UMMULKALTHUM WAMBAI MAHMOOD

ANALYSING THE LIVEABILITY OF URBAN HERITAGE FOR SUSTAINABLE URBAN GROWTH: THE HISTORICAL WALLED CITY OF KANO

MASTER THESIS

2025

NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF ARCHITECTURE

ANALYSING THE LIVABILITY OF URBAN AREA FOR SUSTAINABLE URBAN GROWTH: THE WALLED CITY OF KANO, NIGERIA

M.Sc. THESIS

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January 2025

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Declaration

I hereby declare that all information, documents, analysis, and results of this thesis have been collected and presented according to the academic rules and ethical guidelines of the Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Ummulkhaltum Wambai Mahmood

13/12/2024

Acknowledgments

All praises go to the Almighty Allah the Most Beneficent the Most Merciful whose life is in His hands and who has given me the ability to work on this thesis research successfully. My appreciation goes to my supervisor Assoc. Prof. Dr. Çilen Erçin, whose constant contribution, consideration, criticism, tolerance, and encouragement have made the successful completion of my thesis research. To the members of the academic and non-academic staff of the Department of Architecture, I thank you all for your help and contribution throughout the time of my academic work.

My gratitude goes to my father Maj. Gen. M.U Wambai, and my mother Mrs. Nana Abubakar. For their unwavering support, love, and concern accompanied by their encouragement and tireless prayers that have made the work a complete success. May the Almighty Allah reward your efforts. I especially want to acknowledge the enormous support of a friend, a partner, and most dear one Engr Aminu Musa, for his matchless support and assistance in every aspect. I appreciate all the words of affirmation. My family and friends back at home and here in school whose support and company have kept me going throughout my program, I thank you all.

Ummulkalthum Wambai Mahmood

Abstract

Analysing the Livability of Urban Area for Sustainable Urban Growth: The Walled City of Kano, Nigeria

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M.Sc., Department of Architecture

January 2025, (153) pages

This thesis study analyses the livability of urban areas for sustainable urban growth in the Walled City of Kano, one of the ancient towns in northern Nigeria. Most urban areas worldwide face complex challenges regarding livability and sustainable urban areas or important aspects of quality of life and well-being. Within this unique historical context, this study analysed the livability of the Walled City of Kano and proposed strategies for sustainable urban growth. The study aims to evaluate the current condition of the Walled City of Kano by analysing its social, economic, environmental, and cultural dimensions. Also, major factors influencing livability and sustainability will be identified by proposing strategies to achieve sustainable urban growth while enhancing livability and preserving its cultural identity.

The study adopted a mixed-method approach, combining the quantitative and qualitative approaches in analysing the livability parameters of the Walled City of Kano. Data collection included a literature review, site observation, and questionnaire survey to achieve general knowledge on multidimensional attributes of livability in urban areas and particularly the study case area. Findings from the analysis conducted revealed that livability within the Walled City of Kano is relatively poor; it is influenced by factors such as rapid population growth, inadequate infrastructure, socioeconomic challenges, safety and security issues, poor governance, environmental degradation, and lack of preserving the cultural identity. This study focused on the Walled City of Kano, which equally presented several challenges, increased by urban growth coupled with inadequate governmental regulations for sustainable urban growth. Therefore, this research study proposed strategies through which livability in the Walled City of Kano can be improved through inclusive urban design planning and design, good governance, and adopting practices that promote sustainable urban growth. Findings pointed out the necessity for maintaining the Cultural identity of the

Walled City of Kano along with taking care of the present urban challenges to enhance livability, quality of life, and sustainability in the Walled City of Kano. Recommendations are made on the development of economic activities, urban design, and planning considering the urban poor, increasing the number of green infrastructures, participatory governance, and community ownership and management. It also assists in clearer discussion on the aspect of livability in urban areas and sustainable growth by offering insight into the complications of ancient urban areas and suggesting solutions for the growth and sustainability of the urban area.

***Key Words**:* livability, urban area, sustainability, urban growth, walled city of Kano

Özet

Sürdürülebilir Kentsel Büyüme İçin Kentsel Alanın Yaşanabilirliğinin Analizi: Nijerya'nın Kano Surlu Şehri

Mahmood Wambai, Ummulkalthum
Yüksek Lisans, Mimarlık Bölümü
Ocak 2025, (153) sayfa.

Bu tez çalışması, Kuzey Nijerya'daki antik kentlerden biri olan Kano Surlu Şehri'nin bir vaka çalışmasıyla sürdürülebilir kentsel büyüme için kentsel alanların yaşanabilirliğini analiz eder. Dünyadaki çoğu kentsel alan, yaşanabilir ve sürdürülebilir kentsel alanlar veya kaliteli yaşam ve refahın önemli bir yönü açısından karmaşık testlerle karşı karşıyadır. Bu çalışma, Kano Surlu Şehri'nin yaşanabilirliğini analiz etmeye ve sürdürülebilir kentsel büyüme için stratejiler önermeye çalıştığı benzersiz tarihi bağlamdır. Çalışmanın amacı, Kano Surlu Şehri'nin sosyal, ekonomik, çevresel ve kültürel perspektiflerini analiz ederek mevcut durumunun değerlendirilmesini kapsar, ancak bununla sınırlı değildir. Ayrıca, yaşanabilirliği artırırken kültürel kimliğini koruyarak sürdürülebilir kentsel büyümeyi sağlayacak stratejiler önererek yaşanabilirliği ve sürdürülebilirliği etkileyen başlıca faktörler belirlenecektir.

Bu çalışmada, Kano Surlu Şehri'nin yaşanabilirlik parametrelerini analiz etmede nicel ve nitel yaklaşım yöntemlerini birleştiren karma yöntem yaklaşımı benimsenmiştir. Veri toplama, kentsel alanlarda ve vaka çalışması alanında yaşanabilirliğin çok boyutlu yönleri hakkında genel bilgi edinmek için literatür taraması, saha gözlemi ve anket araştırması içerir. Yapılan çalışmadan elde edilen bulgular, Kano Surlu Şehri'ndeki yaşanabilirliğin zayıf olduğunu; hızlı nüfus artışı, yetersiz altyapı, sosyoekonomik zorluklar, güvenlik ve emniyet sorunları, kötü yönetişim, çevresel bozulma ve kültürel kimliğin korunamaması gibi güçlerden etkilendiğini ortaya koymaktadır. Bu çalışma, sürdürülebilir kentsel büyümeyi gerçekleştirmeyi amaçlayan yetersiz hükümet düzenlemeleriyle birlikte kentsel büyümeyle artan bir dizi zorluk sunan Kano Surlu Şehri'ne odaklanmaktadır. Bu nedenle, bu araştırma çalışması, kapsayıcı kentsel tasarım planlaması ve tasarımı, iyi

yönetişim ve sürdürülebilir kentsel büyümeyi teşvik eden uygulamaları benimseme yoluyla Kano Surlu Şehri'ndeki yaşanabilirliğin iyileştirilebileceği stratejiler önermektedir. Bulgular, Kano Surlu Şehri'nin kültürel kimliğinin korunmasının yanı sıra Kano Surlu Şehri'nin yaşanabilirliğini ve sürdürülebilirliğini iyileştirmek için mevcut kentsel zorluklarla ilgilenmenin gerekliliğine işaret etmektedir. Ekonomik faaliyetlerin geliştirilmesi, kentsel tasarım ve kentsel yoksulları dikkate alan planlama, yeşil altyapıların sayısının artırılması, katılımcı yönetim ve topluluk mülkiyeti ve yönetimi konusunda yapılan öneriler. Ayrıca, eski kentsel alanların karmaşıklıklarına ilişkin içgörü sunarak ve kentsel alanın büyümesi ve sürdürülebilirliği için çözümler önererek kentsel alanlarda yaşanabilirlik ve sürdürülebilir büyüme yönü hakkında daha net tartışmalara yardımcı olur.

Keywords: yaşanabilirlik, kentsel alan, sürdürülebilirlik, kentsel büyüme, Kano surlu şehri

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List of Abbreviations

AD:	Anno Domino
EIUs:	Economist Intelligence Units
EU:	European Union
FUA:	Functional Urban Area
GDP:	Gross Domestic Products
LGA:	Local Government Area
ODPM:	Office of the Deputy Prime Minister
OECD:	Organization for Economic Co-operation and Development
QNDF	Qatar Natural Development Framework
SDGs:	Sustainable Development Goals
SPSS:	Statistical Package for Social Sciences
SUG:	Sustainable Urban Growth
TOD:	Transit-Oriented Development
UN:	United Nations
WCED:	World Commission on Environment and Development

CHAPTER I
Introduction

This chapter gives a general explanation of the thesis through a statement of the problem, purpose of the study, research questions and hypothesis, significance of the study, limitations, and the definition of terms.

In many parts of the world, a considerable number of the global population resides in urban areas, which has created a significant rise in urban population (Dadashpoor et al., 2019). Poor environmental quality, noise, and air pollution are all the challenges faced in an urban area. Previous analyses from urban researchers and human communities emphasized the concept of livability as one of the approaches to achieving a viable environment. Their target is to improve the quality of urban areas on a human scale in urban cities. Since then, a widespread wave of settlement and its problems have increased the importance of livability and made it difficult and impossible to overcome. Livability is a term used to describe an area that enhances the social, physical, and mental being of its residents. The concept of urban livability takes into consideration all aspects that impact the quality of life, such as physical, environmental, social, and economic factors. The goal is to achieve cities that are functional and also enhance individuals' well-being as discussed by (Adhikari & Roy, 2021).

Nonetheless, Sustainable urban growth is said to be the process of creating livable and environmentally friendly urban areas while addressing economic, environmental, and social challenges to achieve harmony between the community needs and the natural environment (Abdul Hannan Qureshi et al., 2023). Also, Sustainable urban growth involves the need for cities to grow in a manner that ensures limited negative environmental impacts, social equity, and economic stability. Emphasis is on the use of policies that could control population growth in urban areas while at the same time allowing natural resources to be preserved, carbon emissions to be reduced, and inclusive development to be pursued. The response to sustainable urban growth acknowledges the balance between current human needs for cities and those that will be needed for future generations in long-term sustainability (Pathways to Sustainable Cities, 2020). According to the study of Al-Thani et al. in 2019, sustainable urban growth is based on the analysis and

implementation of policies that will improve the livability and sustainability of urban areas either at global or regional levels.

Moreover, Urban livability and sustainable urban growth are of great significance to architecture, environmental design, and urban development professions to improve the quality of life for urban residents while also preserving future generation needs from the potential consequences of urban growth. However, over the past few years, global urbanization has experienced drastic growth by over 55% of the global population residing in cities. The United Nations predicted a 65% increase in sustainable urban growth by 2050, potentially leading to socio-economic growth and standard of living (Paul & Sen, 2020).

In Nigeria, rapid urbanization has deconstructed the functionality of living in urban areas. Because of this, the urban population has increased by a great margin, with forecasts estimating that there will be an increase of 226 million urban residents in 2050. This speed and substantial rate of migration, without adequate policies laid down with which to manage this growth and development, caused several problems related to housing, infrastructure, and sustainability (Edward et al., 2017).

The walled city of Kano, located in northern Nigeria, is a momentous urban area that has played a substantial role in the region's cultural, commercial, and administrative life. Kano's historical origin started in the 9th century A.D. around Dala Hill, Kano's development began with the construction of the first city walls between 1095 and 1134, which was finished around 1150. These walls not only serve as a defensive structure but also symbolize the unity and identity of the city, which comprises key landmarks such as the central mosque, the Kasuwan Kurmi market as the commercial hub, and the Emirs palace (Dankani, 2016).

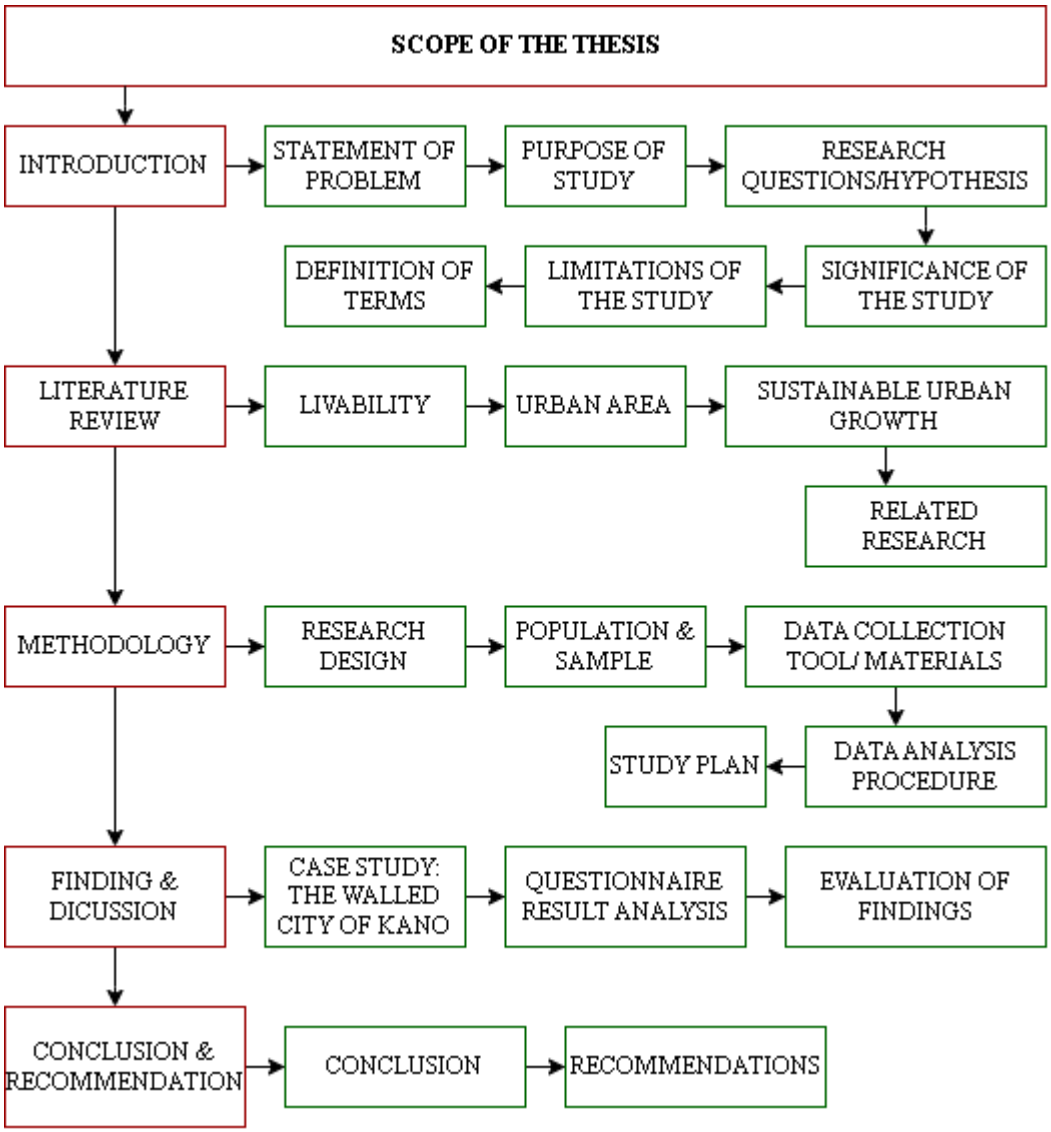
Also, cultural identity and traditional markets are other unique case studies for the Kano City Walls because of their historical importance and challenges faced by the city in sustaining its environment and cultural identity amidst rapid urban demand. However, the walled city of Kano faces several issues related to rapid population growth, poor infrastructure, socioeconomic inequality, environmental degradation, and urban sprawl, much like many other cities in the Global South. These challenges raise questions about the sustainability and livability of the walled city's urban growth. Livability encompasses numerous factors that influence livability in urban areas, including access to amenities, public spaces, housing, transportation, and environmental quality. While such context is presented, this study

intends to analyse the elements that have so far hindered or are going to help the livability of the Walled City of Kano and advance ways for urban growth that could be evident. This research tries to determine what the real situation looks like in urban settings with challenges and proposes some helpful interventions that will facilitate the qualitative and inclusive improvements of life within such a very historic urban environment.

However, this study is designed into six different chapters which include the Introduction Chapter which gives general knowledge about the study, the Literature Review Chapter is analyses earlier studies related to the research, the Methodology Chapter, and Findings Chapter, Discussion Chapter, then the Conclusion and Recommendations Chapter gives the information obtained from the research study. (Figure 1) shows the scope of the thesis.

Figure 1

Scope of the Thesis



(U. W. Mahmood, 2024)

Statement of the Problem

Most urban areas across the globe face complex challenges regarding livability and sustainability. It has become very fundamental that environmental impact, carbon emission, and quality of life are considered as cities grow or expand. The Walled City of Kano is an interesting case study due to its historically unique urban fabric. In the Walled City of Kano, the urban environment clearly outlines a contrast between preservation and livability on one hand and addressing modern city challenges on the other. The Walled City of Kano faces problems of all types which include overcrowding, infrastructural degradation, inadequate public service delivery

to socio-economic inequalities. The issues experienced within the area impact negatively on its livability, and in fact, long-term sustainability growth is questioned. In the Walled City of Kano, several issues exist that influence the revitalization process in the urban landscape, which include narrow pathways, closed structures, and disrepair of structures. Resistance of the community to urban growth is another main challenge that the residents perceive as a threat to the comfort condition of their homes. Apart from that, the deficit in access to affordable housing and social bonding is contributing to economic disparity and degrading living (Auwalu Faisal Koko et al., 2023). The study by Dankani in 2016, stated that the walled city of Kano faces problems related to livability and sustainable growth of the urban area, which are summarized as follows:

- The Walled City faces deterioration of infrastructure over the years due to inadequate funding and negligence.
- The Walled City is highly populated, extremely high population density causes overcrowding and pressure on resources.
- Narrow streets and pathways within the Walled City are seriously hindering the movement of vehicles thereby causing congestion.
- Education, healthcare, and socially equitable access to services to all its residents remains an uphill task in certain aspects in which some areas within the Walled City are unserved.
- The Walled City of Kano has an environmental impact that needs more attention, such as waste management, green spaces, and water supply.

Purpose of the Study

This research seeks to analyse the livability of the Walled City of Kano and propose strategies for achieving sustainable urban growth, taking into consideration its unique historical context. The research aims to achieve the listed objectives:

- To evaluate the current state of livability in the Walled City. This includes analysing factors such as housing quality, public spaces, social interactions, safety, and community well-being.
- To identify key factors influencing urban livability and sustainable urban growth.

- To propose sustainable urban growth strategies for enhancing livability while preserving the cultural identity of the Walled City of Kano.

Research Questions/ Hypothesis

The following research questions will guide in analysing the livability of the Walled City of Kano for sustainable urban growth.

1. What are the livability problems that exist in Kano's Walled City?
2. What is the effect of population density on the physical environment and public places/buildings in the walled city?
3. Are the government and stakeholders of the Walled City in support of adopting sustainable urban growth practices?
4. What sustainable urban growth strategies can be proposed to improve the livability of the Walled City of Kano?

Based on the research questions outlined above, the following hypotheses are being proposed. The study's hypothesis states that:

1. The livability and quality of life of the Walled City of Kano can be improved by addressing the community's needs through the implementation of urban design projects.
2. Sustainable urban growth practices can be improved by involving the government and stakeholders in attending awareness and training programs.

However, the proposed research question and hypotheses aim to explore the multifaceted nature of livability within the context of the Walled City of Kano. By analysing and identifying the factors that contribute to livability, this research seeks to provide actionable insights for architects, urban planners, and policymakers.

Significance of the Study

For this purpose, the thesis research seeks to contribute to the current knowledge of how livability in the Walled City of Kano can best be understood and improved amidst the rapid growth of its population, environmental degradation, and increasing social inequality. The study will further widen the scope of urban studies by looking at the interplay between livability and sustainable urban growth and provide actionable recommendations for government officials, urban planners, and community stakeholders. The finding will also set a framework for sustainable urban growth, and economic, environmental, social, and cultural dimensions. This

comprehensive approach will be useful for researchers, practitioners, and policymakers in their quest to foster sustainable urban growth in diverse contexts. The study will also emphasize the need for preserving the ancient and architectural culture of the city, along with promoting its sustainable development. The findings have a bearing on wider discussions concerning the building of resilient urban environments that focus on livability and well-being in cities worldwide facing exceptional challenges linked to climate change, migration, and urbanization. This is particularly important in Kano, and it enables a deeper understanding of living in the cities, especially in the global south. Also, the study will provide a foundation for further research and policy implementation.

Limitations

The research thesis will analyse the Walled City of Kano with a focus on the livability of the urban area for sustainable urban growth. Several limitations have to be considered, including issues related to data availability and reliability, time limitations, subjectivity in livability analyses, limitations in methodology, and external influences. Due to the study's historical, cultural, and socio-economic features, its findings cannot be directly used in other urban environments. The research will use quantitative and qualitative data; however, data availability and reliability are also some challenges, and subjectivity on livability assessment might alter data interpretation. The research time may limit data collection from long-term livability changes.

Furthermore, external factors, such as national policies or economic crises that significantly impact the local context, may not be adequately addressed in this study. The study, despite several limitations in various aspects, provides valuable information or knowledge on the livability of the Walled City of Kano for sustainable urban growth. The limitations serve as a foundation for transparency and a basis for future research.

Definition of Terms.

The meaning of several important terminologies and keywords related to the study’s focus on livability in urban areas for sustainable urban growth in the Walled City of Kano. These definitions will ensure a common comprehension of the study and also for better understanding.

Livability

Livability usually refers to issues associated with the long-term well-being and experiences of people and their environment or neighbourhood. The idea includes elements such as neighbourhood amenities, parks, open spaces, walkways, grocery shops, and restaurants as well as considerations of the quality of the environment, safety, and health. It also includes factors like affordability and accessibility. Livability is subjective, as individuals show diverse needs regarding their residential and environmental preferences.

Urban Area

An urban area is an area that is characterized by a large number of population density and a developed infrastructure. The areas that surround a city are defined by jobs that are not agricultural, and the abundance of structures developed and built by humans, which includes residential, and commercial establishments, bridges, roads, and railways.

Sustainable Urban Growth

Sustainable urban growth involves the design, planning, and development of cities that emphasize long-term resilience, human advancement, and resource efficiency while reducing the negative environmental effects. Sustainable urban growth involves the creation of cities that fulfil the requirements and demands of the present and future generations while safeguarding the social, economic, and environmental sustainability of the city. The emphasis is on a balance between growth and development while safeguarding the well-being of an environment, thereby ensuring that urban areas are resilient, inclusive, and livable (Sustainable Urban Development- (Population and Society)- Vocab, Definition, Explanations| Fiveable, 2024).

The Walled City of Kano

The Historical Walled City of Kano, known as *Ganuwa* in Hausa are defensive structures designed to safeguard the residents of the historical city of Kano. The defensive walls were constructed between 1095 and 1134, which was completed in the mid-14th century. The Walled City of Kano is regarded as the most significant monument in the western part of Africa.

CHAPTER II
Literature Review

This chapter reviews the theoretical framework of livability, urban area, and sustainable urban growth, using information provided in figures and tables. This chapter also examines related studies to provide insights into the subject matter of the study.

Theoretical Framework

This research study explored the theories related to the study, as well as identifying and pinpointing limitations in the current literature reviewed on livability in urban areas and urban growth sustainability.

Livability

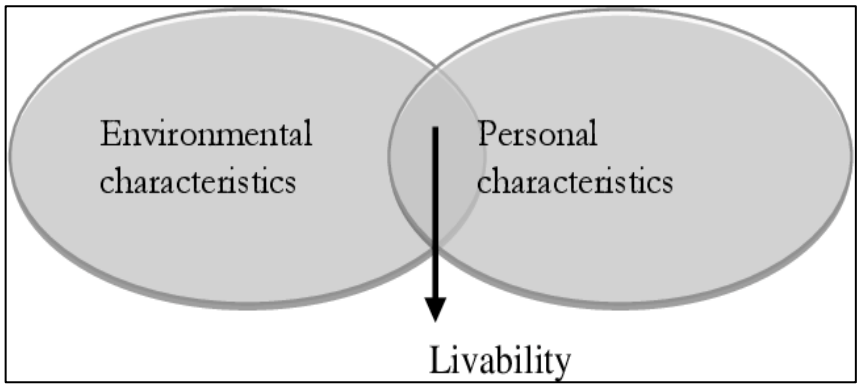
The term "livability" is frequently used ambiguously in academic research, the increasing interest as well as involvement of professionals and scholars in livability issues necessitates a comprehensive knowledge of livability, especially within the context of urban environments in academic discipline (Kashef, 2016). Similarly, livability is a subjective concept used differently by different individuals and groups of professionals based on the context of their study. Regardless of its importance, there is no consensus on its definition. Therefore, livability is an important aspect of the quality of life, as it strives to improve the quality of human well-being. The key factors include way of life, socio-economic status, and daily activities. Thus, a need for a specific and contextual definition of livability is required (Almashhour and Samara, 2022). Livability is an area suitable for human settlement and ultimately the overall well-being and or quality of life of its people (Mushtaha et al., 2020).

Additionally, In UK English it is spelled "Liveability" while "Livability" is used in US English. In the US it states that livability describes the well-being and quality of life whereas in the UK, it is attributed to cleanliness, availability of plants, and safety in the surrounding environment. Nonetheless, both definitions include terms like satisfaction, well-being, and happiness, making it difficult to define livability in a certain context. Livability comprises the physical features of a location and its living conditions, alongside the opinion of an individual concerning its

suitability for dwellings. As shown in (Figure 2) the behaviour-related concept is influenced by environmental and personal characteristics, requiring identifying subjective experiences to understand key features and assess their effectiveness (Ahmed et al., 2019).

