SUSTAINABLE LIVABLE HOUSING ASSESSMENT MODEL
FOR TRADITIONAL URBAN AREAS IN NIGERIA

MUSIBAU LUKUMAN

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requirements for the award of the degree of
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DEDICATION

To
my beloved family,
Muslim Ummah, and
the Poor across the globe, for I foresee a change not sooner than now.
ACKNOWLEDGEMENT

To ALLAH, Al-Awwal and Al-Akhir, be the Glory for transforming this dream into fruition.

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I thank Federal Government of Nigeria and The Federal Polytechnic Ede, Nigeria for the opportunity and privilege.

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To all individuals sent by ALLAH in this PhD sojourn, I am eternal grateful.
Sustainable livable housing entails meeting residents’ housing needs and well-being in terms of housing condition, facilities, safety and psychology. Reports and studies revealed that about 863 million people in developing countries live in slum, with 61.7% of this is in Africa. In Nigeria, approximately 75% of people living in urban areas live in poor housing conditions, manifested by overcrowding, poor urban living conditions, low facilities and high crime rates. At present, the absence of sustainable livable housing (SLH) assessment index for traditional urban areas (TUAs) has caused difficulties in determining housing that suits and meets the needs of the TUAs residents. The assessment index is critical in achieving housing-related target of Sustainable Development Goals (SDGs) that concerns with sustainable cities and communities on or before 2030. The main purpose of this study is to establish SLH assessment index toward improving TUAs housing condition in Nigeria. The first objective is to determine attributes and their indicators for assessing SLH according to their importance for TUAs. The second objective is to examine significant relationship between identified attributes and their indicators with SLH to establish structural model. The third objective is to develop SLH assessment index toward improving housing living condition in the TUAs. In achieving the first objective, the researcher carried out literature review, focus group discussions (FGDs), experts’ validity survey and TUAs resident field survey in Osun State, Nigeria as well as undertaken quantitative analysis. Seven identified attributes and their 36 indicators were found relevant and important. These findings were then subjected to further analyses such as measurement model, structural model and important performance matrix analysis (IPMA) using partial least square-structural equation modelling (PLS-SEM), to achieve the second objective. Five attributes namely housing units, security and safety, facilities and services, community and neighbourhood, and economic development emerged as significant. These 5 significant attributes and their 27 indicators were utilized to achieve Objective 3 i.e. developing SLH assessment index (SLHAI) that is suitable for TUAs housing assessment, based on resident needs and perspectives in Nigeria. The result of the SLHAI validation and testing in Ile-Ife, Iwo and Osogbo TUAs, Osun State, Nigeria revealed that housing in study areas has been assessed as fair and scarcely suitable for participants’ housing need and requires improvements. Conclusively, the assessment index developed has shown aspects from which the improvement activity should commence; as such this study has successfully met its purpose.
ABSTRAK

