noise annoyance, oil spillage, confined animal, waste dumpsite and feeding operations are many in the literature. There focus was mainly on the willingness to pay for the impacted properties. These studies have provided substantial information about the issues, particularly in the developed world. This book is not written to replicate the previous research efforts. The purpose is to develop a choice model that offers an empirical and theoretical understanding of the externality of a grave in the residential market. Within this broad aspiration, it investigates three interrelated problems of choice, Willingness To Pay (WTP) and a market regulatory mechanism. In order to achieve this aim, the study sets out to examine the following key objectives which shape the direction of other chapters in the book.

i. Tenants’ choices among a discrete set of housing alternatives with a grave and without it.
ii. Tenants’ WTP for a house with a grave.
iii. The importance of a grave to a tenant’s housing choice decision.
iv. Model and sensitivity of residents to a discount in rent in a house with a grave.
v. Legal implications of the location of a grave on a private house.

1.3 Organization of the Research

This book contains nine context-specific chapters. One discusses the introduction to the research. It provides explanations on the statement of the research problem, purpose and objectives. Chapter 2 presents a review of land administration, which is fundamental to the nature and success of the residential property market in Nigeria. Chapter 3 examines the Nigerian property market and its efficiency. Chapter 4 presents a review on the concept of negative externality and examines both the