Figure 2

Behaviour-Related Function of Livability



(Ahmed et al., 2019)

More so, it is said that livability refers to the standard of living of life that individuals experience in an area that is influenced by the natural environment. It includes aspects such as quality of life, life satisfaction, and well-being. These phrases are interrelated and reflect individuals' perceptions of their surrounding environment (Maysa & Hamid, 2020). Livability defines the way of life, overall quality of life, and health of people within a city, comprising physical, social, and mental health, alongside attractive urban space that offers cultural diversity (Adhikari & Roy, 2021). Also, livability relates to the general standard of living within a specific location, including attributes such as public amenities, safety, affordability, environmental conditions, and sociability. It also takes into consideration public transportation, schools, healthcare facilities, and the social and cultural environment. Academics in urban planning have adopted livability concepts. Nonetheless, a globally agreed definition remains elusive due to the varied methodologies of different scholars. Livability is hard to define because of its diverse aspects and the variation among major cities (Medayese et al., 2021).

In conclusion, livability concerning human existence as well as the environmental quality of life are important in achieving person-environment

compatibility. Livability can be defined as a location-based perception that describes the factors within a residence, community, or neighbourhood that improve the overall standard of living and wellness of those who live there. The City Plus Index broadens this definition to an urban context, defining livability as an urban area comprising satisfying or comforting spaces that enhance the physical, mental, and social well-being and personal development of its habitats. Efforts to create human societies in an environment that is safe, secure, and healthy are defined as the livability of urbanization and the decrease in quality of life that results from it. This phrase has broadened to include issues like safety, availability of service, walkability, accessibility, transit, comfort, and participation, which enhances the concept of livability (Maysa & Hamid, 2020).

Concept and Principles of Livability

For a long time, academics have been interested in the idea of livability, which has provided insights into diverse perspectives from different periods. The first Babylonian Empire, under Hammurabi's leadership, introduced a legal framework known as "Hammurabi's Code", designed to achieve economic and social equality. In the 4th century BCE, Aristotle emphasized the significance of living a good life for achieving satisfaction and individual well-being. The philosophical school of Stoicism emphasized the individual's understanding of the good life. The publication of British urban planner Sir Ebenezer Howard titled "Garden Cities of Tomorrow" advocated for the formation of neighbourhoods or cities for easy access to nature. After World War II, programs like the Livability Plan and Habitat in Vancouver were introduced to enhance urban livability. From 1960 to 1990, architects, urban planners, and academics encouraged the use of livability principles. Jane Jacobs, Jan Gehl, and Donald Appleyard significantly influenced the development of livability. Urban authorities and housing organizations in the year 1990s adopted the term 'livability' to shape and invite socioeconomic demographics of urban areas. The concept surged in popularity in the twenty-first century due to annual surveys ranking the most livable cities in the world (Maysa & Hamid, 2020).

Similarly, livability is a concept that is connected to individual quality of life and well-being, a complicated concept that is gaining popularity globally. One of the main concerns of the global problems of livability in urban areas includes individual well-being, neighbourhood facilities, and amenities, and also environmental quality.

The study addresses multiple components of urban life, including safety, accessibility, walkability, comfort, services, inclusivity, equality, and transit. As urban areas become increasingly populated livability in urban areas serves as a measurable component of quality of life that draws the global resources (Maysa & Hamid, 2020). The emphasis on creating a vibrant and livable urban environment has become a fundamental challenge globally, especially to the 17 UN Sustainable Development Goals (SDGs) (Kovacs-Györi et al., 2020) as shown in (Figure 3).

Figure 3

The 17 Sustainable Development Goals 2030

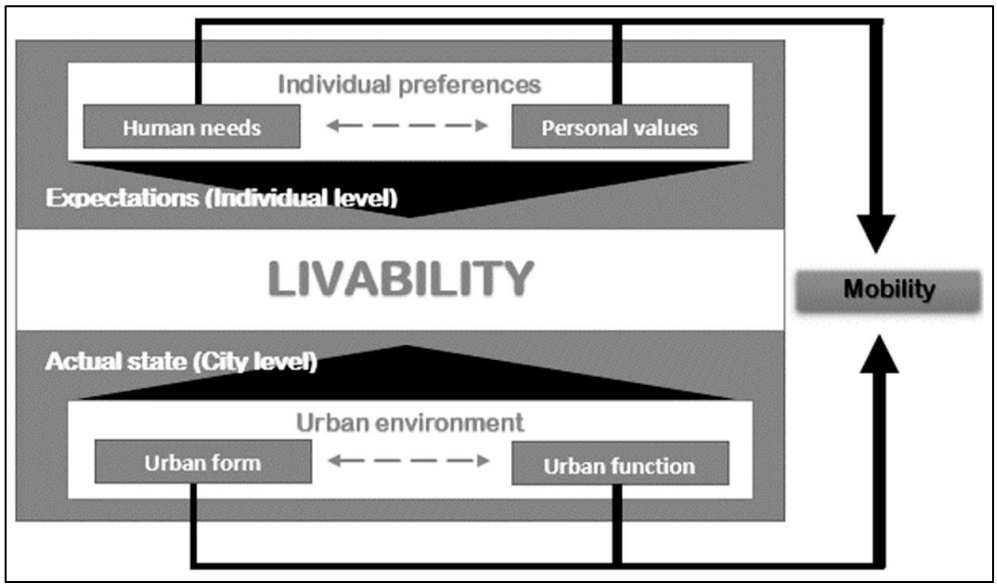
(Admsusint, 2023)

Urban livability refers to the quality of these elements as perceived by a person based on the duration of stay, place attachment, and social connection. Human needs and personal values identify the objectives and skills of individuals giving rise to complex issues in livability measurement. However, this method can represent key features of urban living from the perspective of different social groups or individuals. Mobility is the central aspect of livability, and surfaces of these relate to all matters of livability. It may come in the form of easy access to functions in town, as functionality cannot counterbalance weaknesses relative to mobility and

accessibility. The use of mobility as an indicative or proxy variable in livability assessment is more than the contribution it makes among many factors responsible for livability; mobility underlines the relevance of spatiotemporal aspects in assessing quality of life (Kovacs-Györi et al., 2019) as shown in (Figure 4).

Figure 4

Key Elements of Livability



(Kovacs-Györi et al., 2019)

The perception of urban livability includes the evaluation of the standard of living within cities, focusing on the inclusion of social, environmental, cultural, and economic factors. Utilizing local and traditional housing techniques to improve livability by incorporating designs that are conscious of the environment, community involvement, and the implementation of efficient resources for building practices is of great significance as discussed by (Afzal et al., 2024).

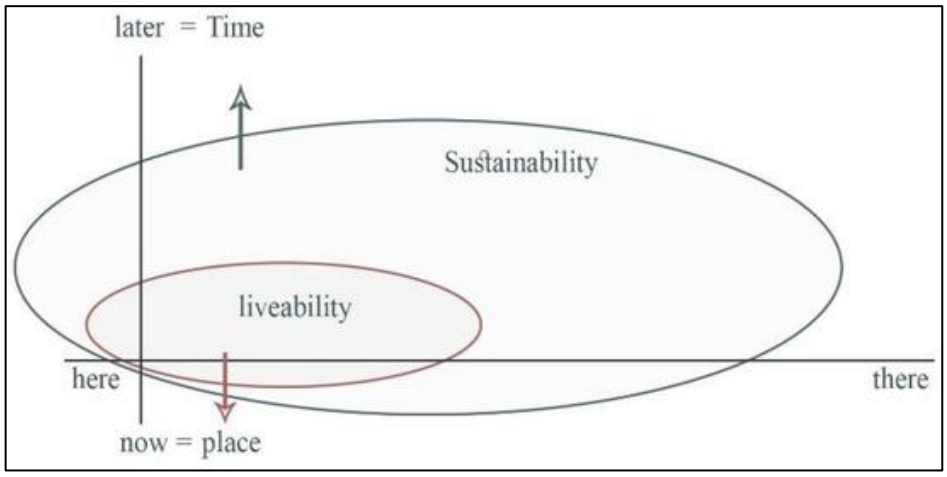
The distinctive emphasis on the relationship and connections of public and private space about the concept of urban livability is connected to the environment and the influence of cultural values. Developed countries have achieved a greater standard of livability by enhancing economic and health conditions, along with showcasing environmental awareness. Nonetheless, emerging countries continue to face challenges like hunger, poverty, and disease mitigation. Enhancing livability requires urban areas to reduce their environmental impact while prioritizing the social and psychological dimensions of human existence (Kashef, 2016). Urban

livability should consider urban morphology as a catalyst for social and economic activities, aligning economic and physical development choices to foster environments that are socially and culturally attuned. Urban areas need to establish governance frameworks that foster participatory democracy while also formulating comprehensive indicators that assess both the tangible elements of livability and the subjective experiences of residents regarding their cities (Kashef, 2016).

Besides, in design, planning, and engineering, livability is one of the most relevant concepts connected with sustainability. Sometimes, it is said that people have a right to both sustainability and a community that is livable. That makes planners and decision-makers address the needs concerning today and future people. However, the theoretical connection between livability and sustainability is not well comprehended, leading to a lack of agreement on policies and their evaluation. The WCED described sustainable growth as the satisfaction that meets the present needs without compromising the needs and abilities of forthcoming generations. Livability on the other hand emphasizes the present and immediate surroundings. Focusing on immediate circumstances and integration of sustainability practices for the present and coming generation. In comparison with sustainability, which is perceived as inanimate, livability is a more fluid concept as values and context provided by the community keep on changing. This, in return, makes it slightly more achievable. Knowing how livability complements sustainability might allow policymakers to bridge present needs with future needs linked to sustainability (Almashhour & Samara, 2022). (Figure 5) shows the relationship between the livability concept and sustainability.

Figure 5

Relationship between Livability Concepts and Sustainability

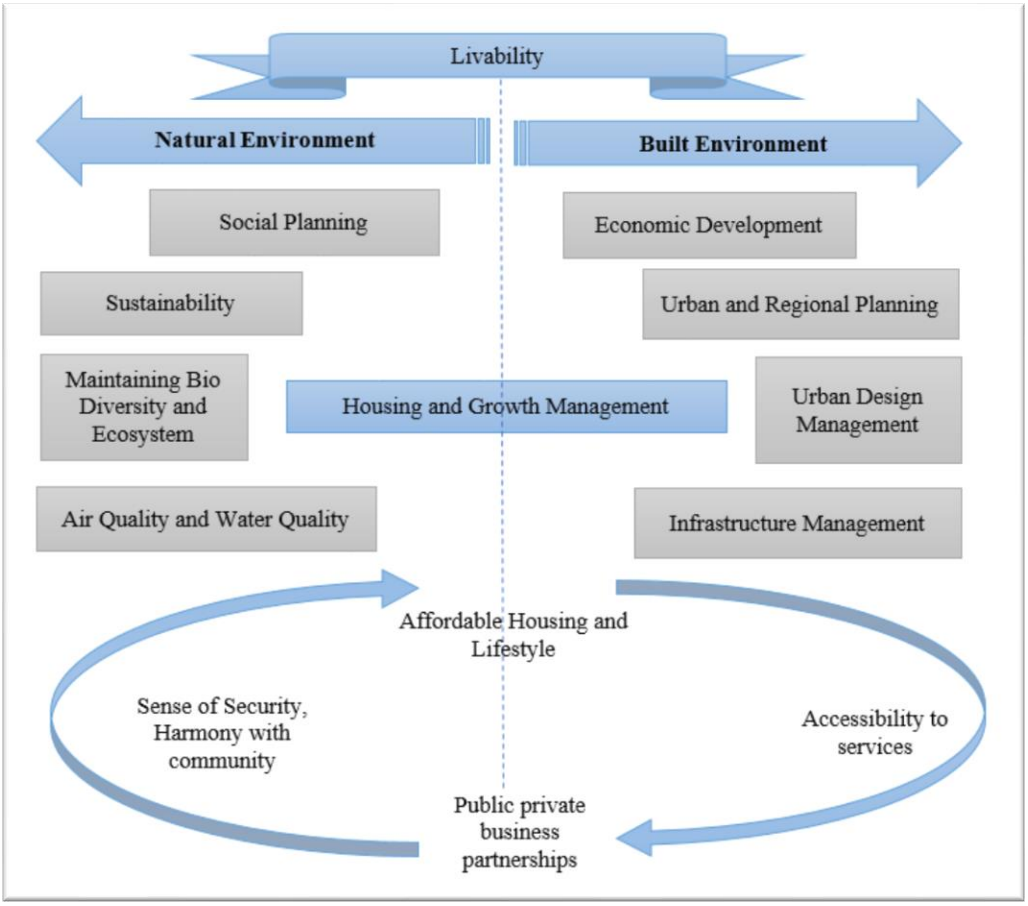


(Almashhour & Samara, 2022)

Particularly, livability is said to be developed through sustainability, urbanization, and resilience, which is a concept that focuses on the balance and favourability of living conditions within a geographical area. It is a key component in urbanization, which is said to address urban growth and the long-term sustainability of towns. Centralized communities are cities with a high population density. However, sustainability concepts also consider economic, social, and environmental aspects. While commercial indexes have not emphasized the importance of environmental indicators, policymaking, planning, and political authorities have a responsibility to ensure the balance of residents by defining livability based on social, economic, and environmental factors (Tennakoon & Kulantunga, 2019) as shown in (Figure 6).

Figure 6

Explanation of the Concept of Livability



(Tennakoon & Kulantunga, 2019).

In summary, Livability is a concept whose meaning varies based on measuring criteria and viewpoints, it is adopted in various research studies covering several fields such as geography, urban planning, ecology, and sociology, as a result of the lack of uniformity in the literature regarding the dimensions to consider capturing the concepts. Despite this, livability deals with an individual's opinion on their environment, comprising a subjective analysis of living conditions. It includes attributes of urban areas that render them suitable for living, which includes physical attributes such as public amenities and theoretical factors like the sense of place, cultural identity, and social connections. Cultural diversity is also required for enhancing livability in urban development (Hashim & Leby, 2010).

Factors Influencing Urban Livability

Urban livability is influenced by several connected influences. The following discussions are essential classifications along with instances of these influencing factors, which are being validated by relevant studies. Influencing factors are categorized into four distinct factors which include social, economic, environmental, and physical factors or dimensions. Comprehending these dimensions is essential for policymakers, urban planners, and urban designers seeking to improve the standard of living in urban environments. Environmental quality significantly influences urban livability which serves as a fundamental factor under the environmental aspects. Various research emphasizes the importance of the built environment in shaping livability in urban areas, suggesting that urban designs and planning must consider both human and physical factors to promote a livable environment (Pan et al., 2021). Urban environment and livability are distinctive studies that show access to green spaces associated with better mental health and well-being of individuals, resulting in enhancing overall livability. Also, environmental factors in cities like atmosphere quality and sound pollution directly affect the satisfaction level and well-being of its individuals. Economic stability and social and environmental improvement are also an essential factor affecting the environmental livability of an urban area or city (Zhang & Qian, 2024).

Correspondingly, the economic factor is also a significant aspect, as financial security is often considered as a crucial basis for human financial security and holds a fundamental aspect of livable cities and communities' growth and development. Some scholars argue that while economic factors are important, they should not overshadow the human-centered aspects of livability that focus on the needs and people's well-being (Wang & Miao, 2022). That is to say, the affordability of goods and services significantly influences the livability of urban areas. The study of Kovacs-Gyori and Cabrera-Barona in 2019 highlighted that urban functions and socioeconomic status are important determinants of individuals' perceptions of livability. Integrating economic growth with considerations of environmental and social sustainability aspects is important for achieving urban livability.

Also, social factors are another key factor. Unity or connection between individuals in a community or society can never be overemphasized when it comes to enhancing an urban environment to be vibrant and safe for its residents as it enhances a feeling of safety and belonging. Population growth can cause

environmental deterioration in cities which influences livability, suggesting the need for sustainable practices that enhance a sense of social well-being (Deep, 2023). The social interactions within communities significantly influence livability in urban areas, the study suggests that enhancing community engagement can improve the level of satisfaction of the residents with their environment or neighbourhood (Lee & Jeong, 2020). Based on the study, the relationships, and connections among members of a community are essential for enhancing the livability and standard of living of its members thereby encouraging involvement in community activities to improve individuals' sense of identity.

Finally, is the physical or infrastructural factor, The effectiveness of city public transportation networks and facilities is significant in improving livability. Designing urban regions that prioritize the needs of their inhabitants, ensuring that residents can enjoy a good standard of living and find satisfaction in both their working and living environment is significant. (Tsuang & Peng, 2018). However, the study of (Saeed et al., 2022) stated that well-designed public transportation systems can significantly enhance accessibility and decrease dependence on private cars, contributing to a more livable urban environment. Developing thorough indices for assessing urban livability can help pinpoint critical areas for enhancement in urban planning, offering that cities address the varied needs of their residents.

In a nutshell, urban livability is determined by numerous interconnected factors across environmental, economic, social, and infrastructural dimensions. An integrated approach that encompasses these factors is significant for developing viable and comfortable cities. Urban planners and policymakers must highlight these factors in enhancing the standard of living for urban dwellers.

Dimensions and Indicators of Urban Livability

The research on 'livability' highlights various dimensions that need to be studied to understand the concept of the multidisciplinary background. The study (Leby & Hashim, 2010) described four dimensions of livability namely physical, social, functional, and safety. The physical dimension is related to the neighbourhood's natural environment, comprising green spaces and parks. The social dimension emphasizes community aspects and relationships, encompassing neighbourhood ethical conduct, a sense of place, and community life. The functional dimension focuses on the availability and accessibility of services and amenities, like

educational institutes, healthcare, job opportunities, and commercial spaces. The safety dimension emphasizes individual protection from accidents and crimes, which are assessed through indicators such as the presence of police, fire services, and the availability of security personnel. However, residents regard safety as the most fundamental dimension. (Figure 7) shows the different livability dimensions defined in different studies.

Figure 7

Livability Dimensions Defined in Selected Studies

Omuta (1988)	Holt-Jensen (2001)	Visser et al (2005)	Heylen (2006)	ODPM (2006)
Employment Housing Amenity Educational Nuisance Socio-economic	Aesthetics of living environment Personal Social relations Functional	Housing Social environ-ment Physical environment Functional	Dwelling Social environ-ment Physical environ-ment Safety	Environ-ment quality Physical environ-ment Functional environ-ment Safety

Note: ODPM is "Office of the Deputy Prime Minister"
Source: Office of the Deputy Prime Minister, (2006)

(Leby & Hashim, 2010)

The four main dimensions of livability are social physical, functional, and safety. The study finds sixteen (16) livability indicators. These indicators help in analysing the livability of a neighbourhood. Functional dimensions include quality healthcare, educational facilities, and other functional facilities. Social dimensions include community engagement, social support, emotional attachment to the environment, and a sense of belonging. Physical dimensions include neighbourhood maintenance, design features, and surveillance opportunities. Safety, which is a significant dimension, includes personal safety from accidents and crime (Leby & Hashim, 2010). (Figure 8) shows the summary of livability indicators and dimensions.

Figure 8

Summary of Dimensions and indicators of livability

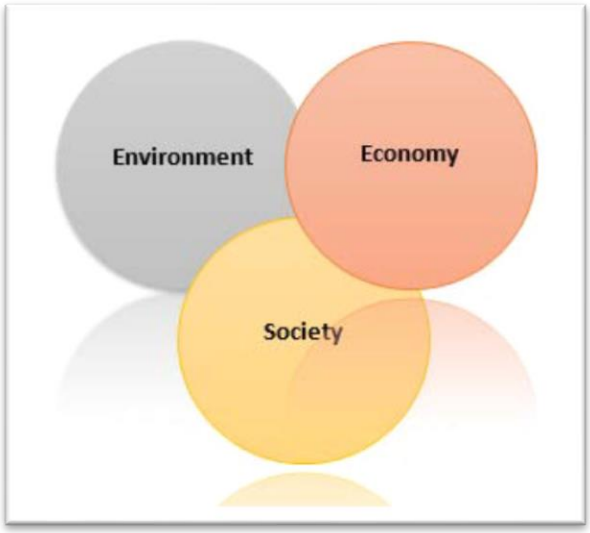
Liveability dimension	Theme
Social dimension (social relations)	behaviour of neighbours (nuisance)
	community life and social contact
	sense of place
Physical dimension (residential environment)	environment quality
	open spaces
	maintenance of built environment
Functional dimension (facilities and services)	availability and proximity of amenities
	accessibility
	employment opportunities
Safety dimension (crime and sense of safety)	number of crime
	number of accidents
	feeling of safety

(Leby & Hashim, 2010)

Preferably, livability dimensions differ or are connected with multiple aspects of life, also, these dimensions will be determined by place, culture, and circumstance. In the wider context, livability encompasses such cognitive or analytical concepts as the nature of an area, well-being, and standard of living in communities. Three key dimensions of livability are social well-being, economic, and environmental (Maysa & Hamid, 2020). (Figure 9) shows the 'Golden Triad' which comprises these dimensions which share common objectives like social equity, economic growth, and environmental sustainability.

Figure 9

Golden Triad of Livability



(Maysa & Hamad, 2020)

Livability in urban areas is a multifaceted and diversified concept frequently involving economic, social, physical, and environmental dimensions. It is categorized into both objective and subjective dimensions, where the objective dimension analyses the influence of physical aspects of the cities, neighbourhoods, and housing on individual performance. Individuals perceive a change in their immediate environment as impacting their quality of life, a cognitive interpretation of livability under the subjective dimension. Livability tends to cross over the ideas of quality of life and sustainability, yet for each of these concepts, the others have distinct differences. Quality of life is broader and more personal than the concept of livability. It refers particularly to a description of the external characteristics or qualities of a community or environment. Sustainability encompasses the broad aim of improving an individual or community's lifestyle. It is a singular expression of sustainability, concentrated on existing and current or physical conditions, while sustainability engulfs larger, long-range development to meet future demands. However, in recent years, the focus on urban livability studies has already shifted. Initial studies did indeed tend to focus on social matters. In recent times, urban design and planning experts have shown increased interest in the issue from physical dimensions, including focus by designers, architects, and physical planners on the five dimensions. Kevin Lynch outlined vitality, sense, fit, access, and control as a

framework in their study of livability in urban areas (Hashemkhani et al., 2024). (Table 1) states the indicators and dimensions as discussed in literature reviews.

Table 1

Dimension and Indicators of Livability from Literature Reviews

Dimensions	Indicators	Reference	Definition
Economical	Economic activities and investment	Wang et al, (2023)	The desire of private companies and organizations to invest and promote economic expansion leads to increased overall output, jobs, investment, increased rates, and factories.
	Market diversity	Hashemkhani Zolfani et al, (2023)	In the market, diversity refers to the presence of different options and alternatives accessible to consumers. Diverse brands, product categories, market segments, and price ranges can be included, enabling consumers to select based on their needs and preferences.
	Job Diversity	Ruth and Franklin (2014)	As the availability of different works and employment options.
	Housing price	Raji eta al, (2016); Furlan and Petruccioli (2016)	The cost-plus value of residential properties.
	Residents' income	Yi et al, (2021); Okulicz-Kozaryn (2012)	Income level of residents in the environment.
Social	Social participation	Blanco (2012); Ahmed et al, (2019)	Individuals' engagement in social and community activities and ideas in making decisions.
	Safety and Security	Zhan et al, (2018)	The feeling of being safeguarded against danger, harm, or threat.
	Urban management	Maleki et al, (2020); Doost Mohammadian and Rezaie (2019)	This signifies addressing issues, revitalizing, and transforming the deteriorated fabric.
	Individual sense of belonging	Tan (2020); Ahmed et al, (2019)	The connections and attachments individuals develop in the identification of their environment.
Environmental	Green space and parks	Yu et al, (2024); Lee (2021)	Availability and accessibility of parks and green areas within trekking distance.
	Sewage and waste disposal system	Valcarcel-Aguiar et al, (2018); Nour (2015)	Development of sewage networks and timely waste collection of an area or location.

Table 1 Continued

	Noise pollution	Amir et al, (2023); Nour (2015)	The availability of areas that are devoid of undesirable and disruptive sounds which include undesirable noises generated by various sources like roadways, industrial activities, and commercial activities.
	Air quality	Ahmed et al, (2019); Staricco and Brovarone (2020)	This is referred to as the availability of fresh air free from toxins like toxic gas, harmful chemicals, and smoke.
Physical	Land use diversity	Huang et al, (2018); Hashemkhani Zolfani et al, (2023)	The existence of various land uses within a particular area. It encompasses various categories like residential, commercial, cultural, educational, and natural areas.
	Quality of passages	Coteli (2023)	Addresses the state and diverse attributes of pathways, encompassing aspects like surface texture, road quality, illumination, safety measures, and additional elements that influence the comfort, safety, and effectiveness of these routes.
	Access to transportation stations	Hashemkhani Zolfani et al, (2023); Borghetti et al, (2021)	The ease and availability of using several types of transportation, including train and stations, metro systems, and different transit centres.
	Quality of facilities (electricity, water, etc.)	Baig et al, (2019); Kuijlenburg (2020)	The preferred quality of basic amenities and services.
	Recreational places	Hashemkhani Zolfani et al, (2023)	This refers to the wide variety of recreational and leisure spaces for individuals to partake in relaxing and fun activities. This suggests the existence of recreational amenities like parks, sports complexes, theatres, museums, and other entertainment locations.
	The structural strength of buildings	Sharma and Purohit (2014)	The durability and stability of the structural framework of buildings.