Kelestarian perumahan boleh huni melibatkan keperluan dan kesejahteraan penghuni perumahan dari aspek keadaan rumah, fasiliti, keselamatan dan psikologi. Laporan dan kajian menunjukkan bahawa kira-kira 863 juta orang yang berada di kawasan negara-negara membangun adalah tinggal di kawasan mundur dengan 61.7% daripadanya berada di Afrika. Di Nigeria, kira-kira 75% penduduk yang tinggal di kawasan bandar tinggal dalam keadaan perumahan yang buruk, dalam keadaan kesesakan, suasana kehidupan bandar yang mundur, perkhidmatan fasiliti yang rendah dan kadar jenayah yang tinggi. Pada masa ini, ketiadaan indeks penilaian kelestarian perumahan boleh huni (SLH) untuk kawasan bandar tradisional (TUA) telah menyebabkan kesukaran dalam menentukan perumahan yang sesuai untuk memenuhi keperluan penduduk TUA. Indeks penilaian adalah kritikal dalam mencapai Matlamat Pembangunan Mampan (SDGs) yang berkaitan dengan bandar dan komuniti lestari pada atau sebelum tahun 2030. Tujuan utama kajian ini adalah untuk menyediakan indeks penilaian SLH ke arah penambahbaikan terhadap perumahan di kawasan TUA di Nigeria. Objektif pertama adalah untuk menentukan atribut dan penunjuk mereka untuk menilai SLH mengikut kepentingannya bagi TUA. Objektif kedua adalah untuk mengenal pasti hubungan yang signifikan antara atribut dan penunjuk SLH ke arah pembentukan model struktur. Objektif ketiga adalah untuk membangunkan indeks penilaian SLH ke arah menaikan tahap kehidupan penghuni di TUA. Untuk mencapai objektif pertama, penyelidik telah menjalankan kajian literatur, perbincangan kumpulan fokus (FGD), tinjauan kesahihan pakar dan penyebaran soal selidik di kalangan penduduk di Osun State, Nigeria serta menjalankan analisis kuantitatif. Tujuh atribut yang dikenal pasti dan 36 penunjuk didapati relevan dan penting. Dapat ini kemudiannya dikaitkan dengan analisis lanjutan melibatkan model pengukuran, model struktur dan matrik analisis pencapaian utama (IPMA) dengan menggunakan separa ganda dua terdikit berasaskan model persamaan struktur (PLS-SEM) untuk mencapai objektif kedua. Lima atribut iaitu unit perumahan, keselamatan, fasiliti dan perkhidmatan, komuniti dan kejiranan, dan pembangunan ekonomi merupakan atribut yang penting. 5 atribut dan 27 penunjuk digunakan untuk mencapai objektif ketiga iaitu membangunkan model indeks penilaian SLH berasaskan keperluan dan perspektif penghuni TUA di Nigeria. Hasil pengujian dan validasi model SLHAI di Ile-Ife, Iwo dan Osogbo TUAs, Osun State, Nigeria menjelaskan bahawa keadaan perumahan di kawasan kajian telah dinilai pada tahap sederhana dan hampir tidak sesuai untuk keperluan perumahan peserta dan memerlukan penambahbaikan. Secara keseluruhan, indeks penilaian yang dibangunkan telah menunjukkan aktiviti penambahbaikan harus dilaksanakan; Oleh itu, kajian ini telah berjaya mencapai matlamatnya.
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<tr>
<td>ACEM</td>
<td>Association of Consulting Engineers Malaysia</td>
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<tr>
<td>AVE</td>
<td>Average Variance Explained</td>
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<td>BAS</td>
<td>Building Assessment System</td>
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<tr>
<td>BREEAM</td>
<td>Building Research Establishment Environmental</td>
</tr>
<tr>
<td>CAR</td>
<td>Cronbach’s Alpha Reliability</td>
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<tr>
<td>CB-SEM</td>
<td>Covariance-Based Structural Equation Modeling</td>
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<td>CEPAS</td>
<td>Comprehensive Environmental Performance Assessment Scheme</td>
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<td>CR</td>
<td>Composite Reliability</td>
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<td>EFA</td>
<td>Exploratory Factor Analysis</td>
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<td>FCT</td>
<td>Federal Capital Territory</td>
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<td>FGD</td>
<td>Focus Group Discussion</td>
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<td>GBCA</td>
<td>Green Building Council of Australia</td>
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<td>GBI</td>
<td>Green Building Index</td>
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<tr>
<td>GPRS</td>
<td>Green Pyramid Rating System</td>
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<tr>
<td>GSCA</td>
<td>Generalized Structured Component Analysis</td>
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<tr>
<td>GSRS</td>
<td>Green Star Rating System</td>
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<td>GSRS</td>
<td>Green Star Rating System</td>
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<td>HQE</td>
<td>High Environmental Quality</td>
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I-CVI - Items Content Validity Index
IFC - International Framework Committee
IPMA - Important Performance Matrix Analysis
LEED - Leadership in Energy and Environmental Design
LCA - Life Cycle Assessment
MDGs - Millennium Development Goals
NEUSREL - Nonlinear Universal Structural Relational Modelling
PLS-SEM - Partial Least Square Structural Equation Modeling
RII - Relative Important Index
SAGS - South African Green Star
S-CVI - Scores Content Validity Index
SD - Sustainable Development
SDGs - Sustainable Development Goals
SLH - Sustainable Livable Housing
SLHAI - Sustainable Livable Housing Assessment Index
SPSS - Statistical Package for Social Sciences
TUAs - Traditional Urban Areas
UK - United Kingdom
USA - United State of America
UTM - Universiti Teknologi Malaysia
WHO - World Health Organization
## LIST OF APPENDICES

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Housing is more than mere roof over residents’ head. It a basic component of man settlement that satisfies his essential need and has fundamental influence on his welfare, health, quality of life and productivity. Today, housing plays central role in its residents’ wellbeing, security and safety leading to the psychological and physical health on one hand. It is ranked next to food in the hierarchy of human needs. Mainly, housing performs three purposes needed by man, namely; physical (providing security and shelter), psychological (providing sense of personal privacy and space) and social purposes (providing communal area and gathering space for basic unit of family and society). In some societies, it accomplishes economic needs serving as commercial and production center. Housing, however, plays an important role in employment generation, wealth creation, sustainable environmental, natural disaster mitigation, economic and physical development (Erguden, 2001; Boehm and Schlottmann, 2001; UN-Habitat, 2006a) as well security of wealth and lives amongst others (Hirschfield et al., 2014; Mohit and Elsawahli, 2010; Rabe and Taylor, 2010).