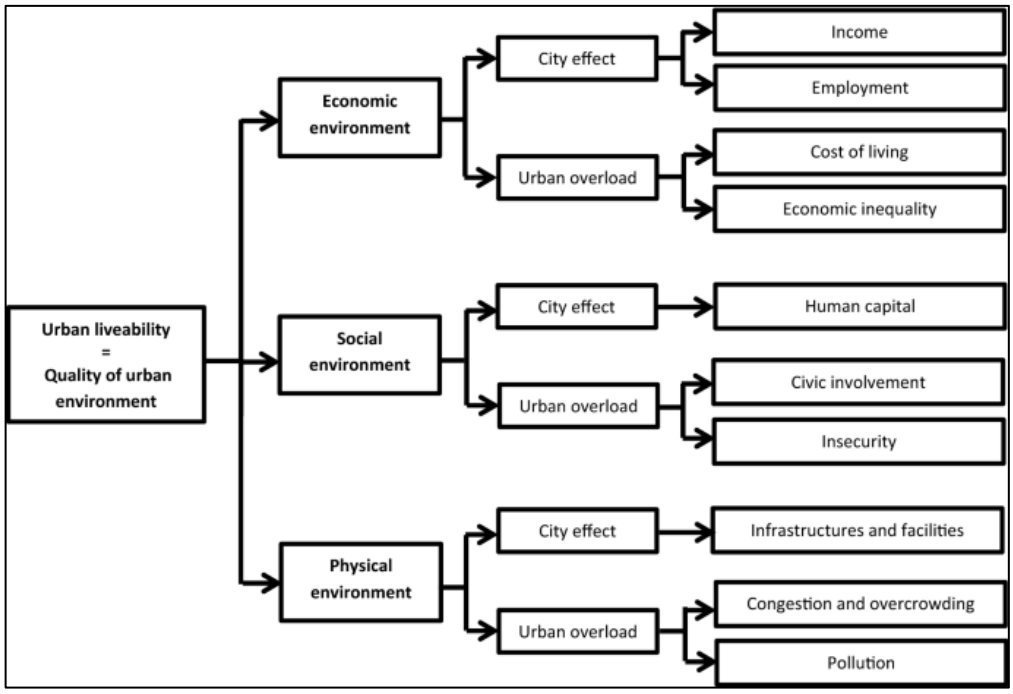
(Hashemkhani et al., 2024; edited by U. W. Mahood, 2024)

Undoubtedly, urban livability is said to be a set of concepts related to place-based attributes contributing to the standard of living and well-being of residents. The urban livability concept is multi-dimensional, which requires the overall assessment of multiple dimensions. The study considers the previously identified ones in the literature on urban livability but begins with the viewpoint of the

influence of urban metropolis. The 'city effect' and 'urban overload' concepts are concerned with the economic, social, and physical characteristics of an urban area. Economically, the city is seen as a site of economic activity, in which an urban metropolis has a helpful influence on income and employment opportunities. Large populations have a negative impact, however, on those very factors that define livability like cost of dwelling and financial inequality. The social environment symbolizes support systems in which urban individuals connect and involve themselves in social life. High concentrations of city dwellers favourably influence the overall and individual level of understanding but adversely affect civic engagement. Then the physical environment exists to support coexistence and provide surroundings for city dwellers. Urban agglomeration affects conditions of physical infrastructure infrastructures and services like health, education, culture, leisure, and transportation but also causes problems such as congestion, overcrowding, and pollution. (Figure 10) shows the conceptual model for urban livability and consists of three domains: social, economic, and physical (Valcárcel-Aguiar & Murias, 2018).

Figure 10

The Conceptual Framework of Urban Livability



(Valcárcel-Aguiar & Murias, 2018)

Importance of Measuring Urban Livability

The analysis of livability in urban areas is important for determining the people's standard of living in an area and for making decisions regarding urban planning and policy. This section will focus on the importance of evaluating livability in urban areas and how it affects and impacts the general well-being, sustainability, and socio-economic development of cities. The conceptual framework of livability includes many different dimensions that affect the individual's general standard of living and well-being in cities. As the world's cities grow faster. It becomes more important to have an accurate understanding of how well the people can live in the cities. These kinds of evaluations not only help people figure out what cities do well and what the cities could do better but also help lawmakers make cities more sustainable and accommodating for every individual.

To begin with, analysing livability is important for achieving urban sustainability. Findings point out that compact urban designs can improve community satisfaction, which is a vital part of livability (Mouratidis, 2017). Research states that the integration of sustainable infrastructure serves an influential character in enhancing urban livability through the improvement of environmental quality and the well-being of its residents. By understanding the impact of various urban designs on livability, urban designers and planners can create helpful strategies that will address dwellers' needs and encourage sustainable urban development (Lee, 2021). That is to say, the analysis of livability can help to guide urban growth strategies that highlight both the sustainability of the environment and the needs of its residents.

According to the study of Khorrami et al., 2020 studies of livability can indicate the importance of urban policy and development considerations. The multi-dimensional methods to study livability can help scholars find the particular areas that need to be improved within the urban area. This approach provides a further understanding of how various elements, such as access to amenities, economic stability, and safety contribute to a resident's standard of living. Also, the development of the Livability Composite Index can assess urban areas based on their livability parameters, thereby identifying areas that require more efforts toward enhancing the standard of livability in urban areas. (Kovacs-Györi & Cabrera-Barona, 2019).

Furthermore, several types of challenges are faced in urban areas which include rapid growth in population, poor environmental conditions, and socio-economic disparity. The assessment of livability helps in the identification of such problems in urban areas and in finding ways to address the challenges accordingly. It revealed that the expansion of urban areas tends to decrease biodiversity and causes environmental pollution thereby negatively impacting livability (Kang et al., 2022).

Additionally, livability analysis is fundamental for enhancing the well-being of the community. Livability signifies the quality of the connection between individuals and their surrounding environment, outlining the level to which urban areas achieve the needs and requirements of their residents (Kovacs-Györi et al., 2019). By assessing aspects like inhabitants' level of satisfaction, availability, and affordability of basic services and facilities, and also residential standards, urban planner designers can develop environments that improve the well-being of individuals and promote social cohesion (Baig et al., 2019). However, understanding the subjective perceptions of livability can help address different challenges faced in an urban area thereby ensuring that the development of the city is inclusive and equitable (Lee, 2021). In summary, analysing livability in urban areas is important for achieving sustainable growth, guiding policy decisions, enhancing community well-being, and tackling urban problems. As urban areas develop, an in-depth analysis of livability will be important in developing the surrounding environments that develop the quality of life for all users.

Methods for Measuring Urban Livability

Measuring urban livability involves a variety of methods that evaluate the quality of life in an urban environment. These methods can be categorized into quantitative indices, qualitative assessments, participatory approaches, and geospatial analysis. That is to say, urban livability involves a complicated approach that integrates distinct factors such as economic, social, and environmental factors. Previous studies highlight various methodologies for assessing livability emphasizing the importance of data-driven frameworks and indices. So, the following will outline the key method of measuring urban livability.

The term livability emerged in the 1980s because of environmental concerns and competition amongst urban communities to attract outside ventures and boost economies. A city's livability measurement is important in the processes of urban

planning and design. Three major livability ratings are EIU's livability Ranking, Mercer Quality of Living Survey, and Monocles magazine's Most Livable Cities Index. EIU ranks 127 world cities and is measured as the most comprehensive and common of all livability-ranking techniques, Mercer Quality of Living Survey focuses on the quality of living in more than 460 towns worldwide. The Most Livable Cities Index is a ranking system for the world's 25 most praised capitals. Other livability rating instruments link livability with quality of life, such as the EU Urban Review, the Universal Living Quality of Life Index, the United Nations Human Development Index, and Forbes (Ahmed et al., 2019).

Accordingly, the study of (Khorrami et al., 2020) systematically reviewed the indicators and methods used to assess urban livability in reviewed studies. The five-stage methodologies framework of Arksey and O'Malley was used, and 67 out of 3,599 papers met the selection benchmark. Five areas were identified to be the essential factors of livability: economic, environmental, institutional, social, and governance. Sustainability and environmental friendliness, socio-cultural conditions, and economic vibrancy and competitiveness were the most frequent subdomains. Therein, the review from a study listed seven procedures and six rating instruments used in measuring urban livability. Quantitative methods alone, such as Analytical hierarchy process and entropy, factors examination and principal component analysis, and spatial multicriteria decision-making method take 89.6% of articles while ranking tools such as livable city scientific evaluation standards, global liveable cities index and economist intelligent unit take 65.4% of articles.

Particularly, the development of composite indices that aggregate multiple indicators into a single score is a prevalent method for measuring urban livability. a multiple-layer criteria system that allocates standard values and weights to diverse livability indicators, facilitating a quantitative evaluation of a city’s adherence to livability. The approach always utilizes factor analysis to identify the key indicators affecting livability (Khorrami et al., 2020). Several livability factors include environmental quality, service accessibility, and social equity. Also, methods like geospatial analysis are one of the reliable methods that can be used to measure livability in an urban area. Utilizing remote sensing and machine learning toward assessing urban heat islands for their impacts on livability, describes the potential that technological developments offer in helping individuals to better understand the urban environment as a whole (Mirza et al., 2023). This approach enables the

analysis of spatial patterns and the identification of areas that need intervention for the improvement of livability. Nature-based solutions for improving livability conditions related to perceived thermal comfort and psychological well-being of individuals in metropolises (Mosca et al., 2021).

Additionally, quantitative and qualitative assessment methods are important for assessing urban livability. Performance assessment systems that include qualitative data in the evaluation of urban areas are important (Cheng & Lin, 2011). Participatory methods, including surveys and focus groups, grant a significant understanding of community needs and preferences thereby highlighting the importance of integrating residential preferences into livability assessments (Kovacs-Györi & Cabrera-Barona, 2019). Also, incorporating socio-economic factors is significant for a comprehensive evaluation of livability. Highlighting the complicated dimensions of livability, combining both physical and socio-cultural environments. This idea highlights the need for methodologies that account for the interactions among factors like economic development, environmental quality, and social equity (Adhikari & Roy, 2021).

However, the system dynamics model is another method that provides a comprehensive framework for analysing livability in urban areas. A model was introduced that measures the connections among different livability indicators, facilitating a broad identification of the factors influencing livability in urban areas (Cao et al., 2021). That is to say, the method enables policymakers to pinpoint critical intervention regions and assess the impacts of urban growth on livability constantly.

On the whole, measuring urban livability necessitates a comprehensive approach that integrates quantitative indices, qualitative evaluations, participatory techniques, and geospatial analysis. Adopting diverse methodologies enables researchers' urban designers and planners to understand livability in urban environments, guiding efforts to create sustainable and inclusive cities or urban areas.

Urban Area

In the United States, an urban area is a human settlement located within the centre of a large metropolitan statistical area or region and has a high population density and built infrastructure. Urban areas can be classified as towns, metropolitan

areas, or suburbs, all of which are the manifestation of urbanization. During the fourth millennium BCE, the development of urban areas resulted in the emergence of human civilization and modern urban planning.

However, human activities such as poorly harnessing natural resources have impacted the natural environment in many ways. For instance, in 1950, metropolitan regions housed 764 million people, 30 percent of Earth's 2.5 billion persons. In 2014 the numbers stood at 3.9 billion accounting for 53 percent of the population totalling 7.3 billion people. This shift was due to increased urbanization and the sum of the population. History witnessed, for the first time in 2009, the majority of the global citizens living in a metropolis, where the cities outnumbered the rural areas. Urban populations are expected to comprise 68 percent of the global population by 2050 with Africa and Asia accounting for 90 percent of this expansion, according to the United Nations.

Urban areas are described as spatial concentrations of individuals whose lives are structured around non-agricultural activities, with "urban" implying non-agricultural activities. The term "urban" is a multifaceted concept centered upon aspects like population density, dimensions of space, people-to-space proportion, and social and economic dynamics. As the global population expands, urban-rural detachment reduces, and with urban traits, infrastructure is rapidly emerging in areas that were formerly exclusively landlocked. By the mid-twentieth century, approximately two-thirds of the residents will dwell in metropolitan regions. This notable change results from a shift in population and growth, with the effects of this "urban transition" from a primarily rural, agricultural society to a solely urban, non-agricultural one expected to be comparable in intensity to the rise in global population (Weeks, 2010).

Subsequently, the adoption of legal and administrative rules and regulations and different national definitions make it difficult to compare urban areas or cities across nations worldwide. The global comparative evaluation may be biased by the wide range of variations in local unit sizes among nations. Two complimentary concepts are adopted, the city, which covers the area covered by an extensive population density area, and the Functional Urban Area (FUA), which includes additional lower-density areas surrounding a city are used to create reliable global benchmarks. Collectively, the OECD and EU created a framework for uniformly defining urban areas across the globe. When creating urban development policies,

FUAs are an effective instrument for evaluating socioeconomic and spatial patterns in urban areas or cities. They cover the entire scope of the city's workforce and urban economies. They can serve as a blueprint for local and national governments as they plan schools, transportation, infrastructure, housing, and cultural and recreational areas. The remaining local areas are divided into rural, suburban, and town regions giving to the EU-OECD functional urban area concept, which is connected to the "degree of urbanization." Although the concept of an urban area or city is the same in both definitions, the other local areas are categorized as rural areas, suburbs, and towns created on the level of urbanization (Dijkstra et al., 2019).

Moreover, cities are linear human settlements that have a higher population density compared to other regions differing by country and form of urbanization. It is made up of central cities or towns along with adjacent suburbs, frequently including once-independent towns that have been assimilated through agglomeration processes in European cities (Mela, 2014).

In summary, an urban area is described by inhabitants' population density and encompasses various human habitats such as towns, cities, suburbs, and areas where people commute. The area is defined by a dense population and significant integration of economic and social endeavours. Urban areas typically exhibit a significant presence of developed environments, unique cultural and social qualities, economic growth, improved standard of education and healthcare services, as well as increased cultural diversity. The characterization of urban areas differs across the globe.

Characteristic Features of an Urban Area

The function, structure, and social dynamics of urban areas are characterized by their unique features. These characteristics are complicated economic and social influences, a wide type of building styles, and the existence of public areas, for the achievement of efficient urban planning and design, acquiring knowledge of these features is fundamental. The identifying characteristic feature of an urban environment encompasses public space that promotes social interaction, evident sequences of areas, a favourable level of human interaction, a unique identity based on culture and tradition, and a variety of aesthetically pleasing architectural styles that contribute to the overall ambiance of physical attractions (Jacek, 2015). Another study states that urban areas entail intricate features influenced by the process of

urbanization. These can be evaluated through the application of the adoption of data analysis techniques, integrating remote detecting and wireless system information to improve urban planning and transportation strategies aimed at fostering sustainable urban development (Chen et al., 2023).

Another point is the display of intricate land-cover categories in urban areas diversified land-use designs, and unique spatial layout. The main characteristic feature covers spectral resemblance to an unadorned landscape environment, distinct spatial building structures, and the existence of development areas, as evaluated through morphological building and vegetation indices (Zhang et al., 2017). According to the study by Shaw (2021), stated that high population density, a variety of activities, multifaceted systems of movement (products, people, and technology), and the demand for efficient infrastructure and services (transport, schools, and energy) to support social, economic, cultural and political systems are all characteristic features of an urban area. The dynamics of modern capitalist urbanization and societal shifts influencing values, behaviours, and attitudes have shaped the characteristics of urban areas, which involve consumer-oriented lives, minimal and short-term acquaintances, flexibility, temporary goals to achieve, and an emphasis on individualism or self-reliance (GÜL, 2020).

However, Elias & Jose, (2023) articulated urbanity by highlighting traits that foster humanity or civil conduct, human engagement, and activities in open spaces. Fundamental characteristics encompass accessibility, compactness, dynamics facades, and safety, all of which together foster social involvement, stimulate economic activities, and create pleasurable walking spaces in urban areas. The unique traits of social, functional, and environmental connections are distinct in urban areas. The characteristics include social behaviours that are subjective, intricate urban functions, distinctive climate effects, lively public spaces, and emphasis on enhancing quality of life. (Table 2) states the key characteristics and features of an urban area.

Table 2

Characteristic Features of Urban Area

Characteristic	Defining Features	Reference
Built Environment	Urban areas are distinguished by their vast infrastructure, which includes road networks, essential services, commercial buildings, and dwelling units.	(Veckalne & Tambovceva, 2023)
Access to Services	Urban resident's standard of living is improved when they have better access to recreation opportunities, educational opportunities, and health care.	(Dijkstra et al., 2020)
High Population Density	The high population density of an urban area allows resources to be utilized efficiently but is usually marked with overcrowding.	(Dijkstra et al., 2020)
Cultural and Social Diversity	Urban areas draw diversified population demographics which promotes cultural diversity, cultural interaction, and innovation.	(Orlova, 2020)
Integration of Technology	In line with the concepts of smart cities regions frequently adopt modern-day technologies, for communication, infrastructure, and governance.	(Veckalne & Tambovceva, 2023)
Advanced Transportation Systems	Road networks, subways, and public transportation are indicators of extensive infrastructure that promote economic activity and mobility.	(Shaw, 2021)

(U. W. Mahmood, 2024).

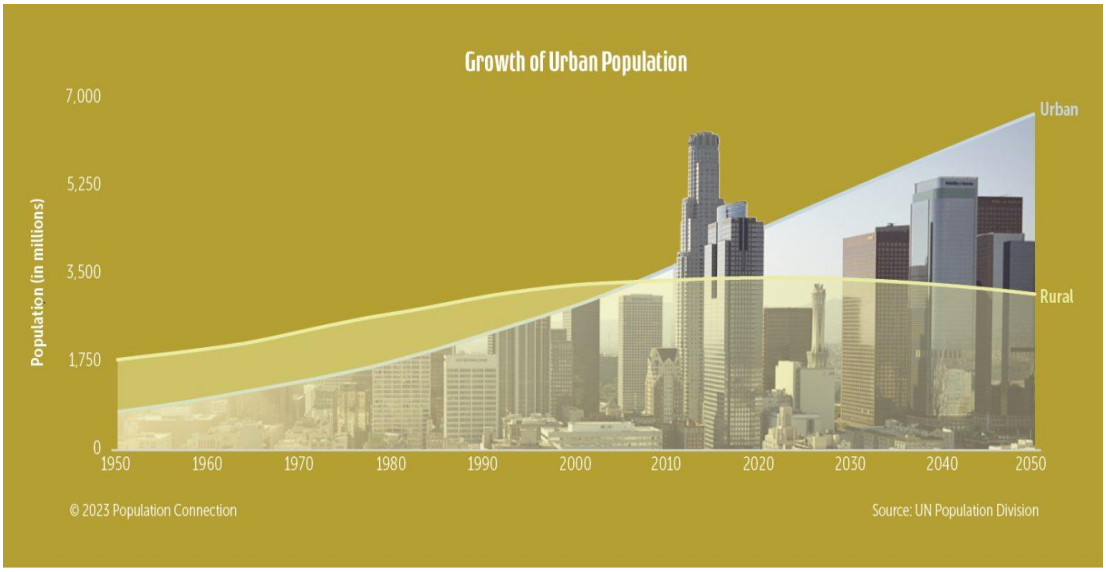
Urbanization

In the last 200 years, the process of urbanization has been a rural phenomenon, the United States witnessed a significant increase from 40 percent to 65 percent in the year 1950. In the late 1980s, India and China displayed a comparable rate of urbanization, however, with China's urban population growing to exceed 50 percent, while India's grew to 1-in-3 today. The recent developments in urbanization have been a significant trend for the past 10,000 years, with a significant rise in urban living. Historically, people lived in low-density rural areas. 1000 years ago, urban livability was not 5 percent, but by 1800 years, the urbanization rate reached around 8 percent and by 1900, it had increased by around 16 percent. This outlines the recent development of city living and its influence on the global environment. United Nations World Urbanization predictions point out that global urbanization rates are predicted to rise by 2050, resulting in 1 out of 7 individuals residing in urban areas by 2050. So limited number of countries

including some in sub-Saharan Africa, the Pacific Island, Asia, and Guyana in Latin America, are expected to have higher rural populations compared to urban areas (Ritchie et al., 2024). The line graphs in (Figure 11) indicate that global urbanization is anticipated to persist, with an increasing population of individuals residing in urban or rural areas throughout the globe from 1950 to 2050.

Figure 11

Urbanization Projections from 1950-2050



(Growth of Urban Population Infographic-Population Education, 2023)

More so, urbanization is the term used to describe the migration of individuals from remote areas into metropolitan settings, developing, and building up the city's landscape. It involves a change in the natural setting and rural setting to the urban setting and is usually based on population increase, economic development, and industrialization. This growth of population contributes to urbanization, by which a town or a city will confront the change in density and changes in economic, social, and cultural qualities. A lot of effects can be considered: higher availability of several types of services and opportunities in cities along with challenges concerning the rate of growth of the population and inequalities within societies (What is Urbanisation, 2023).

Subsequently, the growing population in urban areas resulting in the growth of cities and towns is referred to as urbanization. It is said to be closely related to industrialization and the shift from agrarian economies to industrial and serviced

base ones. The key characteristics of urbanization include population growth, development in infrastructure, social changes, urban sprawl, environmental impact, advancements in technology, and economic transformation. Cities and towns become hubs for better standards of living, economic activities, and job opportunities, thereby attracting people from rural areas seeking an improved standard of living or quality of life. Rapid urban growth leads to the construction of roads, bridges, utilities, and public transport systems to make the quality of the urban lifestyle sustainable. Advancements in technology and the concentration of business activities in urban areas also significantly affect people's lives. Sustainable urban sprawl is vital in mitigating the environmental impact of urbanization (What are the Main Characteristics of Urbanization, 2023).

Urbanization, in particular, affects the culture, the economy, and the environment both positively and negatively. For example, the majority of the global population will be accommodated in urban regions, increasing employment opportunities, and creating products and amenities. Urbanization does mean a challenge in providing transport systems, basic facilities, and shelter. The expansion of the cities has caused a higher rate of air pollution, garbage creation, and a higher consumption of energy due to its adverse effect on the environment. In addition to this, it burdens the government with pressure to provide public services such as housing and infrastructure, among others. Yet despite such challenges, it is perceived that urbanization does come with opportunities such as job creation and economic growth (Chandaneshwari & Ram, 2023).

Challenges of Urbanization

Additionally, urbanization is enabled by economic, social, and environmental influences, such as modernization, demographic expansion, and employment prospects. Unregulated urbanization can lead to environmental deuteriation, land instability, and air contamination. Nonetheless, under certain constraints, it can also result in enhancements in infrastructure, healthcare, transportation, education, and quality of life (Humbal et al., 2023). (Figure 12) shows the different urbanization issues that are being faced in urban areas.

Figure 12

Emerging problems due to unplanned Urbanization

(Emerging Challenges due to Urbanization, 2023)

In a nutshell, urbanization is a significant cause of socio-economic alterations, public health issues, and environmental transformation, addressing the complex effects of urbanization necessitates comprehensive strategies that incorporate sustainability in the environment, public health, and economic development. Efficient designing of urban areas that integrate green zones, advanced basic facilities, and environmental threats is vital for achieving sustainable urban growth.

Sustainable Urban Growth

Sustainable development first appeared in the late 1800s as a response to the effects of urban expansion on remote and green spaces. In 1972, Meadows et al. were the first authors to use sustainable terminology in research regarding human development patterns that with the current trend of humanity development and consumption of current resources, tragic destruction will happen to the global

environment in the 2000s if it keeps on going. At the 1972 UN Conference on Human Environment in 1973, individuals accepted that nature and resources in the environment should be cared for and protected in the right manner for the next people. That is to say, sustainable development is aimed at an improvement of quality of life from an economic, social, and environmental perspective, it focuses on fairness between generations and social justice. The three parts of sustainable growth can be seen in (Figure 13), (Abdullahi & Pradhan, 2017).

Figure 13

Three Aspects of Sustainable Development

(Abdullahi & Pradhan, 2017)

Sustainable urban growth or development is an essential issue in the 21st century, emerging prominently in the 1980s with the International Union for the Preservation of Environment and Organic Resources' World Protection. The concept focuses on balancing urban growth with environmental protection, ensuring equity in employment, basic services, transportation, and shelter. It encompasses several types of sustainability including environmental and social sustainability, addressing significant urban challenges such as inadequate housing, urbanization, urban poverty, and pollution. The essence of sustainable urban growth or development includes meeting the present-day needs without compromising the capacity of forthcoming generations to meet their requirements, thus ensuring a stable connection between social activities and the environment (Bera, 2020).

Also, the growth of a sustainable urban is the development of the area without compromising the needs that are to be met currently by the needs of the future generation, based on economic, social, and environmental sustainability (Hager, 2023). It involves developing cities that ensure the well-being of individuals while preserving their urban ecosystem services. Key factors include efficient public transportation, renewable energy use, sustainable buildings, and addressing challenges posed by high-density urban forms on biodiversity and green zones (Li, 2024). The pursuit of sustainable urban growth seeks to enhance human progress in an approach that concurrently supports the environment, economy, and society, all while ensuring fairness across different generations and within the same generation. The United Nations has established 17 targets to be achieved by 2030, aimed at enhancing health, promoting equality, and addressing climate change, encompassing environmental, social, and economic dimensions of sustainability (Nguyen et al., 2023).

Also, sustainable growth aims to meet the demands of the current generations while putting into consideration the demands of the future generation. It encounters challenges such as the "tragedy of the commons" and the compact city system. Strategies such as urban renaissance, smart growth, and new urbanism advocate for concepts including dense and compact development, transit-oriented development, mixed land use, and designated physical city growth boundaries. Nonetheless, these approaches encounter critiques and must adapt to the constantly evolving landscape. Integrating mixed-use development, establishing walled cities, and promoting urban compaction is important for achieving sustainable growth. The importance of sustainable development for the future cannot be over-emphasized. Architects, designers, policymakers, and advocates need to present real-life scenarios of sustainable practices across different contexts (Oktay & Conteh, 2007).

In short, from the review of studies sustainable urban growth is a multifaceted process that needs a general methodology in integrating social, economic, and environmental attributes. The sustainable urban development concept emphasizes efficient planning of urban areas that harmonizes the increase in population growth with urban expansion, ensuring that the cities can support their residents without jeopardizing environmental integrity. This is significant in the framework of fast urbanization emerging in various nations, where the speed of urban land use frequently overtakes population growth, thereby resulting in

inefficient utilization of land and intensified environmental degradation (Bhandari et al., 2023).

In a nutshell, sustainable urban development embodies the needs of people in cities within an environmentally sensitive framework. Cities function as motors of development, fulfilling crucial roles at the national, local, and economic levels. They are homes to mega populations, and employment avenues, and perform vital functions at the national, local, and economic levels. They support large populations, and provide employment opportunities, shelter, and services, while also facing challenges associated with rapid growth. Urban strategies rely on sustainable development, characterized as a dynamic and multi-directional process that safeguards the environment (Kara, 2013).

Principles of Sustainable Urban Growth

Understanding the importance of sustainable urban growth is fundamental in addressing the issues due to rabid urbanization, social inequality, and climate change. The concept surrounding sustainable urban growth highlights the importance of designing urban areas that harmonize economic, environmental, and social standards. This method highlights the significance of cohesive planning and the effective utilization of resources to promote strong and resilient urban environments. The subsequent sections delineate the essential principles of sustainable urban growth or development.

Particularly, sustainable urban growth promotes economic vitality through the enhancement of mixed-use urban centres that combine residential, green, and commercial spaces. Advances like minimizing urban sprawl and improving access to public transportation show a meaningful position in encouraging economic efficiency and enhancing the well-being of the community (Hammed, 2021). Also, according to the study (Li, 2024) incorporating sustainable building practices and renewable energy sources is significant for minimizing the emissions of carbon and urban environment preservation. Urban growth models are expected to align with environmental conditions, ensuring that the use of resources is sustainable and adaptive to local conditions (Ugalde-Monzalvo, 2024). Sustainable urban growth must make sure that all members of the community allow access to essential facilities public spaces and green areas to prioritize social equity (Singh et al., 2024). Engaging members of the community in planning processes fosters a sense of

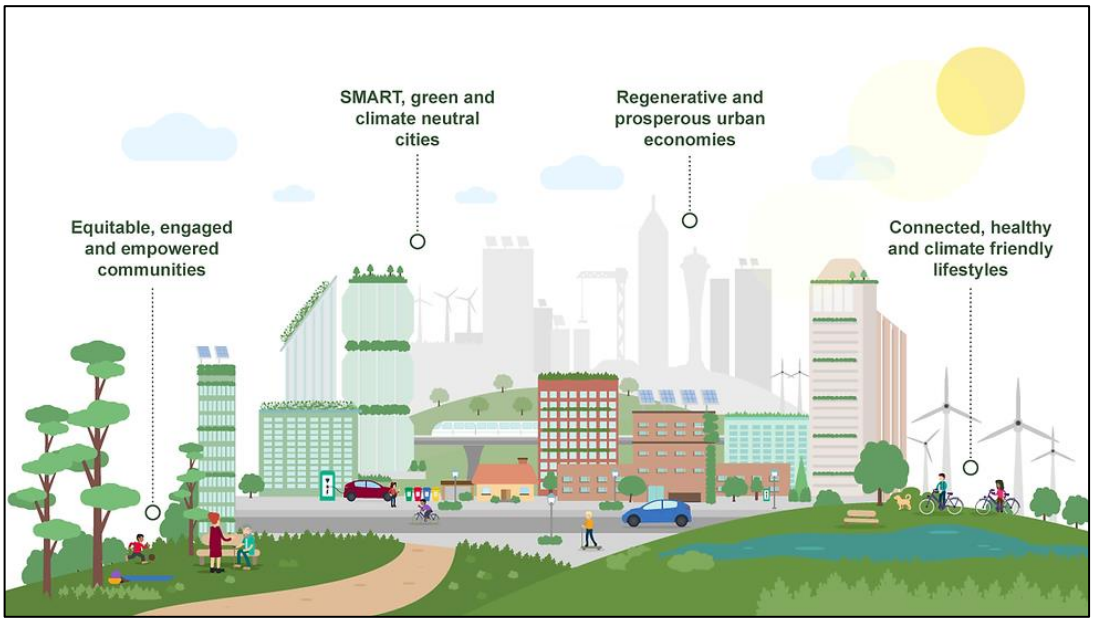
belonging and also enhances the effectiveness of sustainable programs (Cepeliauskaite & Stasis, 2020).

Therefore, sustainability in urban areas facilitates socio-economic, demographic, and technological development. The primary principle of sustainable growth encompasses enhancing the value of life, exploring development alternatives, preventing poverty, ensuring adequate employment, addressing basic health needs, safeguarding, and promoting biological diversity, advancing technology, managing population growth, utilizing renewable energy securing clean water resources, and mitigating risks. The European Environment Agency (EEA) identifies five key principles for sustainable urban development: environmental capacity, reversibility, resilience, efficiency, and equity. Further objectives encompass reducing the depletion of spatial and environmental resources, optimizing urban flows, safeguarding urban inhabitants' health ensuring equal access to resources and services, and preserving social and cultural variety. The process and principles must exhibit flexibility, considering the distinct circumstances and potentials of each city (Kara, 2013).

Furthermore, questions like are it necessary for a city to rely on its adjacent towns and suburbs? Is self-reliance achievable? Urban sustainability refers to the capacity of urban areas to achieve self-sufficiency regarding water supply, resource distribution, need for energy efficiency, and food production. Urban areas ought to generate their energy, ideally through renewable resources, thereby decreasing the level of pollution and mitigating their impact on climate change. Efficient land use should also be implemented alongside waste minimization. The urban areas are expected to see a high rise in the population by the year 2050. According to projections, the total number of inhabitants on Earth will see seventy percent 70% of the world's population living in towns and growth drivers in the future with the use of technology (What are the Principles of Urban Sustainability, 2021). (Figure 14) shows the principles of urban sustainability.

Figure 14

Urban Sustainability Principles



(What are the Principles of Urban Sustainability, 2021)

Hence, the sustainable urban growth principles encompass dense and multi-cultural environment prioritization of quality-of-life oner quantitative diversification, localism, keen sense of place, and transparency in producer and consumer relationships. These principles also aim to address barriers such as land speculation and non-local property ownership that impede effective and sustainable urban growth (Stanley, 2017).

However, one study mentions twelve such basic principles that are density, energy efficiency, urban microclimate, solar/heat, building services, embodied energy, operational energy, maintenance, ventilation, materials transportation and construction, post usage, and design. Design is kept deliberately at the end so that before engaging with the design aspect, all the other principles are considered. The analytic framework represents each principle by contributing to a series of theories and strategies toward attaining sustainable urban design. Simultaneously, various values among these are precise, thus allowing planners and policymakers to rethink conventional approaches toward the quest for new development models. This is certainly something that should be accomplished at the very phase of planning and designing rather than later stages when the effects of climate change are at an all-time high (Cheshmehzangi et al., 2022).

Importance of Sustainable Urban Growth

Sustainable urban growth is important for solving problems associated with rapid urbanization, climate change, and resource decline. It highlights the necessity for urban areas to adjust to environmental limitations while fostering the economic and social welfare of the people. The following writing explores the utmost significant aspects of sustainable urban growth.

Indeed, the implication for economic and social factors urban areas generate over 80% of the universal GDP while being accountable for more than 70% of greenhouse gas discharges. Sustainable urban growth addresses problems such as insufficient housing, inadequate infrastructure, and environmental degradation, promoting inclusive achievement (Sustainable Cities and Communities, 2022). Urban adaptation and environmental fitness are also other important aspects, sustainable urban growth patterns can be classified according to environmental suitability, which evaluates the availability of resources and urban adoption. Six growth patterns consist of efficient growth, economizing growth, weak growth, and efficient growth, and of the venture, deficient growth, and degradation are also deficient growth, indicating the importance of integrating urban development with environmental resources (Ugalde-Monzalvo, 2024).

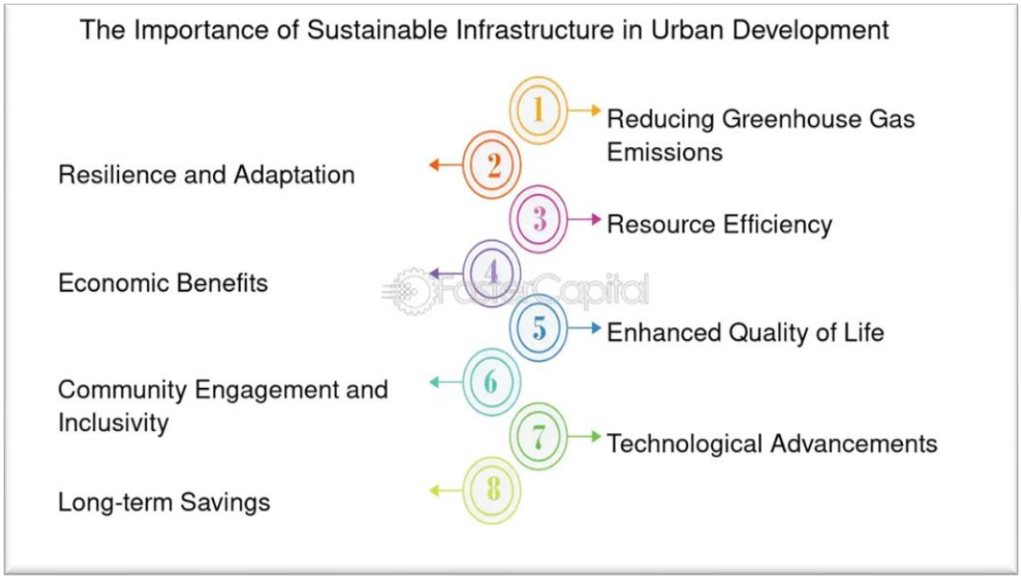
Correspondingly, under the planning and policy considerations, policymakers should adopt sustainable practices to improve urban resilience and mitigate inequalities intensified by crises that may occur like the pandemic in 2019 (Sustainable Cities and Communities, 2022). Also, a comprehensive method for urban planning is important for achieving a balance relating the three priorities environmental, social, and economic aspects of sustainability (Singh et al., 2024). Unprecedented urban growth, exemplified by cities such as Dhaka, results in significant ecological and social challenges, highlighting the necessity for sustainable urban growth strategies to promote long-term resilience and viability (Khan, 2024). Another study states that it is essential for tackling problems like change in climate, depletion of resources, and social inequality. It fosters economic vitality, social inclusiveness, and environmental responsibility, guaranteeing that cities remain resilient, inclusive, and environmentally aware for future generations (Singh et al., 2024). Sustainable urban growth is essential as it includes economic, social, environmental, cultural, and political dimensions, facilitating equitable

distributive justice and future societal demands. It improves life quality and fosters balanced structural changes within communities (Hariram et al., 2023).

Long-term sustainability is further sustainable for urban growth, creating a foundation for resilient, adaptable, and environmentally responsible urban areas. In this light, the achievement of net-zero energy in urban planning is considered important in the perspective of mitigating climate change, thus fostering economic growth, and upgrading the well-being of the city population. The focus on sustainability allows the creation of an environment by cities that cater to current needs while facilitating an extra-sustainable future (The Importance of Sustainable Infrastructure in Urban Growth, 2024) as shown in (Figure 15).

Figure 15

Importance of Sustainable Infrastructure in Urban Growth



(The Importance of Sustainable Infrastructure in Urban Development, 2024)

Sustainable growth is attributed to demographic changes is of great significance. A report from the United Nations indicates that these changes can significantly impact sustainable growth. Failure to consider these changes will undermine the efforts to promote sustainable growth. Further reasons clarify the significance of sustainable growth:

- Sustainable growth guarantees the prudent value of resources, preserving the availability of coming generations.

- Nature maintains ecological health by safeguarding air, water, and habitats, thereby ensuring the safety of all living creatures.
- Sustainable urban growth facilitates cost reduction through decreased energy consumption and waste generation.
- Equitable distribution ensures that all people obtain access to supplies and chances, thereby promoting fairness.
- Climate change is addressed, sustainable development mitigates the harmful effects of climate change through utilization of cleaner energy and the preservation of nature.
- Healthier living is facilitated by reducing pollution, which results in cleaner water and air, access to nutritious food, and the availability of green spaces for recreation.
- Equipped to address challenges, sustainable growth, and development prepare societies to effectively address issues such as natural disasters, economic difficulties, and health crises.
- Collaboration is promoted, it encourages collaboration among nations and individuals to address significant issues.
- The consideration for future generations as sustainable growth and development ensures that future generations can also enjoy an exceptional quality of life.
- Life is improved for all individuals, initiative seeks to enhance the quality of life through a clean environment, equitable employment opportunities, and a just society.

The aforementioned reasons emphasize the significance of sustainable growth and development in fostering a balanced and respectful interaction with nature, enhancing social and economic well-being, and constructing a more equitable future for all (Sharma, 2020).

Factors Influencing Sustainable Urban Growth

Sustainable urban growth and development are influenced by numerous issues, including social, economic, environmental, and institutional dimensions. Comprehending these factors is essential for formulating effective strategies that enhance sustainability in urban environments.

Accordingly, a key factor affecting sustainable urban growth is the incorporation of sustainable urban practices within urban planning and designing. The implementation of small-scale sustainable practices in densely populated urban areas can decrease car dependency and improve environmental effects. This points out the necessity of implementing flexible and dynamic methodologies that emphasize sustainability, particularly in light of rapid urban growth and population rise. Practices such as developing mixed-use neighbourhoods, enhancing green areas, and improving public transportation methods contribute to the reduction of the ecological footprint in urban areas as asserted by (Miączyńska & Borkowski, 2023). Economic factors play a crucial role in determining sustainable urban growth. The relocation of inhabitants to urban areas is frequently motivated by the search for improved economic opportunities and living conditions.

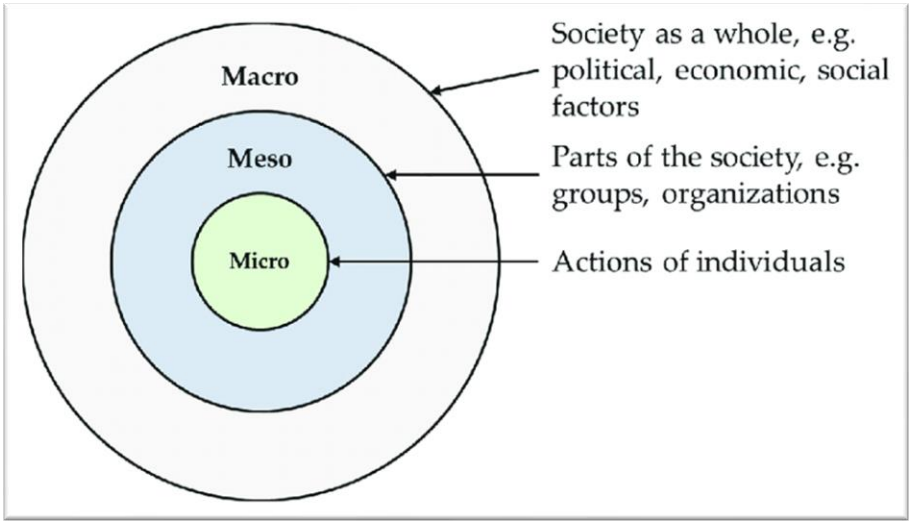
Correspondingly, existing literature shows that the evaluation of sustainable growth in cities can assist urban designers and stakeholders in enhancing their strategies or solutions. While no definition has been accepted, there exist three broad pillars for defining sustainable development: economic, environmental, and social. From a social perspective, there is no limit to the following aspects that are included: population demographics, transportation and access, and resource use. Economic factors in this perspective are also crucial, expressed in terms of workforce involvement rate, per capita income, spreading of economic activities, and the division of small commodity economies. Besides, other important environmental factors affecting the projects of urban growth include trash collection, electricity use, air quality, utilization of water, and noise. In addition, it has to do with social, economic, and environmental dimensions in sustainable urban growth (Bai et al., 2023).

The micro, meso, and macro environments directly influence the chances to foster sustainable urban development. Microeconomics focuses on the behaviour of individuals and firms operating within a context of scarcity, whereas mesoeconomics serves as an intermediary level between microeconomics and macroeconomics. The efficiency of sustainable urban growth is dependent upon many elements, such as but not limited to urban regulations, size of the urban area, infrastructure, landscape, urban renewal, quality of the urban environment, affordable housing, housing needs, occupants' attitude, energy use, land use, social inclusions, natural heritage

possessions, and built heritage properties, city's viability and official structure of the city. (Edmundas et al., 2004) As shown in (Figure 16).

Figure 16

Meso, Micro, and Macro Factors Influencing Sustainable Urban Growth



(Javaid et al., 2019)

Another one is macroeconomics which functions at the level of the national economy and focuses its attention on the interrelationships existing among average prices, employment, income, and levels of production along with what impact is made by the level of taxes, government expenditures, and budgetary consideration, macro-economic thus has a direct effect on the sustainable growth of cities. The formulation of strategies for the town and finding implementation measures by studying problems that exist for or against the potential of growth are worked out. Sustainable urban government is effective to the extent that the objectives of urban residents and enterprises are achieved. The efficiency and scope of operations depend upon the following macros factors- employment, income, taxation, interest rate, inflation, the informal economy, economic development, prosperity, globalization, demographic shifts, education, climate change, political condition, social dynamics, cultural aspects, environmental concerns, poverty, legislation, demand and supply, and government intervention (Edmundas et al., 2004) as shown in (Figure 17).

Figure 17

The Eight Factors Influencing Community Growth

(Hampton et al., 2024)

Moreover, economic, legal conditions, and politically sustainable urban growth environments encompass a city's legal framework, administrative bodies, and stakeholder groups that shape and regulate the actions of diverse organizations and individuals. Governments can enact legal measures that establish more advantageous conditions for specific enterprises or individuals, promote investments, or restrict certain activities. The technological environment is a critical determinant of urban features, necessitating substantial investments in scientific research and innovative technologies (Edmundas et al., 2004).

The social and cultural urban environment involves institutions and all the issues that contribute to the development and modification of principal social values, regards, and behavioural measures. Cultural features determine the process of adopting or rejecting business decisions and values deeply rooted in the identity of each society. However, the natural environment, including air pollution, water scarcity, and environmental issues, significantly influences sustainable urban growth. Numerous enterprises in transition countries face challenges in fulfilling their

obligations related to environmental issues. In contrast, some companies tackle these challenges by manufacturing environmentally friendly products, utilizing recycling or biodegradable materials, upgrading treatment facilities, and implementing energy-saving initiatives (Edmundas et al., 2004).

Indicators for Measuring Sustainable Urban Growth

The research team referred to an indicator as "statistical sequence, and all other methods of indication facilitating the assessment of our current position and trajectory concerning our values and goals." Indicators may consist of quantitative measures as well as qualitative measurements. Quantitative findings are typically presented in numerical terms, however, excessive dependence on these metrics may neglect other significant information. Indicators are influenced by the objectives of the group that develops them and are shaped by conceptual frameworks that delineate the value judgments inherent in the examined concept. Some indicator methods combine composite indicators or indices found through the collection of data, while others present results from social science through the use of survey research. The study team explored the definition of the term "benchmark," which is defined in studies as "a reference point in determining the current situation or position comparative to the stated objective." A benchmark would function as a reference, an indicator and an assessment of status and benchmarks may use a common dimension or scale. However, one indicates the current location or destination while the other highlights a significant value for comparative analysis (Lynch et al., 2011).

Therefore, the land usage rate to the population growth rate is a significant indicator that measures sustainable urban growth, as underlined by the United Nations SDG 11.3.1. This index offers information on the effectiveness of land use concerning the population and helps identify sprawl and inefficiencies in land use. It will be important to monitor this ratio because it will enable urban planners to assess the sustainability of urban growth and its impacts on land consumption and environmental degradation. (Li et al., 2021). (Figure 18) shows the sustainable development goal 11.3.1. as an indicator for measuring sustainable urban growth.

Figure 18

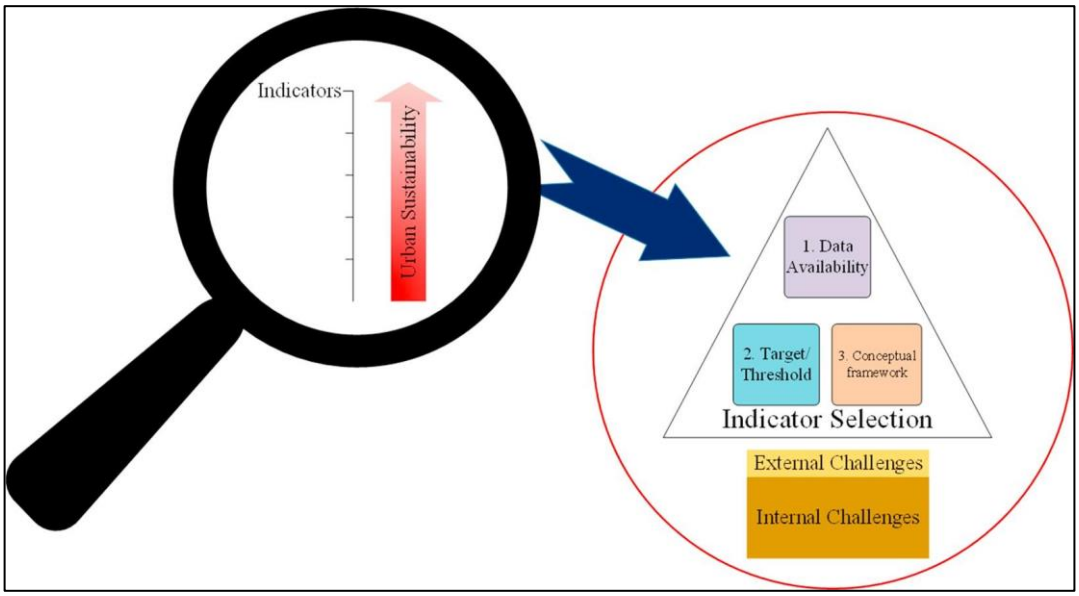
Sustainable Development Goal 11.3.1

(SDG 11, 2022)

Particularly, urbanization is a critical issue that shapes the human relationship with the ecosystem, measuring the progress in urban growth, whether sustainable or unsustainable, necessities quantification through appropriate sustainability indicators There is a general lack of awareness of what the word sustainability and its context and understanding mean to different countries and various economic classes in society. This review is intended to identify the issues that are affecting the development and achievement of sustainability indicators in urban areas, and it provides corrective recommendations. From here, two major classifications of challenges according to their development and implementation phases and three primary criteria for the use of urban sustainability indicators were identified. (Verma & Raghubanshi, 2018) as shown in (Figure 19).

Figure 19

Three Preliminary Criteria for Sustainable Urban Growth Indicators



(Verma & Raghubanshi, 2018)

Last of all. The sustainable urban growth framework variables exhibit considerable variation due to their required breadth. To enhance the understanding of intra-variable diversity, researchers developed an additional third tier for sustainable urban growth framework, referred to as a sub-element. The emergent sun elements were organically generated from the natural groupings of the existing list of indicators. The research team reviewed the 145 listed indicators, sorted by element, and assessed each indicator to qualitatively understand what particular facet of each variable that indicator represents. They developed several common thematic categories using various facets. The team identified several important sub-elements that are either underrepresented or not represented at all in a few cases (Lynch et al., 2011). (Table 3) shows the developed indicators based on the common thematic categories.

Table 3

Developed Dimensions Based on Indicators and Sub-Indicators Categories

Dimension	Indicators	Sub-Indicators
Economic Opportunities	Competitive and diversified local and regional economy	-Equal Opportunity and Mobility. -Reasonable Tax and Regulation Costs. - Health Business and Industry Mix. - Growing Community and Individual Wealth.
	Growth plans that leverage existing assets	
	Transportation and other infrastructure coordinated and land use	-Density and Agglomeration. -Infrastructure Assessment and Investment. -Travel Times and Time to Move Goods.
	Access to capital and credit	-Entrepreneurial Support and New Business Starts. - Capital and Credit Flows to Industries. -Protection of Assets, Stable Prices, and Stable Economy.
	Access to education, jobs, and training	- Jobs and Unemployment. -Access to and Completion of Quality Education and Training.
Social Wellbeing	Health	-individual Health- Adult Population. -Individual Health- Children. -Social Justice/ Equity. -Public Health Measures (e.g., hospitals, insurance).
	Safety	-Property and/ or Voilet Crime. -Crime Protection Services. -Crime Factors (e.g., gangs, juvenile data). -Resident Accidents (e.g., vehicular).
	Local or Civic Identity/ Sense of Place	-Social Capital. -Civic Engagement. -Community Programs. -Place Cultural.
	Access to Affordable Housing and Services	-Rent Gap/ Housing Overhang. -Subsidies for Affordable Housing. -Location Choice/ Proximity to Work. -Unit Sizes/ Overcrowding. - Access to Affordable Housing.
	Access to Public Recreation and Open Space	-Proximity to Public Recreation and Open Spaces. -Condition/ Services of Public Recreation and Open Spaces.
	Access to a Variety of Transportation Options	-Cost of Choices Relative to Disposable Income. -Mode Choice. -Proximity to Different Modes. -Travel Time to Work.