Studies and reports affirmed that decent housing is not accessible, to urban residents across the globe particularly developing nations, at reasonable cost or price (Tipple, 2004; UN-Habitat, 2006a; Greene and Rojas, 2008) and was recently reported by UN-Habitat (2015) as shown in Figure 1.1. Thus, many urban residents resolved to lives in poor housing conditions and low quality housing that constitute an affront to
human dignity (UN-Habitat, 1989, 2008, 2013a, 2013b, 2015). These housing are characterized with lack of housing facilities, services and infrastructure such as: readily available drinking water, primary health cares, waste disposal facilities, sewage facilities to dispose human wastes hygienically as such waste, its water and human excreta ends up untreated in channels, gullies, canals, streams and rivers (Choguill, 2007; Doling et al., 2013; Franklin, 2012; Jiboye, 2011c; Nour, 2011; Olotuah and Bobadoye, 2011; Olotuah and Taiwo, 2013; Walley, 2010; William, 2013). Hence, these housing have awful environmental, social, health and economic implications (Coker et al., 2008; Cotton and Tayler, 1994; Opara, 2003; Rondinelli, 1990; UN-Habitat, 2006b; UNFPA, 2007).

Figure 1.1: Housing gap across major cities of the world
Source: Adapted from UN-Habitat (2015)

From Figure 1.1, it is instructive note that Lagos, Nigeria, belongs to low income group country with over 11 million population and housing affordability gap approximately 15% of GDP. However, living in housing unit, especially one that meets
its residents needs, is a fundamental human right, thus, livable housing. Then, livable housing is a place or housing to be, one that is attractive, affordable, safe, environmentally sustainable, culturally inclusive, socially cohesive and diverse housing connected to local shops, education, employment, public open space and leisure, health facilities, community services, and cultural opportunities; through walking, cycling infrastructure and convenient public transport (Lowe et al., 2013). Accordingly, housing livability shows the wellbeing of an area and entails characteristics that make an area or a place where individuals want to reside and stay now and possibly in the future (Competition, 2008). Therefore, concept of livable housing needs an understanding to synergistically and effectively deal with pressing issues such as climate change, slums prevention, human and economic development.

As a concept in the literature, livability has been linked, emerged together and associated with sustainability. As such, housing is not truly livable except it is sustainable (Chazal, 2010). Available literature and reports revealed that sustainability or sustainable development was brought into the fore by World Commission on Environment and Development (WCED) to meant development conducted to meets present needs without depleting future generations’ ability to meet their own needs (WCED, 1987; Burton, 1987). It was mainstreamed and progressively developed through the United Nations Conference on Environment and Development (1992) in Rio, Rio+20 Conference 20 years after (2012) with outcome document named the future we want and to just concluded 70th UN General Assembly in September 2015 that gave birth to Sustainable Development Goals (SDGs), otherwise known as Global Goals, signed by 193 nations, to be operational for 15 years spanning till 2030 towards dignity, justice, people, partnership, prosperity and planet.

Specifically, housing related target of the Global Goals concerns with sustainable cities and community and focuses on ensuring access to safe, adequate and affordable housing linked with basic facilities and services as well as upgrade slums for residents on or before 2030 (SDG 11, Target 11.1). This housing related target has measurable cross-cutting indicators such as percentage of eligible population using: safely managed water services, basic sanitation services, modern cooking solutions, reliable electricity, living in slums or informal settlements, urban solid waste
management amongst others. This implies that solving housing related problems will solve many problems in relation to poverty, hunger, healthy living, sanitation, economic growth, foster innovation, inequality within country, cities and human settlements. Hence, the time for sustainable livable housing is now, especially in the traditional urban areas of developing nations across the globe.

At present, absence of sustainable livable housing (SLH) assessment requirements, particularly, for traditional urban areas (TUAs) has caused difficulties in determining housing that suits and meet the needs of the TUAs residents. Having SLH assessment index is critical in determining housing that suits and meet the needs of the TUAs residents on one hand and achieving target 11.1 of Goal 11 of the Global Goals especially toward TUAs upgrade in developing countries. This is identified as a gap. In line with human practise which seeks to explore and investigate, identify and describe, analyse and establish, develop and validate as well as proffer solutions to ameliorate defects in human housing complexities, this study seeks to fill this identified gap.

This research is constructive in nature and set to develop SLH assessment index based on residents’ needs in relation to housing complexities in the TUAs. Also, it examines opinions of TUA residents on interventions required to ensure SLH through improve housing living condition using bottom-up approach, specifically progressing from small and affordable interventions to highest interventions. The study benchmark SLH attributes and its indicators based on their importance to the TUAs residents because of the residents’ and TUAs (brown areas) peculiarities. The SLH assessment index shall vary significantly from what is obtainable in other part of urban areas (green areas). Variability shall occur in term of: what is measured, how important are attributes and indicators measured; how it is measured and how the results are presented and interpreted.