Table 3 Continued

Environmental Quality	Efficient land use	-Inside Game Actions (e.g., mixed-use, high density, pedestrian friendly). -Outside Game Actions (e.g., conservation, rural development restrictions).
	Efficient resource use	-Reduce. -Reuse. -Renewables.
	Minimization and management of waste/pollution	-Production. -Treatment. -Prevention.
	Mitigation, adaptation, and resilience of natural disasters and climate change.	-Mitigation. -Adaptation and Resilience.
	Carbon-efficient, environmentally sound, transportation	-Non-Motorized Vehicles. -Ration of Public to Private. -Emissions.
	A diverse natural environment and functional ecological systems	-Natura Environment quality and diversity. -Natural Area Coverage/ Extent.

(Lynch et al., 2011; edited by U. W. Mahmood, 2024).

The research table above sought to define the scope of each element and confirm that the chosen indicators adequately encompass all aspects of each element. The process of grouping the sub-elements allowed the group to identify the sets of indicators that comprise each component and how those groups correspond to the basics that were proposed by the Working Group. In other words, the sub-elements represented the coverage and diversity of the indicators across elements; thus, providing an avenue for understanding the nature of distinct types of indicators related to each component. Their value was particularly important in the economic and social spheres, in which coverage over the elements is very unequal. Further economic dimension indicators are needed to operationalize the measurement of equal chance and movement, density and growth, investment and structure evaluation, travel times and coordination for goods movement, capital and credit distribution to businesses, provision for entrepreneurship and new commercial formation, as well as asset protection price stability, and economic stability. Significant gaps persist in the social dimension, particularly those related to social capital, social cohesion, and a sense of place that is not easily quantified. The categories of economic and social dimensions can inform the expansion of indicators and ensure comprehensive coverage of the sustainable urban growth framework (Lynch et al., 2011).

Challenges of Implementing Sustainable Urban Growth

The rapid pace of urban growth, specifically in low-income and lower-middle-income nations, represents a significant challenge. Herb et al. emphasize that these regions frequently lack the requisite capacity and resources to effectively manage the rapid changes linked to urban growth. The study of (Harb et al., 2020) revealed that rapid urbanization focuses on highly vulnerable areas to various forms of environmental hazard, hence leading to the call for the implementation of sustainable urban policies. Unless adequately managed, a poorly developed infrastructure and inadequate provision of services in rapidly expanding urban areas may exacerbate such issues like inequality, poverty, and environmental degradation, which turn out to affect the SDGs negatively, particularly SDG 11: Sustainable Cities and Communities.

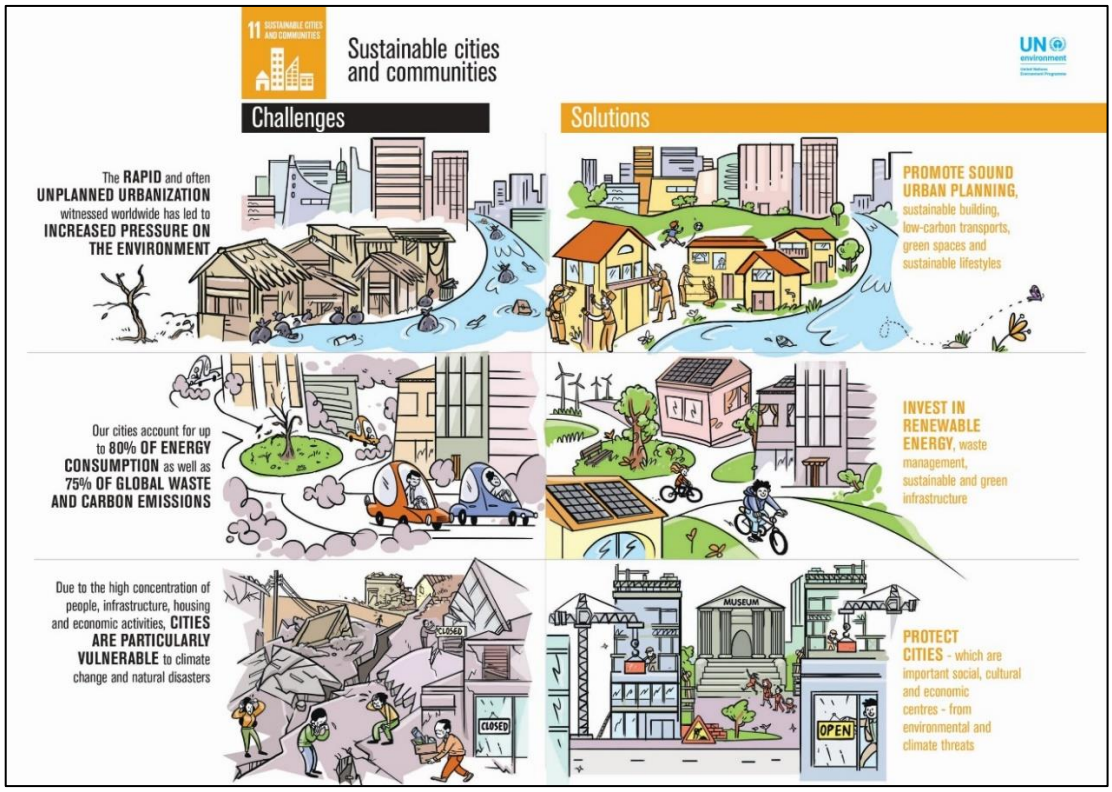
Another corresponding example is that slums and informal settlements are not considered during urban design and planning. Even though the advanced policies of sustainable urbanization have been adopted, informal settlements remain an important challenge in most advancing countries where 90% of the global urban growth is concentrated. In most cases, the local governments lack the appropriate technical and financial resources to produce and implement effective policies for the incorporation of these informal settlements into the broader urban structure. The findings were exclusive and increased vulnerability for residents in those regions, who always face inadequate access to basic infrastructure and services (Jones, 2017). Sustainable urban growth practices face several problems like economic constraints, policy differences, and repair issues. These obstacles hinder the effective integration of sustainable infrastructure, which is important for improving urban resilience and achieving sustainable development in urban design and planning (Adesina et al., 2024). Urban areas face challenges including loose urban growth, inadequate public infrastructure, and limited citizen engagement in governance. Addressing these issues is necessary for the achievement of sustainable urban growth, requiring a shift towards smart and environmentally sustainable practices (Berawi et al., 2023).

However, many challenges need to be addressed to ensure the achievement of the objectives of sustainable urban growth regarding social, environmental, and economic sustainability. These multi-dimensional challenges have a scope ranging from inadequate infrastructure to political instability to the deterioration of the natural environment. These challenges could only be addressed by understanding the

environment of the urban area with strategic interventions. Elevated levels of poverty and social inequalities ensure limited access to basic amenities and increase problems relating to sustainability in an urban area (Azhar et al., 2024). Lastly, green infrastructure could help enhance urban resilience, but financial constraints and policy gaps have hindered its implementation in most cases (Adesina et al., 2024). (Figure 20) illustrates some of the major problems and their respective solutions for the implementation of sustainable cities and communities.

Figure 20

Key Challenges and Corresponding Solutions



(Environment, 2017)

Therefore, the political situation is also an important determinant in the implementation of sustainable urban initiatives, studies reveal that differences in political vision among leadership results in discontinuity in the development of sustainable urban development initiatives. Inconsistent policies and a lack of long-term commitments to sustainability interfere with progress and result in divided approaches that do not adequately address the complications of urban growth (Tatenda & Pisa, 2018). The challenges posed regarding implementing sustainable

urban growth derived from earlier studies are somehow intricate and interconnected. Key elements that highlight sustainability include rapid settlement, political fragmentations, environmental risk factors, economic constraints, and technological integrations, among others that do take place. The achievement of these includes policy coordination, urban design and planning, and community togetherness for resilient, equitable, and sustainable urban environments.

Strategies for Achieving Sustainable Urban Growth

Accordingly, sustainable growth in the urban environment requires proper handling with inclusive and equality considerations among the social, economic, and environmental sources, which so far have many strategic approaches. Many strategies concerning the causes pointed out necessary planning considerations and the relevance of communities' participation appropriately. Such are outlined through the identification of key strategies.

First and foremost, public engagement and inclusivity are necessary in designing and planning urban areas to achieve sustainable urban growth. Previous studies reveal that formalizing informal settlements, alongside residents' input on the decision-making process provides more equitable and efficient methods of urban policy. This participatory approach considers the needs and demands of all members of the community or neighbourhood. With this, social bonds and resilience will be enhanced (Jones, 2017). Appropriate management resulting from integrated urban design and planning deals with the associated challenges of urban growth. Repeating the necessity of spatial planning and regional development initiatives regarding decreasing conflict of land usage and achieving sustainability of the land. Cities and communities can achieve this through the coordination of efforts across different sectors and government levels in developing and implementing strategies that enhance sustainability (Agha, 2020).

Hence, urban policies will help facilitate increased population density within the existing city limits to achieve efficiency in land use and avoid urban sprawl. One approach towards attaining sustainable growth in cities is to implement adequate urban policies to increase the number of houses in developed areas. This strategy tries to minimize urban sprawl and reduce the demand for greenfield development. It is believed that improvement of city development can improve the long-term sustainability of built-up areas since accommodations near centres and transport

points encourage efficient use of land and reduce dependency on private cars (Samzadeh et al., 2016). Smart growth principles favour compact, walkable communities with mixed-use design. That says much about developing neighbourhoods that are more accessible and sensitive to the environment. Smart growth plans include a mix of housing types, complete streets, and neighbourhood schools, adding to livable urban environments (Zhang &Yang, 2018). (Figure 21) shows the strategic goals related to sustainability for achieving sustainable urban growth.

Figure 21

Goal Related to Sustainability Strategies

(Malta's Sustainable Development Strategy for 2050, 2024)

The other core approach is the Transit-Oriented Development (TOD) which looks at the concentration of urban development centered around centres of public transportation. It encourages walking, cycling, and public transit to reduce GHG emissions and enhance access. Since it has integrated land use and transportation in a manner that develops sustainable mobility with reduced automobile dependence, the concept of TOD has taken centre stage in the processes of urban planning and design (Papa & Bertolini, 2015). The presentation of digital technologies within the framework of digital transformation and smart cities is for sustainability. Smart city

initiatives review and manage environmental impacts while developing the quality of life and well-being of residents. By better use of data and technology, cities can make better use of their resources, deliver services more efficiently, and engage their citizens in sustainable practices (Derlukiewicz et al., 2023).

Another strategy involves flood risk management and resilience planning. In light of the growing hazard that climate change presents to cities, flood risk should be incorporated into urban planning and design. Significantly, alignment in urban development and disaster mitigation for sustainable urban growth be sought, especially for disaster-prone areas. Such initiative-taking approaches will make the resilience of urban areas stronger to protect them against environmental threats (Vinh Hung et al., 2010). These could form effective means of improving ecosystem services in urban areas for sustainable development. The urban regeneration strategy had different effects on vegetation growth and, more so, on urban health while underlining its role in the enhancement of biodiversity and air quality. Such initiatives will provide reactional spaces for residents, hence improving their quality of life and well-being (Li et al., 2024).

In summary, the planning strategies identified from the above studies include mixed-use developments, green infrastructure, biodiversity preservation, public transportation, community involvement, and education in the realm of sustainability. These strategies would reduce dependency on transportation systems and increase economic growth within a locality while minimizing carbon emissions to protect natural habitats. Economic disparity, along with economic interests, blocks such implementations of policies, and addressing them becomes significant in terms of achieving sustainable urban growth.

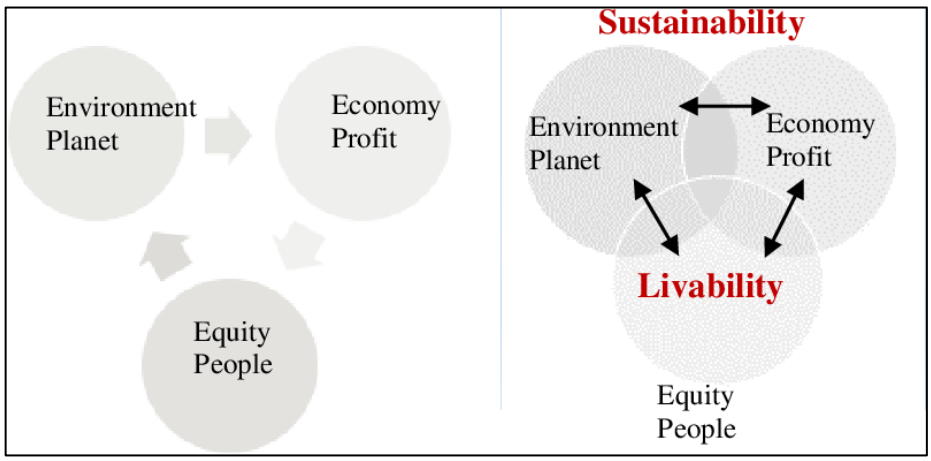
Relationship between Sustainable Urban Growth and Urban Livability

Rapid urbanization may further lead to inequality and traffic problems, for which strategic planning and policy intervention become necessary to strike a balance between sustainable urban growth and livability, even when urban livability is a key component of sustainable growth. The urban livability concept, regarding sustainable urban growth, encompasses various dimensions. It intertwines the several aspects of urban planning with social equity and environmental sustainability. Urban livability describes the quality of life of residents in urban settlements, which rests upon personal safety, social cohesion, ease of accessibility, and environmental

amenities. Besides the goals around human development, sustainability issues put forward a balance in focus and thus find a balance wherein meeting needs to be associated with the present does so without compromising the ability to subsequently satisfy the needs and requirements that naturally follow in generations to come. The relationship between sustainable urban growth and urban liveability is complex and interdependent; an integrated strategy advanced from these two standpoints demonstrates options that improve quality of life while enhancing environmental sustainability for conditions supporting life. The studies indicate that social urban sustainability significantly predicts city livability. Whereas economic and environmental factors necessitate supportive regulatory frameworks to convert efforts into concrete efforts into concrete benefits for residents. Sustainability of the economy and environment has a beneficial impact on livability when backed by efficient regulatory bodies and structures that convert initiatives into substantial benefits for individuals (Antolín-López et al., 2024). A more livable environment is produced by policies that give priority to having access to high-quality education, healthcare, and public services. To maintain long-term livability, sustainable urban growth must combine environmental preservation with economic growth. (Mohapatra, 2022). The relationship between sustainability and livability is shown in (Figure 22) below.

Figure 22

Relationship between livability and Sustainability



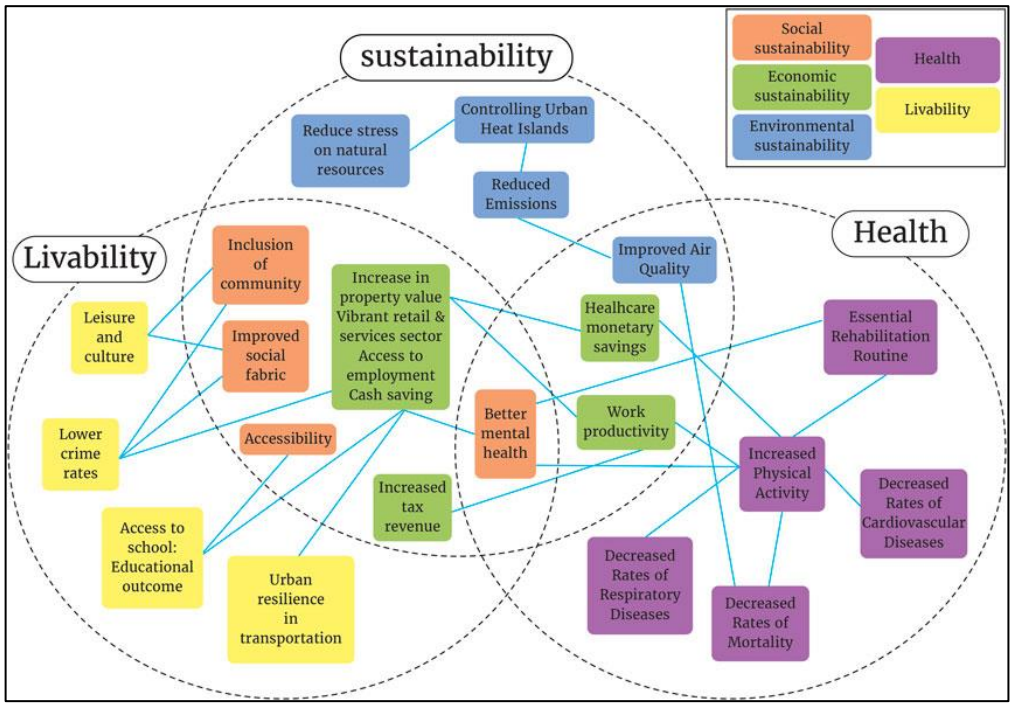
(Ahmed et al., 2019)

Additionally, to make cities more livable and encourage sustainable urban sprawl, infrastructure upgrades like green areas and public transportation are significant (Das et al., 2022). Another study states that improving livability requires good governance because it guarantees the fair distribution of resources and services. Livability in city areas is linked to sustainable urban growth and thus requires accessible community services, reduced reliance on private transport, and better neighbourhood design which donates to an improved quality of life for residents with reduced environmental impact in cities (Al-Thani et al., 2019).

Moreover, green space and environmental quality are considered key aspects in enhancing livability within cities. Previous studies proved that the availability of green spaces contributes to enhancing livability by providing environmental services and upgrading the physical well-being of inhabitants (Saeed et al., 2022). Another study reveals that the impacts of urbanization on environmental conditions, such as air quality and biodiversity, are some of the major drivers of livability. Rapid urban growth can lead to negative socio-economic and environmental changes, thus requiring good governance to reduce negative impacts on livability (Zhu et al., 2020). (Figure 23) shows the connection between sustainability, health, and livability.

Figure 23

Relationship between Sustainability and Livability



(Baobeid et al., 2021)

To summarize the above studies, the interrelation of urban livability and sustainable urban growth is defined based on economic, social, and environmental variables. Their integration into urban design and planning remains significant in building livable cities supportive of ever-growing populations. Urbanization thus faces challenges of balancing development with the preservation of livelihood, therefore making the areas resilient for all people.

Related Research

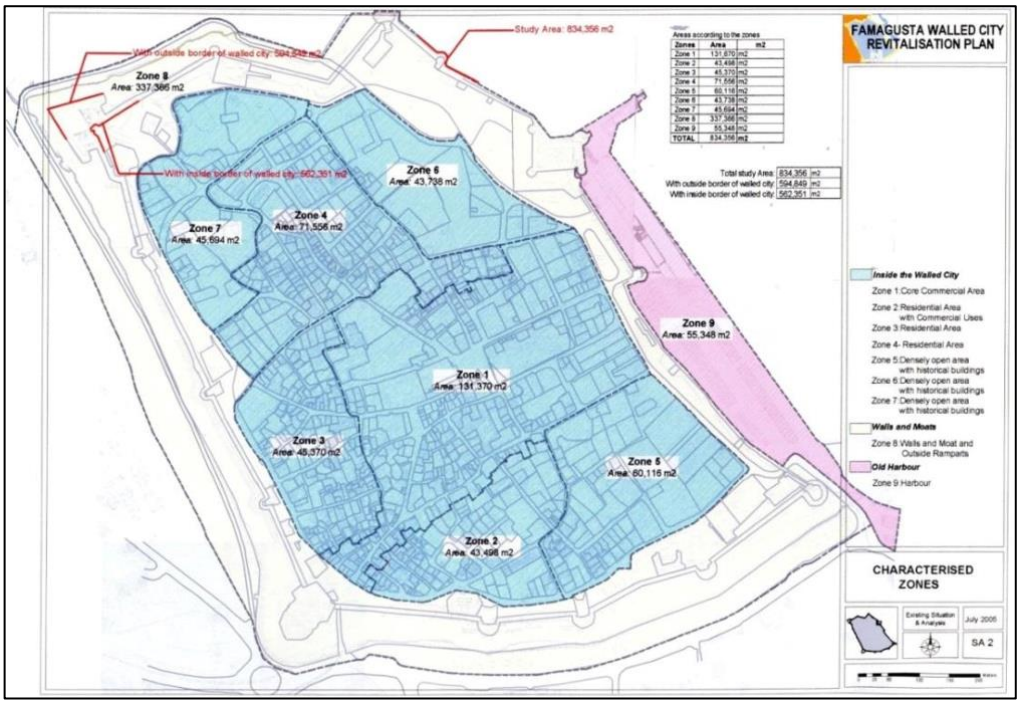
This section reviews studies on urban livability and sustainable urban growth, emphasizing their relevance to urban areas and historic urban areas. It explores methodologies for assessing livability, strategies for sustainable urban development, and the challenges of balancing modernization with heritage preservation in historic urban areas. The following related studies provide a foundation for understanding how these concepts apply to the walled city of Kano. Related studies are listed below in chronological order.

Mousavi, S. N. (2013) Livability in Historic Urban Quarters, Case Study: Walled City of Famagusta

Seyed Nima Mousavi's research thesis in 2013 titled "Livability in Historic Urban Quarters, Case Study of the Walled City of Famagusta" in Northern Cyprus investigated the Walled City's livability in Famagusta as a historic urban area. Generally, due to rapid urbanization, tourism has been an issue affecting the historic urban areas in terms of being lived in. Thus, the research paper aimed at creating a proper understanding of the present status of livelihood in the historic city and recommended ways for improvement. Among these are integrative factors that include population density, infrastructure, building conditions, and social dynamics. This case study was conducted through the analysis of individual character features and problems to obtain an insight into the sustainable urban development of the historic city. The walled City of Famagusta's map is shown in (Figure 24) below.

Figure 24

The Walled City of Famagusta



(Mousavi, 2013)

However, the research design adopted a mixed method approach using qualitative and quantitative methodologies in assessing the livability of the Walled City of Famagusta. Quantitative methods entail the collection of data on population

density, building conditions, and the quality of infrastructures among other relevant factors that would add to the evaluation of livability. It has involved qualitative methods of field observations, and interviews with residents, and other stakeholders to understand the social dynamics and challenges faced within the Walled City. The GIS tools help in the analysis of the spatial data, mapping out the key aspects of the urban area. A general view of livability challenges in the historic Walled City was collected through the adopted methods of collecting data. (Figure 25) shows the public space Namik Kemal Square in the Walled City of Famagusta.

Figure 25

Public Space (Namik Kemal Square)

(Mousavi, 2013)

Moreover, the research singled out the inadequate infrastructure, poor building conditions, and over-population as issues seriously affecting the livability of Famagusta Walled City. Meanwhile, the residents are concerned about the absence of parking facilities, playing areas, and green areas inside the historic urban quarter. The study also identified a gap within the research on sustainable city planning strategies in balance with modern standards for livability within the historic area. These recommendations ranged from the need to revive public spaces and improve infrastructure to engaging the people in making decisions that would enhance the

living standard in Famagusta, Walled City. (Figure 26) and (Figure 27) show the pedestrian pathways and the building condition of the Walled City of Famagusta.

Figure 26

The Pedestrian Pathways of the Walled City of Famagusta

(Mousavi, 2013)

Figure 27

Building Conditions of the Walled City of Famagusta

(Mousavi, 2013)

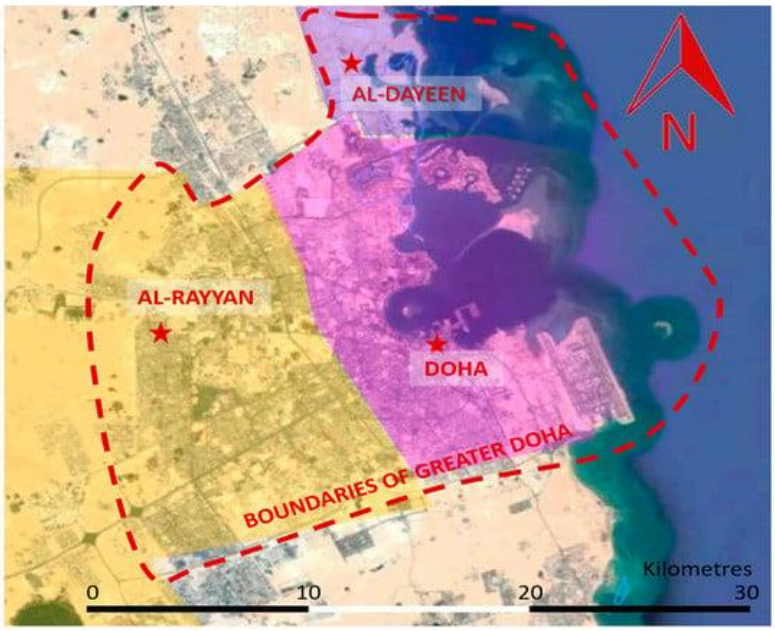
In summary, addressing overcrowding, building conditions, and infrastructural deficiency is relevant to improving livability inside the Walled City of Famagusta. Developing city strategies toward a balanced significance between efforts of preservation with the demands for modern standards of livability in historic urban quarters also becomes necessary.

Al-Thani et al. (2019) Urban Sustainability and Livability: An Analysis of Doha's Urban-Form and Possible Mitigation Strategies

The research paper written by Al-Thani et al. (2019) titled " Urban Sustainability and Livability: An Analysis of Doha’s Urban-Form and Possible Mitigation Strategies" defined the framework for analysing urban sustainability and livability in Doha, Qatar. Key points are summarized as follows. The introduction indicates that Doha is characterized as a city with low density, housing 80 % of Qatar's rapid growth, the city struggles with sustainability and is said to be ranked poorly in various international livability indices. The situation is critical as Qatar seeks to attain sustainability by its Qatar National Vision (QNV) 2030, supported by the National Development Strategies from 2012 and 2018. (Figures 28) shows the municipalities forming Doha.