In the light of foregoing and the need for sustainability in livable solution, this research focuses on improving the existing housing units to the need and expectation of the residents. For example, solving residents’ housing problem without necessarily
demolishing houses in the TUA. It seeks to clarify related issues to definition and operationalization of SLH for TUA with understanding that individuals or households’ needs are unlimited, difficulties in enforce limit to their needs and need for them to set limit to their needs. The research is about how to recognize and assess whether housing in TUAs is livable and sustainable in the short and medium term for its residents (urban poor). Also, it is about how to try and balance these aspects and how this contributes to our understanding of SLH for TUA in developing country like Nigeria.

1.2 Background of the Study

In assessing building, there are various building assessment rating tools to ensure that existing and new buildings, most especially housing, are designed, built, functioned and maintained based on sustainable development (SD) principles. For instance, United Kingdom’s BREEAM (Building Research Establishment Environmental Assessment Method), Australia’s GSRS (Green star rating system), United States of America’s LEED (Leadership in Energy and Environmental Design), Green Pyramid Rating System (GPRS) in Egypt, South African Green Star (SAGS) in South Africa, Green Mark in Singapore, High Environmental Quality (HQE) in France, Malaysia’s GBI (Green Building Index) and Hong Kong’s CEPAS (Comprehensive Environmental Performance Assessment Scheme).

From the literature, most of these building rating tools are concentrating on design aspects, certification procedure and building technology (Poveda and Young, 2015; Ding, 2008). To Cole (2005), building design potential and intentions were evaluated through prediction instead of actual building performance. Majority of these rating tools fail to consider operation, functionality and maintenance of the existing or completed building is operated and maintained. Really, building assessment always concerned majorly with material selection, design, construction and building technology such as systems and equipment to ensure building certification. Thereby disregarding operations, functionality and maintenance aspects despite their significant effect on building operation expenses and life span. Also, majority of building owners request for certification of their buildings only at design phase (Green
Prospects Asia, 2012). Specifically, no preferences thereafter for sustainable livable assessment of existing domiciled housing units.

However, sustainable livable assessment of existing resided housing units or buildings entails determination of interaction between housing units and its residents. To Khalil and Nawawi (2008), this is aimed at making improvement where and when necessary. Moreover, SLH assessment is people behaviour oriented such as; needs, perception, satisfaction and experience. in relation to their housing units or building’s physical, environmental and management attributes (Wheeler et al., 2011). However, little consideration was given to housing or building assessment with little or no attentions being given to housing units in TUAs. This could result to avoidable failure in respect of housing units or residential properties in TUAs. Therefore, residents’ involvement and consideration for their needs are very important in assessing sustainability in livable housing in the TUAs especially in developing countries.

From the foregoing, there are strong indications for SLH study because actual housing performance mostly differs from early design intension as its ages (Djebarni and Al-Abed, 2000). And, there is need to ensure that responsible factors for variation factors are identified in housing performance due to usage (Kaatz et al., 2005). Then, it could be deduced that majority of existing assessment rating tools focuses on the building at the development stage with little or no preferences for housing or building assessment due to usage and as its ages. Also, all existing building rating tools do not cover assessment of housing in the TUAs in the developing countries. Hence, there is need for SLH assessment index (SLHAI) to provide a guide in assessing housing periodically to identify pitfalls and prospects as well as improving overall housing living condition in the TUAs.
1.3 Statement of the Problem

There are 7.2 billion human beings on the earth, about 9 times of 800 million persons estimated at the beginning of industrial revolt in 1750. It is projected to be 8 billion in 2020, and possibly 9 billion in 2040s (Sachs, 2015a; 2015b). These billions of human beings are searching for their footing in the global economy. Specifically, poor amongst them are struggling for safe water, food, housing, health care and other basic needs needed for mere subsistence and survival (Sachs, 2015b) while the ultra poor face daily critical challenges of unsafe housing, lack of safe drinking water and sanitation, lack of health care, insufficient nutrition (Sachs, 2015a). Accordingly, it is estimated that more than 90% of urbanization is taking place in developing nations. Specifically, UN-Habitat (2010) put this growth at 94% in developing regions.

Of world population figure, it is estimated that 54% live in urban areas or cities in 2014, and it is predicted to be 66% in 2050 (UN-DESA, 2014). Based on predicted urban population growth of 1.43 billion human being, including current slum population, number of persons in critical need of housing is roughly estimated at 2.25 billion. However, if average household size is assumed to be five persons, roughly 450 million housing units must be built worldwide to house the said population increase (UN-Habitat, 2010). Moreover, about 25% of global urban population are residing in slum areas. As at 2010, population of people living in developing nations slum areas was estimated 863 million as against 760 million and 650 million in 2000 and 1990 respectively. In Africa, approximately 61.7% urban population lives in slums or degrading housing (UN-Habitat, 2013c) with 56% slum urban residents in sub-Saharan Africa (UN, 2017) and cities/urban areas in modern-day West African characterized with poor housing, unhygienic water and sanitation, poor public health infrastructures (Owoeye and Omole, 2012).

This indicated that housing problems are global. And poor physical quality of human environment is revealed in urban areas and more pronounce in TUAs because of growing population and rapid urbanization. In Nigeria urban areas, housing problem is at an alarming state with around 75% urban residents living in degrading housing
conditions to human dignity and in slums (Olotuah and Bobadoye, 2011). Nigerian living in slum, TUAs inclusive, was estimated at 26.6 million in 1990, the figure had risen to 37.0 million by 2000, 42.8 million by 2005 and 47.6 million by 2009, then dropped to 42.1 million by 2014 (Pepple, 2012; UN-MDGs, 2014). The reduction might be concerted effort and huge investment made by the country through Millennium Development Goals (MDGs). These statistics are very alarming, reflection of inequality and requires investigation as well as concerted efforts. It is also consequential on the well-being of urban residents thereby unacceptable.

Moreover, it is important to note that above stated statistics are mostly in respect of housing situation in TUAs. whereas most of the researches on livable and sustainable housing often concentrated on housing estates in urban areas and housing development or provision. There is need for understanding of housing as mere accommodation because it has social-cultural and spiritual attachment to the housing residents. For example, many TUAs residents live in unsafe, substandard and poor housing that is security and safety prone as well as characterized with lack of basic facilities such as toilets, water, electricity and cooking facilities, and where such facilities exist, they are poor sewage and sanitary conditions, unhygienic water and cooking. Others live with many inconveniences and infrastructure overloads. This implies that housing problems in TUA include facilities and services, physical nature of the building, security and safety as shown in Figure 1.2.

![Figure 1.2: TUAs housing living conditions in Osun State, Nigeria](image-url)
In addition, residents do not move out of their present housing units. In Nigeria for instance, relocation and redevelopment are not affordable due to high cost and value, and distance to economic activities and place of work respectively. However, earlier measures usually undertaken by Governments, municipalities, CBOs (community based organizations), NGOs (non-governmental organizations) and international organizations such as urban renewal and slum upgrading programmes often focus on only urban environment and rarely considered housing units (Golubchikov and Badyina, 2012). There is need to focus on solving housing problem in the TUAs by improving the existing housing units to the need and expectation of the residents without necessarily demolishing houses. This is sacrosanct because livable space is a right to individuals probably being a place of: residence for many and work for majority be it urban areas or not, under-developed, developing and developed nations. However, housing or residential building is not sufficient to be livable but should be sustainable (Chazal, 2010).

Furthermore, existing researches are either on livability in relation to housing or sustainability in relation to housing. For instance, earlier studies conducted on livable housing focus on housing developed by government (Djebarni and Al-Abed, 2000; Iyanda and Mohit, 2015; Mohit and Iyanda, 2016, 2015; Raji et al., 2012; Raji et al, 2016), neighbourhood (Asiyanbola et al., 2012; Leby and Hashim, 2010; Yanmei, 2012), city/urban environment (Balsas, 2004; Betanzo, 2011; Buys et al., 2013; Chaudhury, 2005; Omuta, 1988; Pandey et al., 2014; Saitluanga, 2014). Also, previous studies on sustainable housing in urban area focus on government developed housing (Ibem et al., 2015; Ibem and Azuh, 2011; Nicholas and Patrick, 2015; Olotuah and Bobadoye, 2011; Tan, 2011), production/provision/development (Jiboye, 2011a, 2011b; Nicholas and Patrick, 2015; Van Wyk and Jimoh, 2015) and consumption (Ibem et al., 2015).

These studies were either on livable housing or sustainable housing with major focus on public planned housing estates in urban areas without recourse to TUAs. There was none of the previous studies that combined livable housing and sustainable housing nor having recourse to focus on TUAs. Also, none of the existing study develop an assessment index in assessing sustainable livable housing status especially
in the traditional urban areas. These are identified as gaps. At present, absence of SLH assessment index for TUAs has caused difficulties in determining housing that suits and meet the needs of the TUAs residents. This is critical in achieving target 11.1 of Goal 11 of the Global Goals or SDGs that involves ensuring access to safe, adequate and affordable housing linked with basic facilities and services as well as upgrade slums especially in TUAs. These identified gaps are vital in solving TUAs housing problems, improve residents’ living condition as well as meeting residents’ basic housing needs and preference without relocating them compulsorily or demolished their homes.