Figure 28

The Municipalities Forming the Doha Area

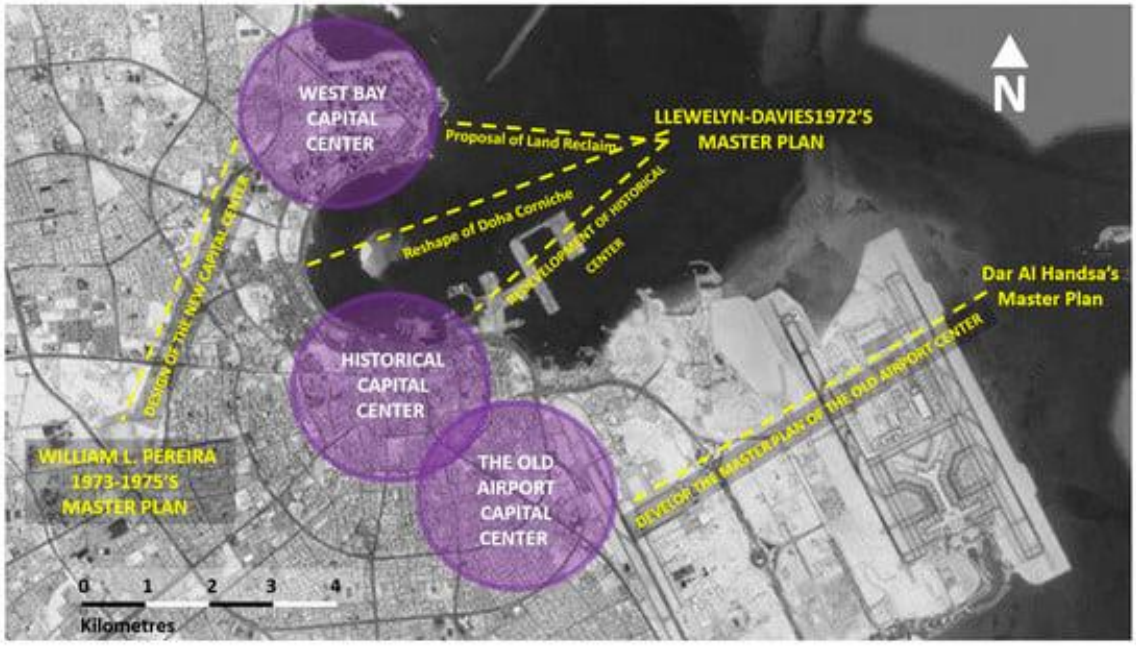


(Al-Thani et al., 2019)

Additionally, the urban challenges encountered in Doha, specifically urban sprawl result from significant reliance on private transportation. The absence of public transportation intensifies these problems, resulting in higher traffic congestion and environmental consequences, including the emission of CO_2 the urban form is defined by a predominance of single-family detached villas, resulting in restricted community services and amenities. Regarding the impacts on residents, the study highlights the adverse effects of the existing urban structure on residents, such as high vehicle dependency, prolonged commutes, and reduced quality family time. These factors influence multiple sustainability impacts environmental, economic, and social factors that influence the overall livability of the city. The main reason for this study is to assess residents' perspectives on neighbourhood enhancements and their readiness to modify transportation behaviours. This analysis aims to identify strategies for improving urban sustainability and livability in Doha, thereby benefiting both present and future generations. (Figure 29) shows the comprehensive plan of Doha.

Figure 29

Masterplan and Multiple Major Centres in Doha

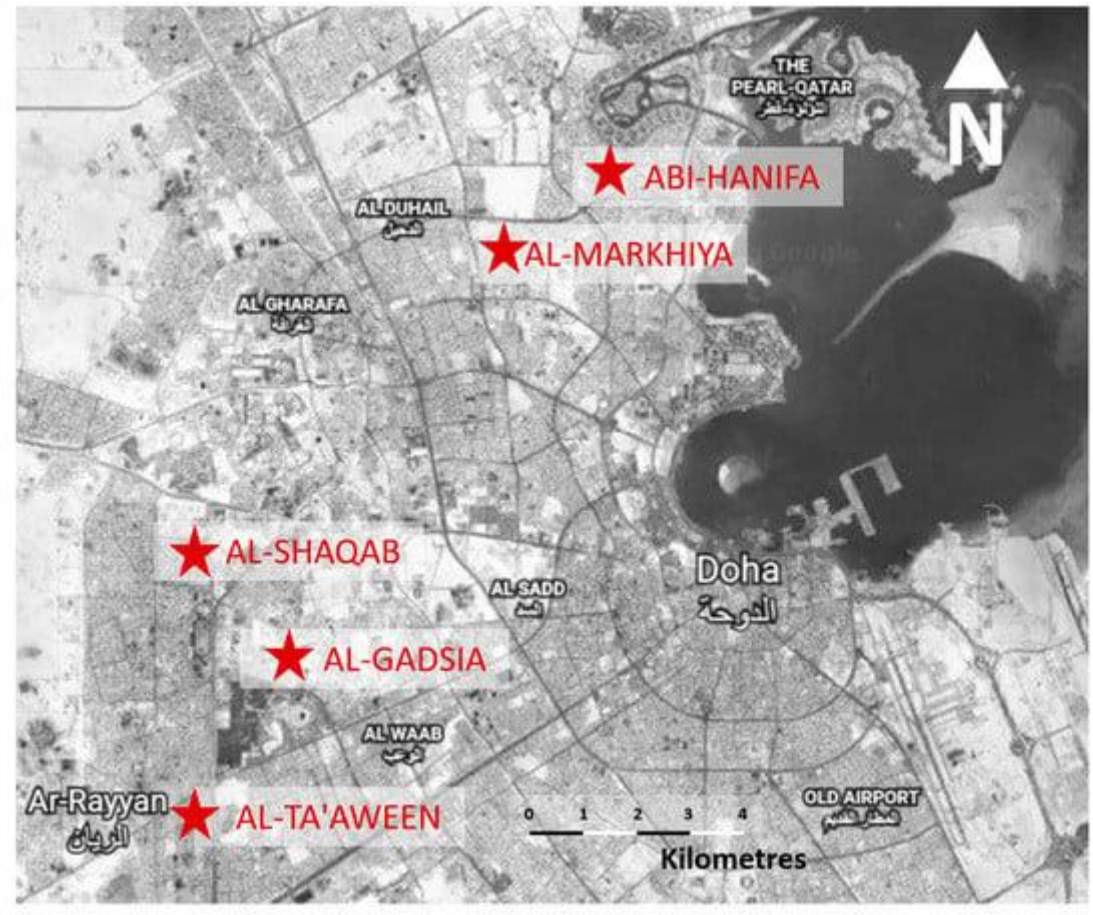


(Al-Thani et al., 2019)

However, the study analyses urban livability and sustainability in Doha using various methods. The survey was conducted amongst the residents using a behavioural questionnaire to understand the views of the residents on the neighbourhood and transportation habits. The study also evaluates the current urban form, focusing on its characteristics of low density and the impact of urban sprawl. Assessment of the modes of transportation that were dependent on a private vehicle to identify various challenges that contribute to the congestion of traffic and emission of CO2. It also assessed the sustainability indices and proposed mitigation strategies and received feedback from the residents regarding challenges. (Figure 30) shows the location of the survey.

Figure 30

Map Showing the Locations Where the Survey was Conducted



(Al-Thani et al., 2019)

The conclusion of the study created on the behavioural survey shows the views of the residents on the improvement of neighbourhoods and changes in transport mode use, and their compliance to modification of behaviour for the sake of present and forthcoming generations. The Qatar National Development Framework (QNDF) 2032 faces challenges caused by the fast growth and expansion of the city to be sustainable and livable. It develops an understanding of the social norms of the residents and further assesses the feasibility of promoting walkability and smart transportation in low-density residential neighbourhoods. The study also finds that walkability is often ruled out due to a lack of amenities, roads, and public spaces. The study also suggests that advancements in technology could help optimize mobility patterns and transform Doha into a sustainable city. The study suggests that economic class education. And professional backgrounds significantly influence attitudes and experiences.

Kovacs-Györi et al. (2019) Assessing and Representing Livability through the Analysis of Residential Preference

According to the research article written by Kovacs-Györi et al. in 2019 titled "Assessing and Representing Livability through the Analysis of Residential Preference" discussed how cities face many different sorts of global challenges, issues of increasing urban heat or natural disasters, air and noise pollution, poverty, segregation, gentrification, and overpopulation are all factors affecting the perceived 'livability' of the city, which relates to the aspect of person-environment association. Hence, viability may be an allowing concept and analytic tool for finding a better urban life. The UN-SDGs and NUA encouraged the improvement of the city's quality of life. However, most of the existing approaches to urban quality assessment lack integrated consideration of individual and environmental connections at various subject matters and dimensions. This study will present a conceptual and methodological approach toward developing livability in an urban setting. It sought to assist planners in more effectively advocating urban settings that improve quality of life while taking into consideration NUA and SDGs objectives.

The methodology states the questionnaire survey that was adopted and aims to gather the view of the residents in terms of livability in eight cities. There were about five main categories which include urban form, feeling of togetherness, public services, housing, and transportation. Survey questions are in four languages and,

unless otherwise stated, locals could answer except in Leon, Nicaragua, and some locations in Nairobi, Kenya. Selection criteria were based on the subjective livability concept. (Figures 31) and (Figure 32) show the different case areas and workflow of Methodology.

Figure 31

Population and Responses from the Six Case Areas

Table 1. Population (rounded) and number of responses for each study area.

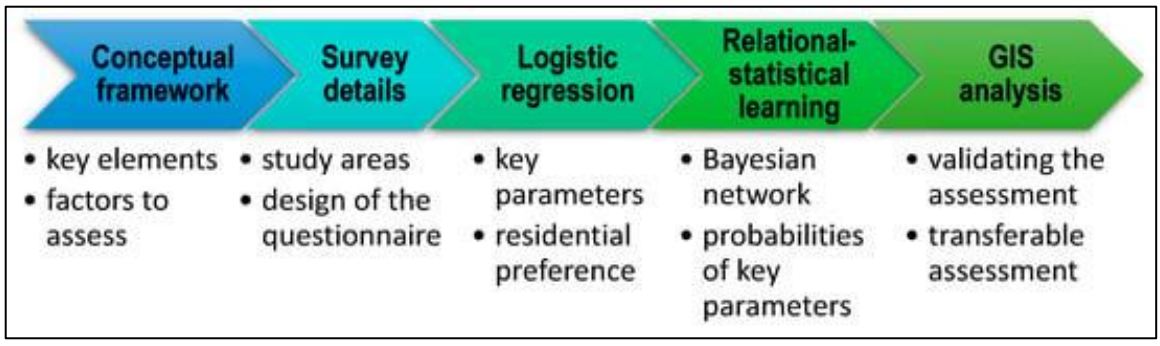
Country	City	Population		Number of Responses *
Nicaragua	León	168,000 [47]	32 *	131 responses from developing countries
Kenya	Nairobi	5,970,000 [48]	46 *	
Ecuador	Quito	2,700,000 [49]	53	
Austria	Vienna	1,900,000 [50]	91	309 responses from developed countries
	Salzburg	154,000 [50]	51	
United States	Portland, OR	653,000 [51]	43	
Hungary	Budapest	1,800,000 [52]	69	
	Szeged	161,000 [52]	55	

* In Nicaragua and Kenya, where paper-based questionnaires were used, not every question may have been completely answered.

(Kovacs-Györi et al., 2019)

Figure 32

The Methodology Workflow



(Kovacs-Györi et al., 2019)

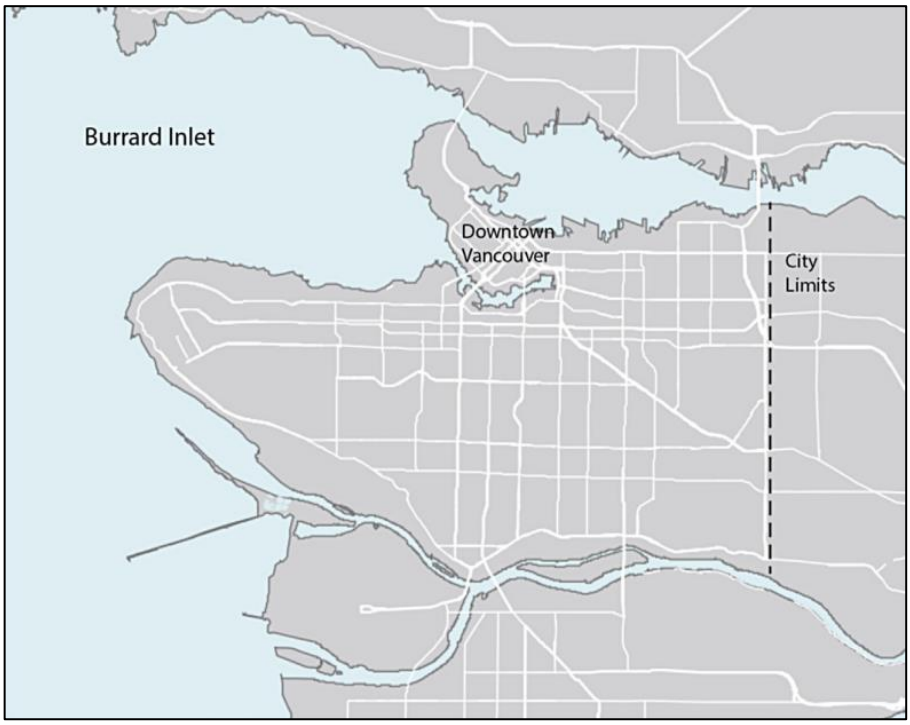
In this scenario, the research work deals with the intricacy of livability assessment by focusing on the key elements and their evaluation. It found that mobility-related and urban form factors are strongly linked with high urban livability, while development, housing conditions, and salary determine satisfaction. GIS analysis was used to model livability based on street furniture and trees. Though residential preferences are related to advanced areas, urban life satisfaction differs especially in developing areas. The study suggests using livability assessment in planning to diagnose cities and improve urban quality improvement.

Macdonald, E. (2020) Urban Design for Sustainable and Livable Communities: A Case Study of Vancouver

The research article of Macdonald (2020) titled " Urban Design for Sustainable and Livable Communities: A Case Study of Vancouver". This paper examined some urban design-sensitive planning strategies for livability and sustainability in Vancouver, British Columbia. The study focused on developing neighbourhoods that are livable and sustainable. The complexity of the process and evaluation of planning strategies over time has resulted in protests within the neighbourhood. It discusses two relevant planning periods in Vancouver: the period of Living First, which ranged from the mid-1990s to the mid-2000s and was followed by the Eco Density era. This research aims to distil information from the experience of Vancouver in balancing green urbanization objectives alongside the ambition for a better neighbourhood. It requires the cooperation of developers with planners as well as politicians together with all the members of the community while elaborating context-sensitive solutions. The approaches of planning that are followed in Vancouver and followed design control mechanisms have placed ample significance on context-sensitive urban design relating to both sustainability as well as liveability in urban environments. (Figure 33) shows the map of the city of Vancouver.

Figure 33

The City of Vancouver Map in British Colombia



(Macdonald, 2020)

Accordingly, the methodology adopted in this study was contextual analysis, comparative evaluation, and participatory planning methods to assess the application of living First and Eco Density planning strategies. The paper outlines the significance of community engagement in urban planning and design to reflect local values and needs. Vancouver as a case study highlights the complexities involved in considering context-sensitive urban design within urban planning policies. Then, the historical review of urban design practices in Vancouver, explaining the shift from the City Plan process to the Eco Density approach, describes transitions in planning priorities and their implications for community growth. Interviews with city staff gave information into the evolution of urban design analysis and planning goals over time. Policy analysis evaluates the impact of items community amenity contributions and development cost levies on urban development and the fulfilment of community requirements. These methods provide a thorough understanding of urban design in Vancouver and present ideas for other cities to achieve sustainability and livability in their communities. (Figure 34) shows the redesigned boulevard of the city of Vancouver.

Figure 34

The Redesigned Boulevard

(Macdonald, 2020)

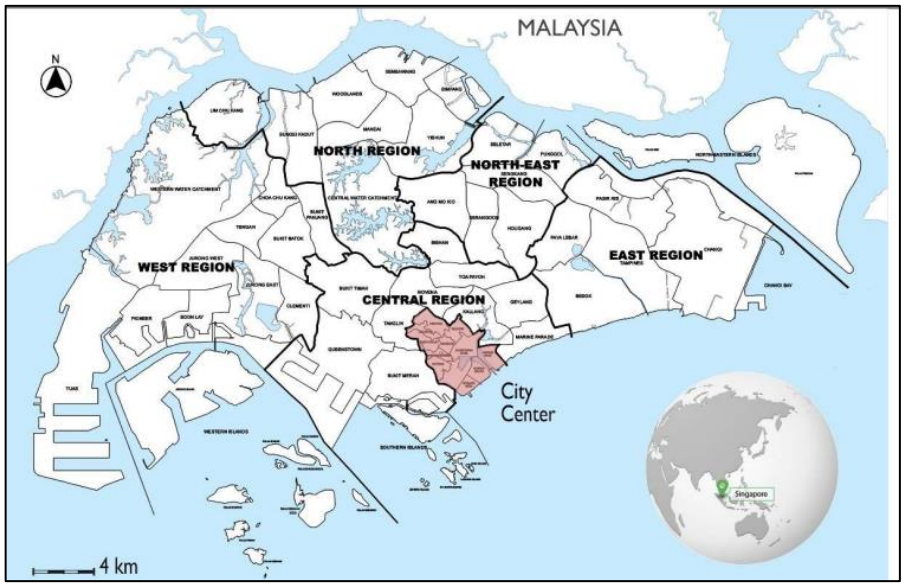
In conclusion, The Vancouver experience reflects the significance of context-sensitive urban design in fostering sustainable communities in North America. To support sustainable cities and regions, it requires resilient public transportation systems, diverse land uses, accessible housing, and compact urban areas. Local amenities and services would thus be necessary to support those higher densities and mixed uses in already lower-density, residential neighbourhoods. Compatibility issues with the goals related to sustainability should be carefully applied to land management and regional and citywide transportation policies. In the North American context, high-density housing requires careful consideration of the specific context in which it will be developed. Political decision-makers must differentiate between suitable densification strategies for urban centres and peripheral neighbourhoods while addressing external factors that disrupt local development markets.

Magdy, K., & Mohamed, S. (2022) Livable City Centre: Livability through The Lens of The Singaporean Experience: Case of Singapore City Centre

Magdy & Mohamed (2022) In their research article titled " Liveable City Centre: Livability through The Lens of The Singaporean Experience: Case Study of Singapore City Centre" reviewed the scientific literature on the perception of Urban Livability and its various dimensions. The present research seeks to analyse a study area in the city centre of Singapore and draw practical lessons from the case study. Equitable housing, safe localities, various transportation choices, and economic competitiveness are some of the policies on which liveable cities are built. Singapore follows a National Strategy of Sustainable Development for urban transformation concerning making a sustainable and livable environment. Thus, city-centre development will focus more on reinforcing the very social cohesion, equity, and well-connected urban public space. Indeed, its methodology and approach have made Singapore one of the most livable cities worldwide, reflecting value for its learning by others to imitate. (Figure 35) shows the Singapore map showing the city centre.

Figure 35

Singapore Map Showing the City Centre



(Magdy & Mohamed, 2022)

Likewise, the research identifies the concept and dimensions of Urban Livability through a literature review. It also undertakes a case study analysis of

Singapore to deduce lessons and insights from the country's experience. The research incorporates the National Strategy of Sustainable Development in Singapore within the urban transformation for liveability. The methodology involves investigating Singapore's development plan designed for the city centre by focusing on improving social cohesion, equity, and well-connected urban public space. Livable cities are founded on policies supporting fair housing, safe neighbourhoods, transportation options, and economic competitiveness. Urban design features of Orchard Road in Singapore are shown in (Figure 36) below.

Figure 36

The Urban Design Features of Orchard Road Singapore

(Magdy & Mohamed, 2022)

Singapore's urban development strategy, aligned with the National Strategy of Sustainable Development, aims to create a sustainable and liveable environment. The city centre development plan in Singapore prioritizes social cohesion, equity, and well-connected urban public spaces, contributing to its global reputation as a highly livable city.

Evaluation of Related Research

Generally, analysing the livability of urban areas is significant for fostering sustainable urban growth, especially in areas experiencing rapid urbanization. This evaluation reviews the related studies examining methodologies, frameworks, and case studies related to livability in urban areas as explained in (Table 4).

Table 4

Analysis of Livability in Urban Areas for Sustainable Urban Growth

Research Topic	Case Area	Year	Aim of the Study	Methods Used
Livability in Historic Urban Quarters: The Walled City of Famagusta	Famagusta Walled City	2013	The current state of livability in the Famagusta Walled City is identified and propose strategies for improvement.	The research employed a mixed-method approach. Using field observations, interviews, and Geographic Information Systems (GIS).
Urban Sustainability and Livability: An Analysis of Doha's Urban-form and Possible Mitigation Strategies	Doha, Qatar	2019	The research aims to evaluate the perception of Doha residents in residential areas their perception regarding the neighbourhood as well as their willingness to adapt to the evolving norms of car ownership and mobility patterns.	The study adopted a quantitative method using a questionnaire survey.
Assessing and Representing Livability through the Analysis of Residential Preference	Nicaragua, Kenya, Ecuador, Austria, United States and Hungary	2019	To provide a flexible conceptual framework in evaluating the standard of cities based on person-environment relationships.	The study utilizes reviewed theories, questionnaires, linear models, social numerical understanding, and GIS analysis.

Table 4 Continued

Urban design for sustainable and livable communities: Case study of Vancouver	Vancouver, British Columbia	2020	The study aims to enhance urban environments, promote social equity, and ensure environmentally sustainable development.	Key aspects of the methodology include Historical Analysis, Comparative Analysis, and Case Study Focus.
Liveable City Centre: Livability Through the Lens of Singapore Experience	City Centre, Singapore	2022	To analyse a case study of Singapore and also to draw practical lessons.	The study utilizes a literature review analysis, and case study observation.

(U. W. Mahmood, 2024)

Evaluation of related studies on livability and sustainable urban growth revealed gaps specific to the context of the Walled city of Kano. This research offered valuable insights emphasizing the cultural, geographical, and urban environments that are different from the Walled City of Kano, but do not consider the unique socio-cultural, economic, and environmental conditions of the city. The identified gaps revealed the need for specific research to address these challenges. There is a lack of studies in Africa that are related to livability in urban areas, which indicates the need for a comprehensive understanding of how diverse urban areas influence global livability and strategies for sustainable urban growth.

CHAPTER III
Methodology

This chapter further elaborates on the research design, participant/population and sample, data collection tool/materials, data analysis procedure, and data analysis plan. A mixed-method approach is used in analysing the study area: livability of Kano's Walled City. This research is specifically designed to give a complete understanding of the factors of urban livability and the strategies that should be proposed for attaining sustainable urban growth within Kano Walled City. To achieve this research goal, several studies will be conducted and explained.

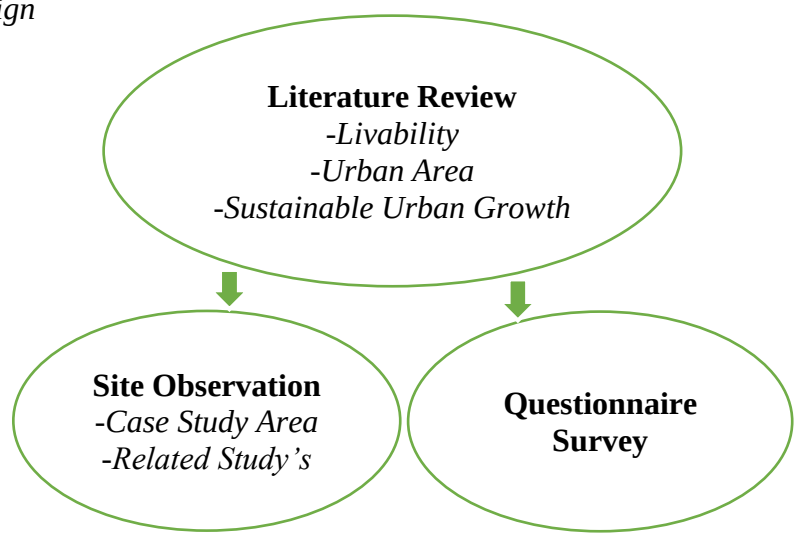
Research Design

The discussion of the research that would be undertaken in pursuit of meeting the objectives of the study in analysing livability towards sustainable growth in the Walled City of Kano uses both quantitative and qualitative approaches. Data are collected through a combined approach of literature review, site observation, and questionnaire survey, which is discussed below. The literature review represents the core foundation for the existing research, both in terms of some theoretical framework and area of study context. It is, thus, existing study-related scholarly articles, books, reports, and other relevant publications on the topic of urban livability and urban sustainable growth. Site observation, following reviewed literature, involves the visual analysis and current condition in the area of study as well as an analysis of examples of the related studies found in the literature reviewed. The final method is the questionnaire survey conducted among the people of the Walled City to collect quantitative data evaluated from different livability aspects and sustainable urban growth.