From the above, firstly, it could be deduced that researches on livability and sustainability are not integrated in relation to housing. This suggests a gap to bridge between livable housing and sustainable housing. There is need to integrate two concepts together in relation to housing. This is in response to the concepts’ integration calls, and argument that a housing unit or/and an area is not really and enough to be livable except it is sustainable over long period (Dorst, 2010; Newman, 1999; Van Kamp et al., 2003) and subsequent report that housing should be analyzed using two or more concepts (Lowe et al., 2013). Secondly, there is absence of SLH criteria or attributes explicitly highlighted toward achieving housing related target of the SDGs. Thirdly, focus of previous researches had always being on planned housing estates in urban areas without recourse to TUAs. Therefore, this research tends to bridge these gaps by integrating livability and sustainability concept in relation to housing with special focus on TUAs and conceptualizing SLH assessment index. Understanding, ensuring and developing SLH assessment index is very critical in assessing and solving housing problems of TUAs, especially in Nigeria and other developing nations.
1.4 Research Gap

Based on concluding remarks made on background of the study and statement of the problems discussed in Sections 1.2 and 1.3, the research gaps are as follows:

i. Livability and sustainability are not integrated in relation to housing. Thus, it is necessary to integrate them together in relation to housing.

ii. There is absence of SLH criteria or attributes explicitly highlighted toward achieving housing related target of the SDGs. Thus, it is essential in ensuring housing is livable and sustainable as well as achieving United Nation housing related target of the SDGs between 2015-2030.

iii. There is absence of assessment indices to assess housing in the TUAs in the developing countries. This is necessary toward improving existing housing based on TUAs residents need and expectations.

1.5 Research Questions

Towards bridging above identified gaps from the foregoing, this study seeks to provide answer to questions specified thus:

i. What are attributes and their indicators for assessing SLH in TUAs according to their importance?

The answer(s) to this question is needed to clearly identify SLH attributes and their indicators for TUAs to establish level of importance of the identified attributes and their indicators.

ii. What are significant relationships between these identified attributes and their indicators with SLH in the TUAs in order to establish therefrom SLH model?
Answer(s) to this question is required to examine causal relationship between identified attributes and their indicators with SLH so as to establish SLH measurement model, structural model and important performance matrix analysis (IPMA).

iii. What assessment index can be utilized to assess SLH in the TUAs toward improving housing living condition?

The answer(s) to this question is essential to evidently develop SLH assessment index toward improving residents’ housing living condition in the TUAs.

1.6 Research Aim and Objectives

The research main purpose is to provide SLH assessment indices for improving TUAs housing in Nigeria. Toward achieving the stated aim, the following objectives were set:

i. To determine attributes and their indicators for assessing SLH according to their importance for TUAs.

ii. To examine significance relationship between identified attributes and their indicators with SLH in order to establish measurement model, structural model and IPMA.

iii. To develop SLH assessment index toward improving housing living condition in the TUAs.
1.7 Research Hypotheses

The following are the hypotheses of this study:

H1 Housing unit attribute has significant relationship with sustainable livable housing in traditional urban areas.

H2 There is a significant relationship between the safety and security attribute and sustainable livable housing in traditional urban areas.

H3 Facilities and services attribute has significant relationship with sustainable livable housing in traditional urban areas.

H4 Community and neighbourhood attribute has significant relationship with sustainable livable housing in traditional urban areas.

H5 Economic development attribute has significant relationship with sustainable livable housing in traditional urban areas.

H6 There is a significant relationship between psychology impact attribute and sustainable livable housing in traditional urban areas.

H7 Resident well-being attribute has significant relationship with sustainable livable housing in traditional urban areas.

1.8 Research Scope

The research scope focuses on assessment of sustainable livable housing within the traditional urban areas with a view to exploring SLH attributes and their indicators for assessing TUA towards improving housing living condition. The research covers exploration of literature review related to housing, sustainability and livability, and identify SLH attributes and their indicators. The SLH attributes and their indicators identified were further explored using questionnaire survey instrument administered on residents of selected TUAs. These resident’s opinion on SLH attributes and their
indicators identified is the backbone of the research objectives achievement of this study.

In addition, the research scope is limited to Nigeria, a developing nation. Considering the geographical scope of the study, Osun State in the South-Western region of Nigeria had been chosen as main focus. Thus, the study focuses on three TUAs, one from each Senatorial Districts in Osun State. They are: Ile-Ife from Osun East, Iwo from Osun West and Osogbo from Osun Central senatorial districts. Moreover, the study sample was limited to residents of a housing units within the three TUAs. Therefore, the respondents of the study are the residents or household heads of housing units in the selected TUAs. As such, the resident or household head represents the sample unit while housing unit represents unit of assessment.

Furthermore, the SLH index assessment index developed in this study serves as an assessment tool for determining the degree to which sustainability in livable housing will impact on the residents towards improving their living conditions. The developed SLH index is specifically applicable to housing units already occupied in the TUAs towards improving residents’ housing living condition as well as meeting residents’ basic housing needs and preference without relocating them compulsorily or demolished their homes.

1.9 Significance of the Research

Regardless of the fact that living in housing meeting individual’s needs is a fundamental human right, Golubchikov and Badyina (2012) stated that safe and decent housing still remain a dream for many urban residents whereas many governments, particularly in developing countries, perceive housing as a social burden. Moreover, housing units provided by these governments do not meet the persisting need of their citizens. Literature revealed around 75% poor housing living condition of urban areas, which accommodate huge population, because of neglect, uncontrolled urbanization
and global industrialisation with its resultant effects found to be worrisome, disturbing and unacceptable.

An investigation of the SLH attributes and their indicators could have positive impact in improving housing living conditions in the developing nations, especially TUAs. These SLH attributes have remained none or less researched, thus significance and justification for this study as well as considered timely as entire world, through United Nation, has set 2030 as the target date to achieve its housing related target of its as Global Goals or SDGs. To this end, this research is significantly important not only to TUAs residents and government but to all housing stakeholders like; donor agencies, developers and researchers in the following ways:

i. The study enriches empirical studies on SLH, as it serves as feedback to local policy makers and governments namely, Local, States and Federal, on SLH assessment index and strong empirical data basis for SLH assessment. Thus, it helps government in formulating and implementing effective and appropriate residents’ oriented and enabling strategies and strategic policies in meeting current and future housing needs of her people.

ii. Having provides basic empirical evidences, the research would redirect industry-based and academics research interest on SLH attributes and indicators and subsequently SLH assessment. Thus, it serves as reference of future assessment index for further industry-based and academics researches.

iii. This study establishes rich hypothetical and empirical lessons and knowledge consciousness and transfer on SLH assessment within and among nations. Thus, TUAs, States and nations can learn from each other experiences on SLH assessment and benchmark for themselves.

iv. SLH assessment index developed showcase aspect of housing where improvement is required. Thus, it provides strategy that residents can be empowered with to improve their housing living conditions and a basis to
attract assistance, support and intervention from NGOs, donor agencies and philanthropies.

v. It fills in the gap that exist the literature, provide feedback on actual SLH status in the TUAs and helps private developers to realize prospect in alternative housing provision that meet needs of potential residents.

1.10 Research Methodology Overview

This Section entails methodology overview of the study such as: research procedures and planning, data collection methods, data analysis with its statistical tools, analysis and result reporting. It encompasses the methodology and procedure that was taken in accomplishing this research. Specifically, it interpolates objectives of the study which emanated from issues in problem statement and research question, data analysis tools’ methods and variables, and findings. The research methodology approach used was majorly quantitative survey-based approach for residents’ pilot and final questionnaire survey with partial a qualitative to enrich the research using FGD and subsequent questionnaire, that is quantitative approach, for expert validation. The most appropriate tool used in this study is face to face self-administered questionnaires with field assistants. Of importance, the method is efficient, in expensive and fast to be administered to a large population sample (Sekaran 2000; Zikmund, 2003). Five-point Likert Scaling questionnaire was developed ranging from 1 to 5. Pre-test study was conducted to certify that the questions are clearly understood and free from any unforeseen ambiguity among them.

The research population consisted of the residents, mostly head of household, within the purposively selected three TUAs namely Iwo, Ile-Ife and Osogbo in Osun State, South-Western Nigeria with a view to seeking their opinion regarding the SLH attributes and indicators as a potent strategy to improve housing living condition in the TUAs. Face to face self-administered questionnaires with field assistants was conducted through stratified random sampling from June 2016 to December 2016 in
each of the purposively selected three TUAs specifically Iwo, Ile-Ife and Osogbo in Osun State. Utilizing this procedure, 420 questionnaires were administered. The purpose was to establish empirical results and solutions to research questions, research objectives and test of hypotheses. Therefore, data collected based on resident responses were analysed utilizing descriptive analysis, SMART Partial Least Square Structural Equation Model (PLS-SEM) version 3.0 and Statistical Package for the Social Science (SPSS) version 22.0 as tools for analysis.

The research data analyses were conducted in two Phases. Phase one entails descriptive statistics in term of frequency distributions of background information and housing characteristics of the respondents using SPSS version 22.0. It also includes validation of the identified SLH attributes from literature using content validity index (CVI) and determination of relative importance of the SLH attributes for TUAs assessment using relative importance index (RII). Phase two entails SLH attributes and indicators preliminaries data analysis using SPSS and determination of SLH measurement model SLH structural model and SLH importance-performance matrix analysis using PLS-SEM version 3.0. It also includes development of SLH assessment index and therefrom validation of the assessment index developed using formulae.