In summary, the research design utilized a mixed method approach that integrates reviewed literature, site survey, and questionnaire survey. The data collected from the survey is analysed using statistical methods to identify the relationship among the livability parameters. The quantitative analysis complements the qualitative analysis from the review literature and site observations, thereby providing a comprehensive understanding of the urban livability of the Walled City of Kano for sustainable urban growth. (Figure 37) shows the outline of the research design.

Figure 37

Research Design



(U. W. Mahmood, 2024)

Participants/Population and Sample

To make sure the study findings are understood comprehensively. The research seeks to offer an in-depth analysis of the Walled City of Kano's livability for sustainable urban growth. The main participants are the residents and users of the Walled City, which are the study focus group. For these reasons, to collect data on the general information, the livability, and sustainable urban growth of the Walled City, a four-section questionnaire survey was designed that consisted of thirty-five questions. The selection method is based on a random sampling technique throughout the study time to achieve the research objectives. The survey collected a substantial number of 239 responses highlighting the importance of demographic information in understanding comprehensive research findings.

Data Collection Tools/Materials

This section discusses the data collection tools and materials utilized to gather data for the findings. For this study, tools that were used for the collection of data were site observations of the case study area to get information and visual photography of the physical environment, related research examples, and a questionnaire survey. The materials used are Google Forms to create the questionnaire survey and to distribute the questionnaires electronically. Google Maps is used for mapping the case study areas to get spatial information within the Walled City of Kano.

Data Analysis Procedures

The data analysis procedure comprises qualitative and quantitative techniques. Based on the descriptive nature of the collected qualitative data that was observed. The site observation and visual survey are analysed based on the indicators and observations from the researcher. The quantitative data collected from the questionnaire survey (see Appendix A page 163 for more details) is analysed numerically with livability parameters replies on a Likert scale of 1-5. The statistical replies are analysed using (SPSS) a computer program called Statistical Package for Social Sciences. The analysis is illustrated using tables, figures, charts, diagrams, photographs, and maps. (Table 5) below is a formal evaluation table for analysing the livability of urban areas for sustainable urban growth: the Walled City of Kano, structured based on livability parameters sourced from a combination of the studies of Hashemkhani et al. (2024), Maysa & Hamid (2020), and Leby & Hasim (2010) in the literature review chapter under the Livability Section.

Table 5

Evaluation Table for Case Study Area

Case Study Area: The Walled City of Kano			
Livability Parameters	**Assessment Criteria**	**Findings of the Case Study Area**	**Considerations for Sustainable Urban Growth**
Accessibility	Availability and ease of access to basic amenities such as healthcare, schooling, and public spaces for people with different age groups and abilities.		
Socio-Cultural Diversity	To assess the different range of commercial, cultural, and social activities that take place in the walled city.		
Walkability	Availability of pedestrian-friendly pathways and the proximity to amenities in the Walled City.		
Transportation	The availability of efficient transportation systems will be assessed.		
Sociability	To assess community engagements, cultural activities, and social interactions in the Walled City.		

Table 5 Continued	
Landscaping	Availability and quality of green areas, public parks, natural vegetation, and aesthetics.
Economic Vitality	To assess the level of commercial activities and how active and vibrant are the public spaces.
Safety and Security	To analyse the level of security such as crime rate and safety in public spaces and streets.
Well-being & Health	To assess the people's overall livability and quality of life within the Kano Walled City.
Infrastructure Management	To assess the quality and maintenance of public facilities.

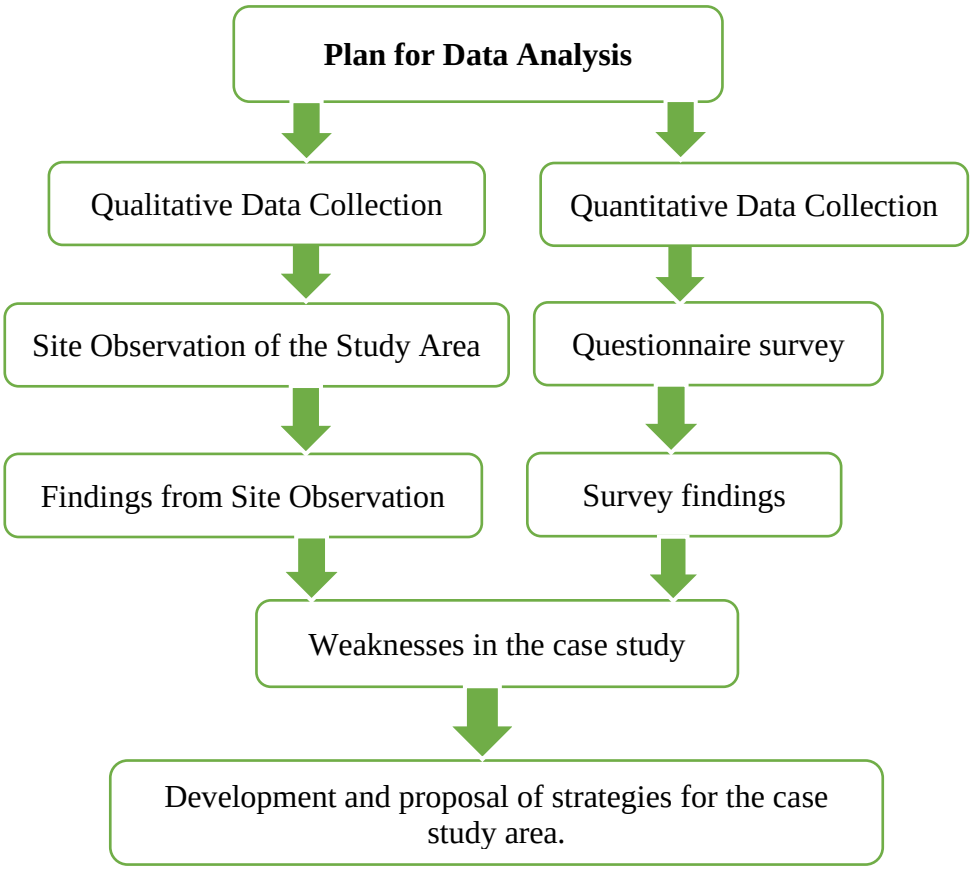
(U. W. Mahmood, 2024)

Data Analysis Plan

The study is based on analyses of urban livability to attain sustainable urban growth within Kano Walled City. About the study title, the research is geared toward accomplishing the objectives "to identify the factors influencing livability in the Walled City and propose strategies for sustainable urban growth." Qualitative data from the study was collected through a literature review, related study examples, and site observation throughout the study period. Quantitative data was gathered from September to October 2024 using questionnaire surveys for 6 weeks. Spatial data was examined using Google Maps to map out the case study region. The data findings undergo analysis using statistical representations and multiple factors evaluation to provide valuable strategies for sustainable urban growth. However, this data analysis plan as shown in (figure 38) below plan can help in ensuring comprehensive information on livability, ensuring a strong, evidence-driven framework for comprehending and strategizing sustainable urban growth within the walled city of Kano.

Figure 38

Methodology of Data Analysis Plan



(U. W. Mahmood, 2024)

CHAPTER IV

The Livability of the Walled City of Kano for Sustainable Urban Growth

This chapter discusses data collected through the study. It presents a transparent evaluation of the collected data from the qualitative methods of collecting data such as site observation and previous studies on the Walled City of Kano. Quantitative methods such as the questionnaire survey were administered to 239 users of the walled city of Kano. The findings from the study are discussed in detail using maps, photographs, bar charts, and tables which provide qualitative data through the site observations and quantitative data through the questionnaire survey.

Qualitative Data from Site Observation and Previous Studies

The following are the observations from the qualitative data collected from the study analysing the livability of the Walled City of Kano for sustainable urban growth. This section documents the physical characteristics of the Walled City of Kano.

Kano State, Nigeria

Kano State is located in the northwestern part of Nigeria, within the West African region. Geographically, it is situated between latitudes 11^{o}30'N and 13^{o}45'N, and longitude 7^{o}45' E and 10^{o}30'E. Kano metropolis is the capital of Kano State, Nigeria. Kano is said to be one of the ancient states in Nigeria it is called in the Hausa language *Jihar Kano*, in which it serves as the historic kingdom and traditional emirate. Also, it is the most urbanized urban centre and largest industrial and commercial centre in the northern part of Nigeria, with a population of over nine million citizens. Kano State is mostly inhabited by Hausa and Fulani people in which the dominant spoken language is Hausa and Fulfulde. (Figure 39) shows the (Google Maps, 2024 a) location of Kano State in Nigeria.

Figure 39

Highlighted is the Map Showing Kano State, Nigeria

(Google Maps, 2024 a)

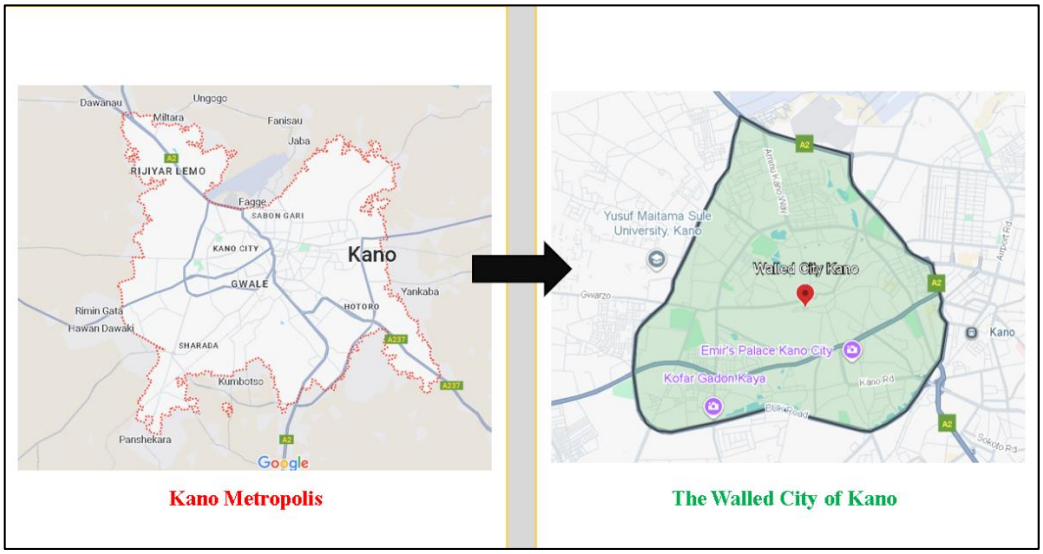
The Walled City of Kano

The walled city of Kano, founded in the 10th century, represents a significant example of traditional urban planning in Sub-Saharan Africa. Enclosed by ancient walls, the city has retained much of its historical layout, including narrow streets, courtyards, and markets, which have supported vibrant social and economic activities. The Walled City of Kano covers three local government areas known as Gwale, Dala, and Kano Municipal LGAs. The locations include landmarks like the Dala Hills, Kurmi, Market, and Emir's Palace. (Figure 40a) is (Google Maps, 2024 b) which shows the map of Kano metropolis, (Figure 40b) shows the map of the Walled City of Kano, (Figure 41) shows the narrow streets, (Figure 42a) shows the informal business activities by the roadside, (Figure 42b) shows the informal business activities under the bridge, and also (Figure 43) shows the major pedestrian pathway of the walled city of Kano.

Figure 40

(a) Map Showing Kano Metropolis

(b) Map Showing the Walled City of Kano



(a) (b)

(Google Maps, 2024 b; edited by U. W. Mahmood, 2024)

Figure 41

Narrow Street in the Walled City of Kano

(U. W. Mahmood, 2024)

Figure 42

a. Informal business activities by the roadside

b. Informal business activities under the bridge in the Walled City

(a) (b)

(U. W. Mahmood, 2024)

Figure 43

Pedestrian Walkway in the Walled City of Kano

(U. W. Mahmood, 2024)

Studies revealed that the city walls, known as Badalar Kano, have faced severe degradation due to human activities and natural factors, necessitating urgent conservation efforts. The Walled City is a testament to Indigenous architectural practices, highlighting defence mechanisms and cultural traditions. The wall's historical context is important for understanding the socio-cultural dynamics of Kano, a city that has retained its traditional layout despite colonial influences (Mohammed, 2018). Architecturally, The Walled City is characterized by traditional mud buildings with courtyard layouts, city gates that controlled access, and prominent structures such as the Kano Central Mosque and the emir's palace. These elements reflect the city's rich cultural and historical heritage. Historically, Kano thrived through trade, in textiles, leather, and agriculture, while also serving as a hub for Islamic learning. One of the access gates of the Walled City is known as Sabuwar Kofar as shown in (Figure 44).

Figure 44

The Walled City Gate known as Sabuwar Kofar

(History of Kano State, 2022)

According to previous studies and site observation concerning this study, today, the walled City of Kano faces several challenges, including population pressure, environmental degradation due to urban sprawl, and the need for better heritage preservation. While these challenges strain infrastructure and social services, the city also presents opportunities for sustainable urban growth through its

compact urban form, cultural tourism potential, and strong community networks. The balance between modernization and cultural identity remains a key concern for the next generation of the Walled City. (Figure 45), (Figure 46), (Figure 47), and (Figure 48) show the livability challenges faced in the Walled City of Kano.

Figure 45

Flooding in the Walled City of Kano leading to Environmental Degradation

(Useni, 2015)

Figure 46

Overcrowding and Traffic Congestion as a Result of High Population Density

(Auwalu Faisal Koko et al., 2023)

Figure 47

Deterioration of Infrastructure over the years due to Inadequate Funding and Negligence

(Abubakar, 2018)

Figure 48

Waste Products on the Road along the Kurmi Market

(Auwalu Faisal Koko et al., 2023)

In Summary, the Walled City of Kano represents a complex interplay of historical, cultural, and environmental factors that shape its urban morphology and livability. Gaining knowledge of these elements is essential for policymakers and

urban planners aiming to promote sustainable growth while preserving the city's unique heritage.

Quantitative Data from the Questionnaire Survey

Based on the quantitative data collected from the study, a four-section questionnaire survey was designed to collect data on general information, the Walled City of Kano, livability, and sustainable urban growth; see Appendix A page 183 for more details.

Section A: Demographic Information

Demographic information is the first and most important section of a survey questionnaire in research findings. In this study, it included gender, age range, and disability. The demographic information helps to accurately describe the study participants and make interpretations about the general information collected from the population being evaluated. It is encouraged that researchers should collect demographic data to ensure a quality study.

Gender

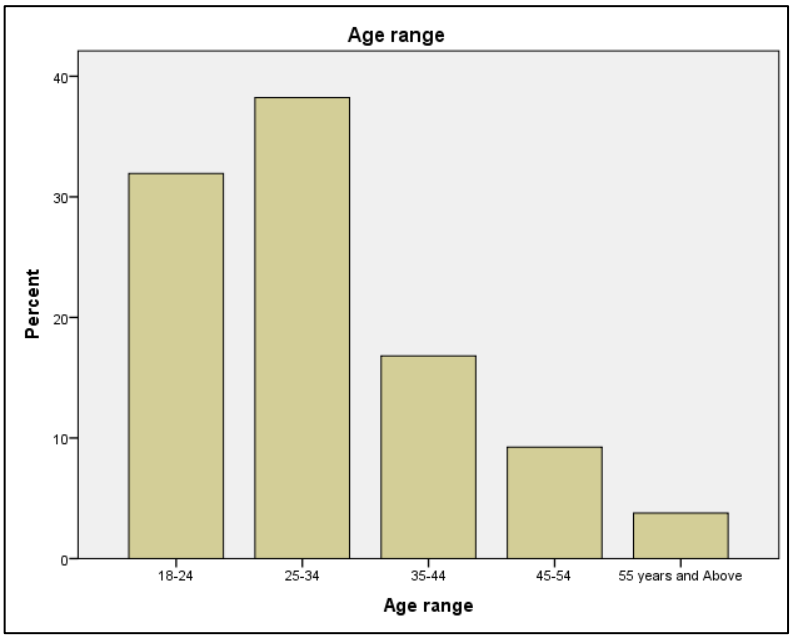
In the framework of this study, the analysis identified gender differences among participants, showing that 61.3% of responses are identified as male, 34.39% of responses are female, and 3.8% of responses prefer not to say their gender. The total number of responses that were obtained from the study was 239 responses. That is to say, a considerable number of respondents are male.

Age Range

The survey data shows a distribution of respondents across different age groups, The 18-24 age group has the second highest response accounting for 32.1% of respondents, and the age group 25-34 has the largest number of responses accounting for 38.4% of respondents, then followed by age group 35-44 has 16.5% respondents after that is the 45-54 age group which has 9.3% respondents, and lastly, age group 55years and above has 3.7% respondents. The majority of respondents are from the age group 18-24 years, highlighted that the survey was most engaging for younger individuals, with significantly fewer participants from the older age groups as shown in (Figure 49).

Figure 49

Age Range



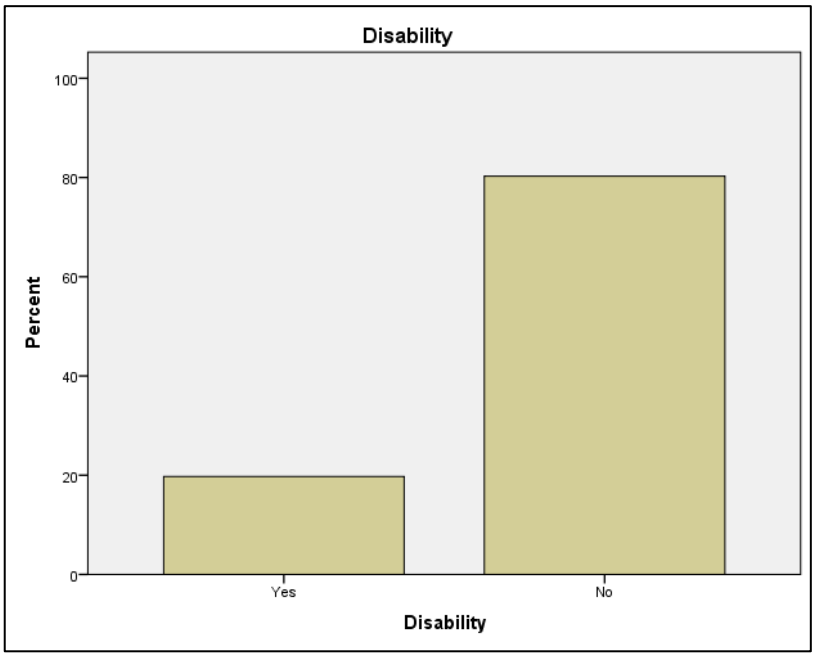
(U. W. Mahmood, 2024)

Disability

The disability data was collected from 239, which indicated that 80.7% of respondents do not have a disability, while 19.3% of respondents do have a disability. This data is interpreted based on the accessibility and inclusivity of individuals in the Walled City of Kano. The data shows that a small percentage of respondents 19.3% are identified as having a disability, which can inform urban designers and planners in making decisions for public spaces, policies, or interventions to ensure inclusivity and accessibility for all as shown in (figure 50).

Figure 50

Disability



(U. W. Mahmood, 2024)

Section B: Walled City of Kano

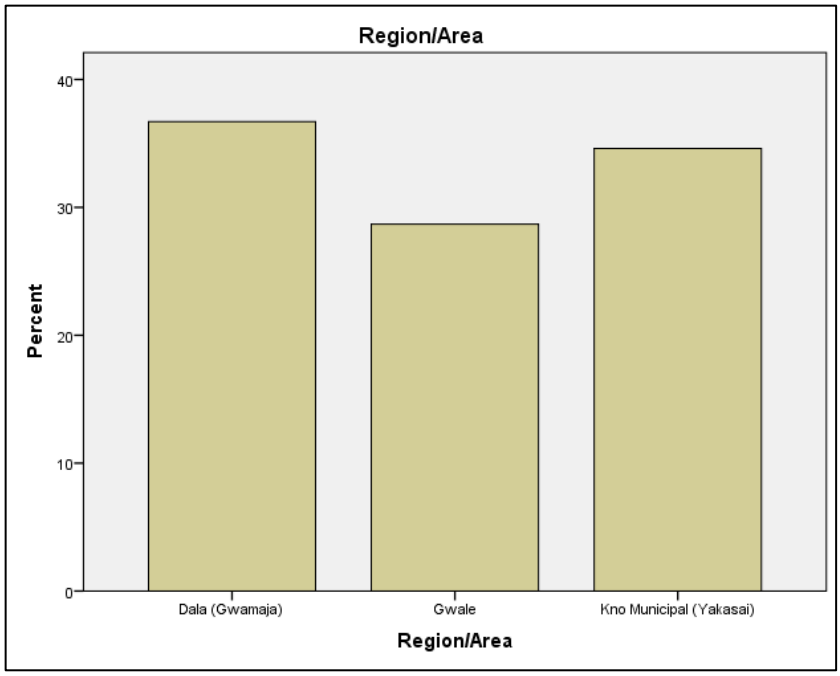
The second section of the questionnaire survey is questions under the Walled City of Kano which will provide an insight on urban livability, sustainability, and user experience. Under the sections questions are being asked which include current region respondents living in the Walled City of Kano, their reason for visiting the Walled City for the respondent who does not live in the Walled City, and lastly, the feeling of safety and security while walking through the streets. Understanding these factors can help identify challenges faced within the Walled City related to urbanization and help provide solutions. Many activities are being conducted within the Walled City which includes commercial activities, cultural or religious activities, social or recreational activities, and many more. Various transportation means are used within the walled city which reflects accessibility and urban planning effectiveness. Also, individual perception of safety and security directly impacts livability, with positive perceptions indicating effective security measures, proper lighting, and community engagement.

The Current Region Respondents Live in Kano Walled City of Kano

Data collected from this survey indicated that there is a significant population density in all the areas of Kano Walled City. Survey data revealed three local government areas (LGAs) within the Walled City of Kano as it was discussed earlier. Gwale 28.7%, Kano Municipal 33.5%, and Dala 37.8% respondents, respectively. Gwale, with 28.7 percent of respondents, is a moderately dense area with moderate challenges like access to basic amenities, congestion, and housing quality. Kano Municipal, which has 33.5 percent of respondents faces intense urban activity and may expose the residents to infrastructural challenges like overcrowding, pollution, and traffic congestion. Investments in sustainable urban growth solutions such as public transportation and waste management, can improve the livability and functionality of the people and visitors of the Walled City of Kano. Dala, with 37.85 percent of respondents, indicated its significant population density. This data presented offers a foundation for strategic intervention to enhance urban livability and sustainability within the Walled City as shown in (Figure 51).

Figure 51

The Current Region Respondents Live in the Walled City of Kano



(U. W. Mahmood, 2024)

Respondents' Reason for Visiting the Walled City of Kano.

The data collected on reasons for visiting the Walled City of Kano revealed a diverse set of reasons, highlighting the multifunctional nature of the urban area. Tourism is the most common reason for visiting, with (18.4%) of respondents visiting the Walled City for its rich cultural and historical heritage as discussed in previous studies. This indicated the city's role as a key destination for cultural tourism, drawing both local and international visitors as was discussed in the study. Enhancing infrastructure for tourism, such as signage, preservation of heritage sites, and guided tours, can boost the Walled City's identity as a cultural centre.

Also, Commercial visits make up a substantial portion of reasons for visiting with (24.4%) of respondents, showing the Walled City's role as a commercial centre as was also discussed in previous studies. Improving infrastructure, such as markets and trading areas, can make the Walled City more efficient and attractive for commercial activities. Addressing issues like congestion, waste management, and parking would help create a more friendly environment for commercial purposes.

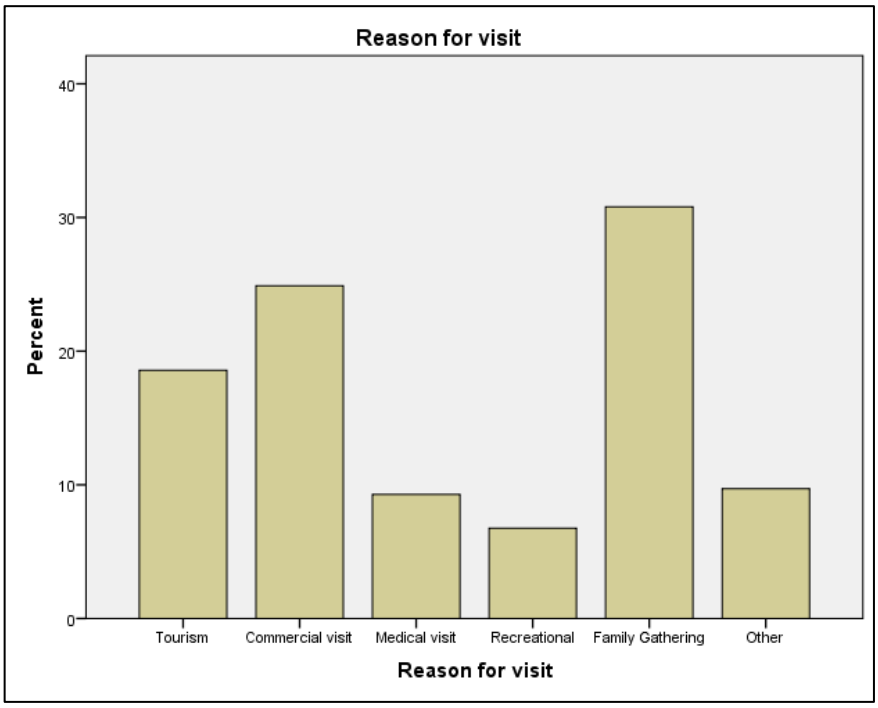
Medical visit is the least common reason for visiting the Walled City of Kano, with (9.4%) visiting the city for medical services. The presence of healthcare facilities suggested that the walled city plays a role in providing medical services to both residents and visitors. Policy implications included enhancing medical infrastructure, building more healthcare centres, and improving accessibility to existing hospitals within the walled city.