Figure 1.3 shows research methodology overview for this study. Summarily, broad research methodological process, selection and justification utilized for this study were discussed in third Chapter of this thesis.
The research topic is re-worked with research objectives, research questions, research instrument and applicable tools for analysis to showcase the relationships and linkages that exist amongst them. This help to set limits of the research and ascertain the methods to be used in data collection and analysis (Corbin and Strauss, 2008). Table 1.1 revealed the relationship and linkages.
<table>
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<th>Research Objectives</th>
<th>Research Questions</th>
<th>Research Instrument</th>
<th>Analysis Tools</th>
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<tr>
<td><strong>One:</strong> SLH Assessment Model for TUAs</td>
<td>One: To determine attributes and their indicators for assessing SLH according to their importance for TUAs</td>
<td>One: What are attributes and their indicators for assessing SLH in TUAs according to their importance?</td>
<td>Questionnaire</td>
<td>* Content analysis</td>
</tr>
<tr>
<td></td>
<td>Two: To examine significance relationship between identified attributes and their indicators with SLH in order to establish measurement model, structural model and IPMA.</td>
<td>Two: What are significant relationship between these identified attributes and their indicators with SLH in the TUAs in order to establish therefrom SLH model?</td>
<td>Questionnaire</td>
<td>PLS-SEM to established SLH measurement and structural models, and IPMA</td>
</tr>
<tr>
<td></td>
<td>Three: To develop SLH assessment index toward improving housing living condition in the TUAs.</td>
<td>Three: What assessment index can be utilized to assess SLH in the TUAs toward improving housing living condition?</td>
<td>Questionnaire</td>
<td>Formulae: to evidently develop SLH assessment index and estimate therefrom assessed rating scores</td>
</tr>
</tbody>
</table>

### 1.11 Thesis Outline

As a matter of necessity, this thesis has been organized into eight Chapters. Chapter one is Introduction and it presents the fundamental elements of this study which includes; research background, rationale for the research, problem statement, and research aim and objectives based on the research questions outlined. In addition, research scope, significance of the study and research methodology overview. The ideas and information portray by each Section addressed the study in general. However, Chapter two concerns with literature review and conceptual framework and it presents a review of related literature on the key words in the research like housing, TUAs and its housing conditions, livability, sustainability, livable housing, sustainable housing, sustainable-livable linkages and SLH among others as they relate to the SLH attributes. Research gaps are established within the literature as relevant to the current research. Finally, the Chapter contains a review on building assessment systems,
building performance assessment and indexing and determined therefrom SLH attributes and indicators.

Then, Chapter three is research methodology and it discusses the methodology employed as to the choice of research philosophy and research strategy, such as logic of inquiry, to investigate research questions and justifications for these choices. A nested research methodology was presented to support the choice of the methodology used in this study. Consequently, ontological, epistemological and axiological research assumptions were explained in accordance with the research. An examination of the research tools and the rationale for the sampling and adopted questionnaire are justified accordingly. Also, proposed and conceptual SLH model as well as proposed SLH assessment indexing analysis and procedures were justified. Subsequently, this Chapter discusses respondents’ selection process, mode of data collection, and methods of analysis employed.

However, Chapter four entails preliminary study and it discusses the study area, specifically selected Osogbo, Iwo and Ile-Ife TUAs in Osun State of Nigeria. It also discussed outcome of focus group discussion (FGD) with panel and result of content validity, using content validity indexing (CVI), of SLH attributes and indicators from experts point of views. In addition, this Chapter discusses the outcome of pilot survey conducted with the respondents. Thus, this Chapter revealed that the research instrument is relevant and appropriate for the study. Chapter five is the phase one of data analysis focused on frequency distribution of respondents’ background, housing units’ characteristics and SLH attributes and indicators. It also discussed result of SLH attributes and indicators’ level of importance, using relative importance index (RII) from residents’ perspectives. This Chapter fulfilled the first objective of the study.

Chapter six discusses the second phase of data analysis and it is divided into four paths namely; SLH model hypothesis, SLH measurement model, SLH structural model, and SLH importance-performance matrix analysis. It also discusses the causal relationship between identified attributes and their indicators with SLH as well as path
coefficients values and outer weights of SLH attributes and indicators using SMART PLS-SEM version 3. Thus, the Chapter develops SLH model for TUAs and fulfills the second objective of the study. Chapter seven focuses on the process of developing the SLH assessment index for TUAs traditional urban areas using result from objective two in Chapter six. It also discusses the proposed scoring system and weighting for the developed SLH assessment index and validation therefrom of TUAs as a whole, on TUA basis and on a housing unit selection from each of the TUAs basis. As such, objective three of the study is fulfilled with SLH assessment index development and validation.

The final and eighth Chapter presents the conclusion of the research. It also discusses the research findings in respect of the research objectives and research questions of the study, accomplishment of the research objectives, contribution and implication of the research findings, limitation of research, provides agenda and recommendation for future research and conclusion.
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