Recreational visits are another reason that makes up the smallest number of responses with (6.4%) of respondents. Suggesting limited opportunities for leisure activities in the Walled City based on the data collected. Developing public spaces for recreation, such as parks, will make the Walled City a more attractive area for both citizens and visitors.

Family gatherings are the most common reason for visiting the Walled City of Kano with the highest number of responses (31.4%) respondents. Highlighting its social and cultural significance. Improving communal spaces and ensuring safe, accessible areas for family gatherings can further enhance the city's social activities. However, the other reasons for visiting included living in the Walled City, educational visits, and people passing by the Walled City 10% of respondents. Improving public spaces for leisure should be considered a priority for the development of the Walled City of Kano as shown in (Figure 52) below.

Figure 52

Respondents' Reason for Visiting the Walled City of Kano



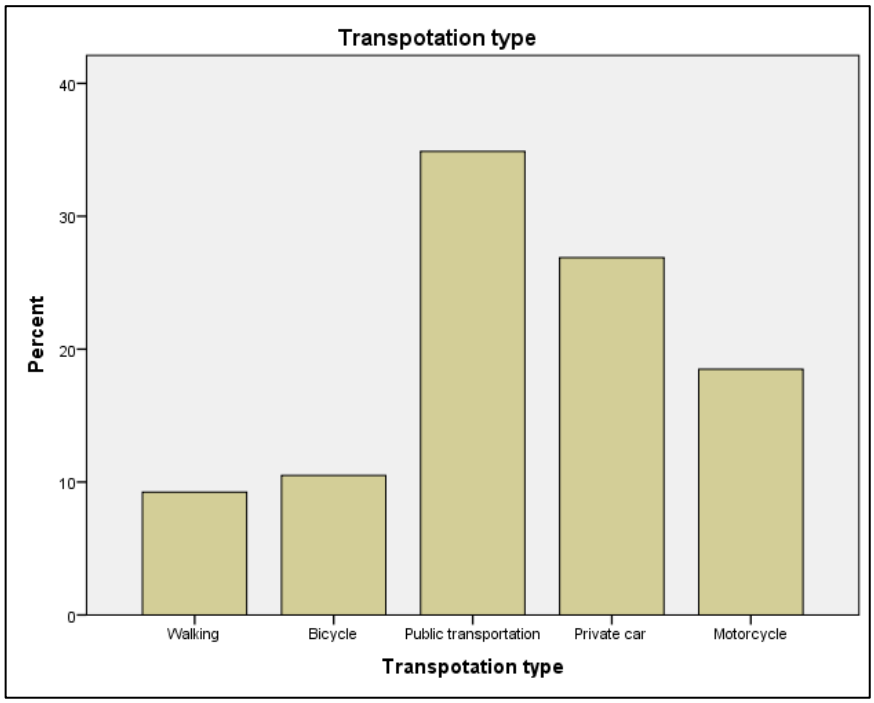
(U. W. Mahmood, 2024)

Transportation Type Used Within the Walled City of Kano

The survey indicated that 9.3 percent of participants use walking as a mode of transportation, 10.1 percent utilize bicycles, 35 percent use public transportation which has the highest number of respondents, 27 percent use private cars, and 18.6 percent utilize motorcycles. However, the transportation data analysis shows that despite public transportation being the most common method of transport used within the Walled City, a considerable percentage of the population depends on private cars and motorcycles, which could increase congestion and environmental pollution. Improving public transportation, enhancing facilities for walking and cycling, and regulating private car usage will be essential for achieving sustainability and improving the Kano Walled City's livability as shown in (Figure 53).

Figure 53

Transportation Type used in the Walled City of Kano



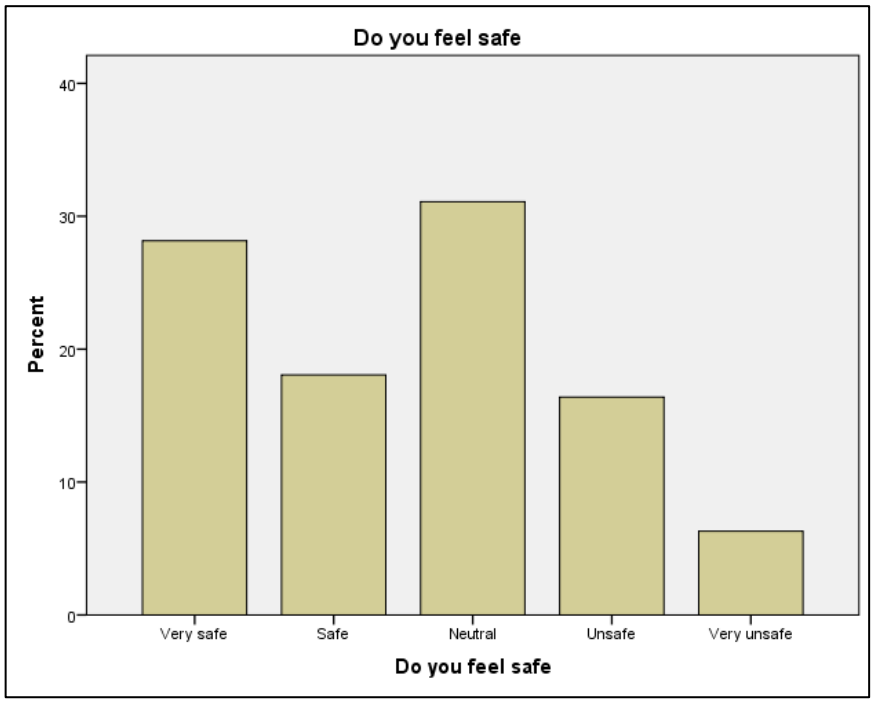
(U. W. Mahmood, 2024)

The feeling of Safety and Security while Walking through the Streets of the Walled City

Data collected from the survey regarding the individual feeling of safety and security while walking through the Walled City of Kano is analysed, the perception of the respondents indicated that 28.3 percent are feeling very safe, 18.2 percent feel safe, 30.8 percent feel neutral, 16.5 percent feeling unsafe and 6.2 percent feeling very safe. The majority of respondents feel the area is secure, with community guards, low crime rates, and safe public spaces contributing to this perception. According to previous studies concerns about specific locations or times of the day may lead to cautious behaviour. To improve the safety and security of the Walled City urban policies should be implemented focusing on promoting safety initiatives and enhancing the visibility of security measures as shown in (Figure 54).

Figure 54

The feeling of Safety and Security



(U. W. Mahmood, 2024)

Section C: Livability of the Walled City of Kano

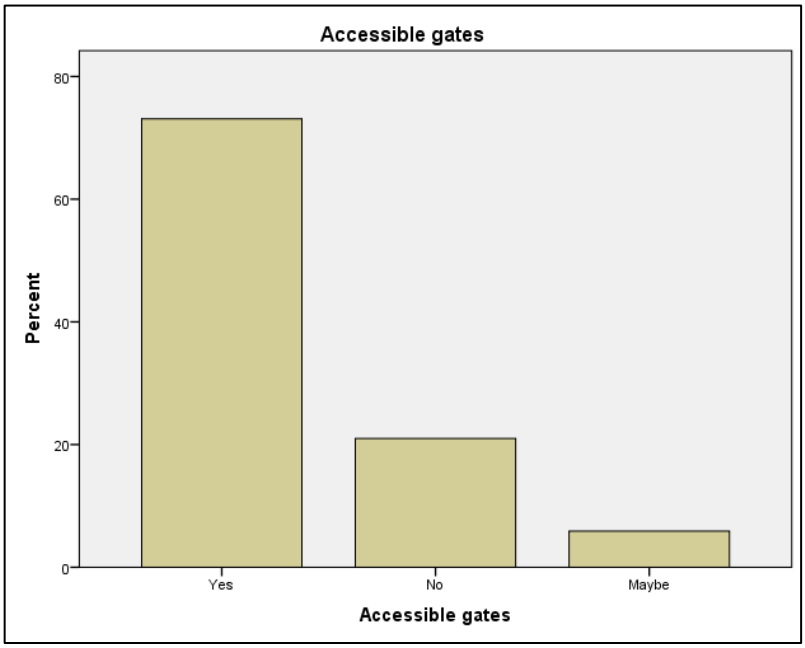
The following livability parameters from evaluation table 5 in the methodology chapter are the focus of this section of the questionnaire survey, which analyses the livability in the walled city of Kano. The primary focus of the analysis includes the following. Accessibility parameters include the challenges associated with accessing public buildings, historical gate accessibility, and infrastructure accessibility for disabled individuals, Transportation parameters analyse the accessibility and availability of public transportation. Lighting is a consideration for safety and security. Quality of life falls under the livability parameter of well-being and health. Infrastructure maintenance under the parameter infrastructure management. The affordability of basic amenities and commercial spaces is a key factor under the economic vitality parameter. The aesthetic appeal is considered under the landscaping parameter. The population density is for the walkability parameter and also social activities and public space availability are for the socio-cultural diversity parameter.

Accessibility of the Walled City Gates

The question asked in the questionnaire was are the entrances and gates to the ancient city walls of Kano easily accessible? The data that was collected from the respondents were based on yes, no, and maybe answers. 73.6 % of the participants said yes which indicates that the participants are satisfied with the accessibility and usability of the gates, 20.4% said no thus highlighting potential barriers such as poor maintenance or restricted access, and 6% of the participants responded with showing uncertainty from the participants. However, these findings highlighted the significance of maintaining and enhancing accessibility to make it easy for access for the people of the ancient city walls as shown in (Figure 55).

Figure 55

Accessibility of the Walled City Gates



(U. W. Mahmood, 2024)

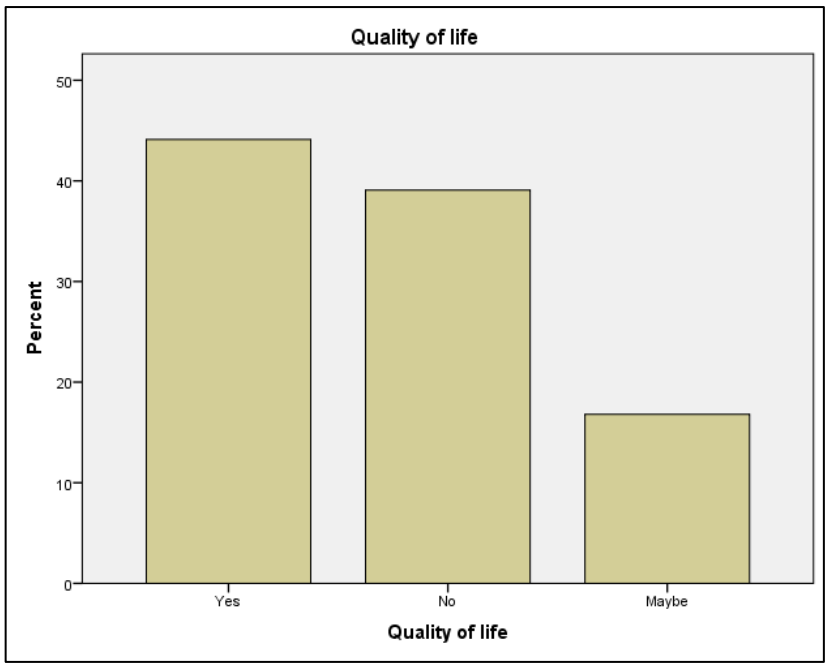
Quality of Life within the Walled City of Kano

Under the well-being and health livability parameter quality of life is an important part. Findings from the quality of life in the Walled City revealed a varied perception among the participants. 44.7% of participants considered the quality of life to be livable, however, a considerable number of 39.3% of participants indicated it is not livable indicating considerable difficulties. Furthermore, 16.0% of participants expressed uncertainty, reflecting diversity in their experiences. These

data findings highlighted the necessity for focused initiatives to mitigate issues and enhance overall livability for dwellers and visitors of the Walled City as shown in (Figure 56).

Figure 56

Quality of Life within the Walled City of Kano



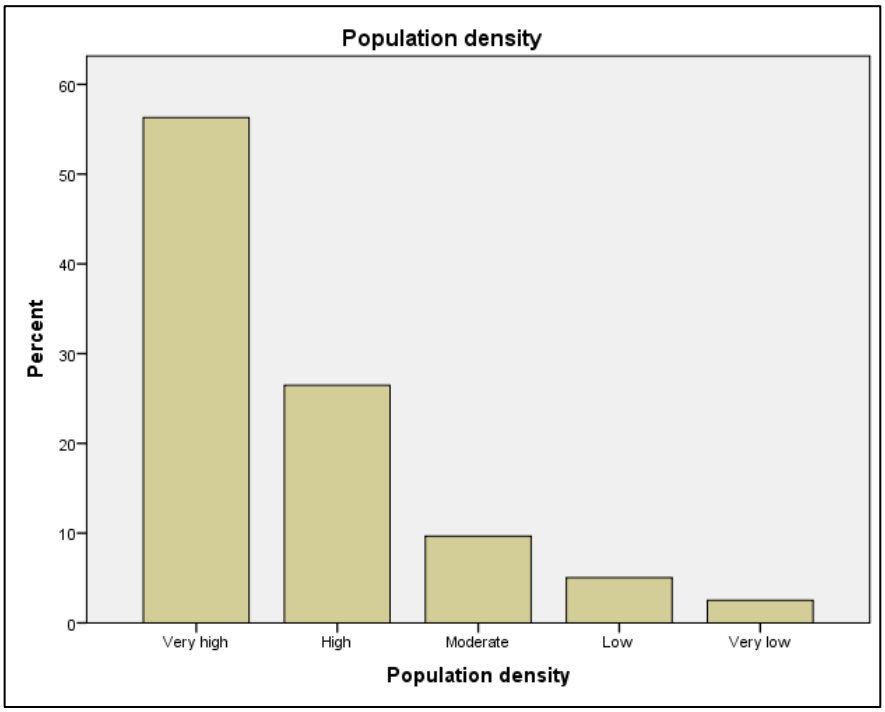
(U. W. Mahmood, 2024)

The Population Density of the Walled City of Kano

The Population density of data that was collected from the participants under the walkability parameter indicates that 57% of participants perceive it as very high which is relatively high, followed by 26% of participants who said it is high, a smaller number considered it moderate with 9.4% of participants, while 5.1% participant said it is low and 2.5% said very low which is evident that the responses are minimal. This indicated that the Walled City's population density is a principal issue, being a contributing factor to issues like overcrowding, reduced quality of life, and strain on infrastructure. Addressing these problems is significant for achieving a livable community and sustainable urban growth practices. See (Figure 57).

Figure 57

The Population Density of the Walled City of Kano



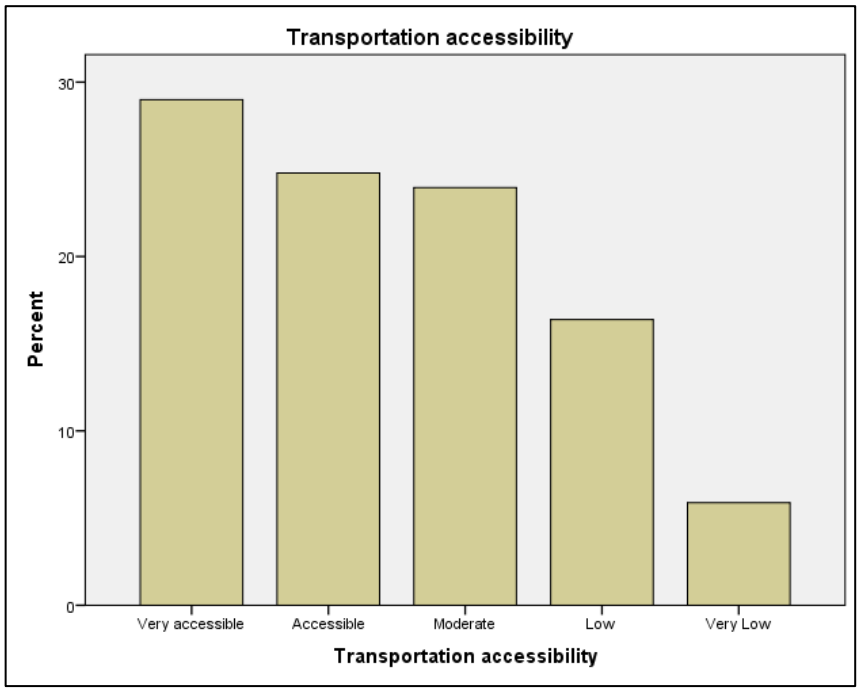
(U. W. Mahmood, 2024)

Respondents Ease of Access to Public Transportation Services

This question is intended to give an insight into how easily accessible the public transportation services are in the Walled City of Kano. However, 28.9% of the participants indicated that it is very accessible, 25% accessible, 24.2% moderate, 16% low, and 5.9% very low. It shows that public transportation services within the walled city are easily accessible except for some areas that are undergoing urban challenges. Considerable differences remain in reach and reliability, thereby demanding targeted improvements for inclusivity and efficiency as shown in (Figure 58).

Figure 58

Respondents' Ease of Access to Public Transportation Services



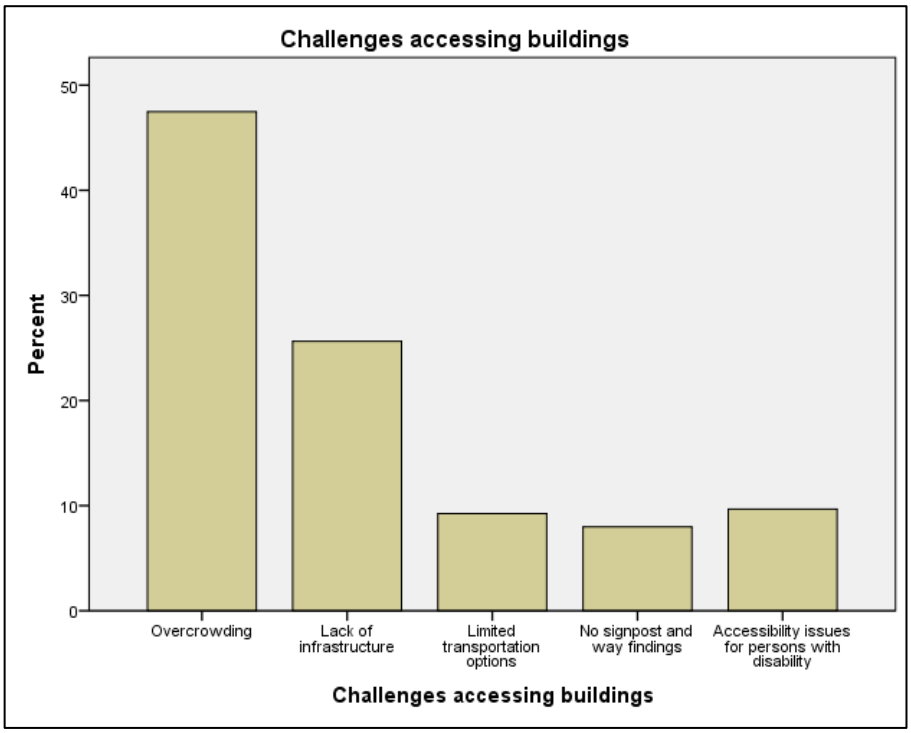
(U. W. Mahmood, 2024)

The Challenges Faced in Accessing Public Buildings in the Walled City of Kano

Responses to the question, what are the main challenges individuals face in accessing public buildings like hospitals, schools, banks, etc. within the Walled City of Kano? However, 47.3% faced overcrowding indicating high population density and capacity of facilities, thereby leading to long queues and reduced efficiency of the building, 25.7% lacked infrastructure showcasing deficiencies such as poorly maintained buildings, inadequate road networks, and insufficient amenities, 9.3% limited transportation option, 8% no signpost and way findings, and lastly 9.7% accessibility issues for persons with disability. Overcrowding is said to be the highest challenge faced, followed by lack of infrastructure. That is to say, proper urban planning consideration is needed for sustainability, urban functionality, and equality within the Walled City as shown in (Figure 59).

Figure 59

The Challenges Faced in Accessing Public Buildings



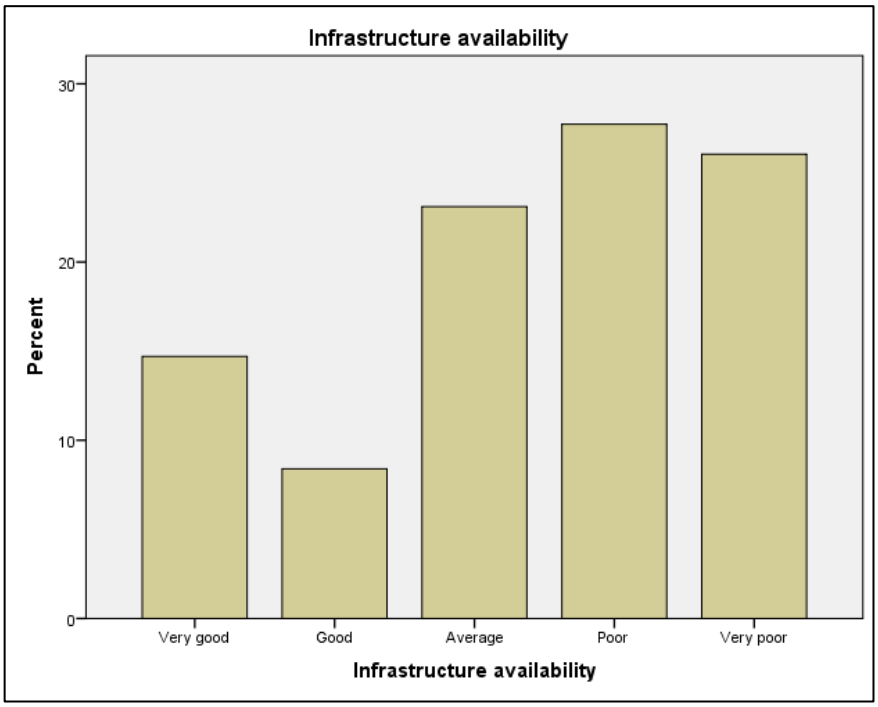
(U. W. Mahmood, 2024)

The Availability of Infrastructure and Accessible Pathways for the Disabled

The question directed to the participants is, how would you rate the availability of infrastructure such as ramps, elevators, and pathways for individuals with disability within the Walled City of Kano? However, 14% of participants responded with very good, 8.5 % responded with good, 23.5% said average, then 27.6% responded with poor and 26.4% responded with very poor. That is to say, the highest response was poor with 27.6% followed by very poor with 26.4% indicating that individuals with disability do not have the availability of infrastructure and accessible pathways. Considerations should be made when designing and planning urban areas for people with disabilities to make them sustainable and livable for the users and also encourage inclusive urban environments for all. See (Figure 60).

Figure 60

The Availability of Infrastructure and Accessible Pathways for the Disabled



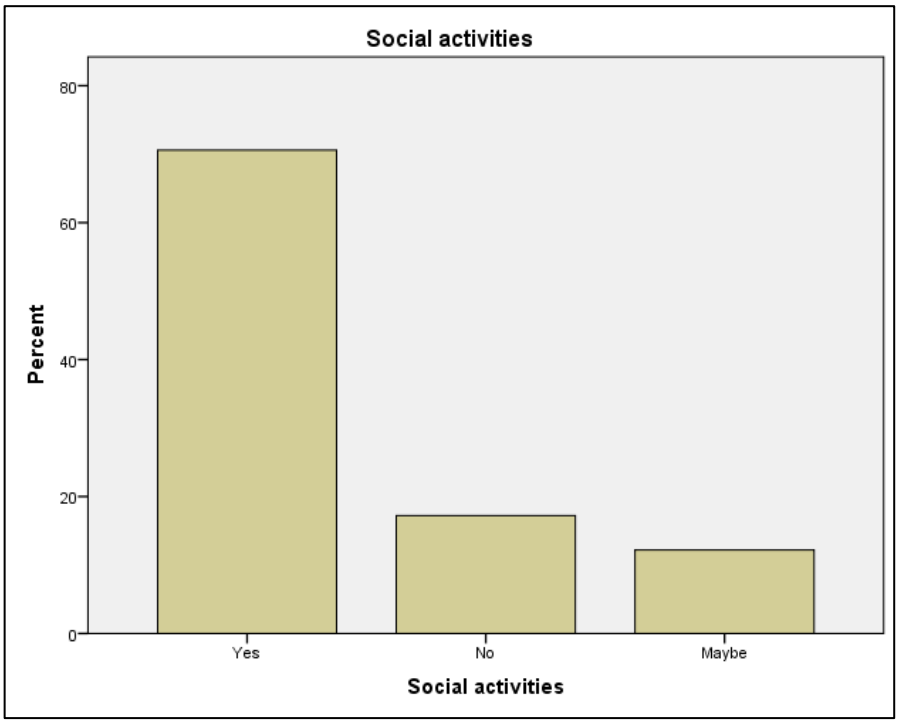
(U. W. Mahmood, 2024)

The Walled City of Kano Social Activities

The question directed to the participants was, are there enough social activities in the Walled City of Kano? 71.2% of the participants responded with 'Yes,' 16.5% responded with 'No' and 12.3% responded with 'Maybe.' The response to the above question shows a positive perception with 71.2% of participants affirming that there are enough social activities. This shows a vibrant social environment sustained by cultural events and gatherings. However, some participants felt there were insufficient activities, and some indicated uncertainty. That is to say, enhancing inclusivity and accessibility in social activities could address these issues and further enhance the Walled City's social activities as shown in (Figure 62).

Figure 61

The Walled City of Kano Social Activities



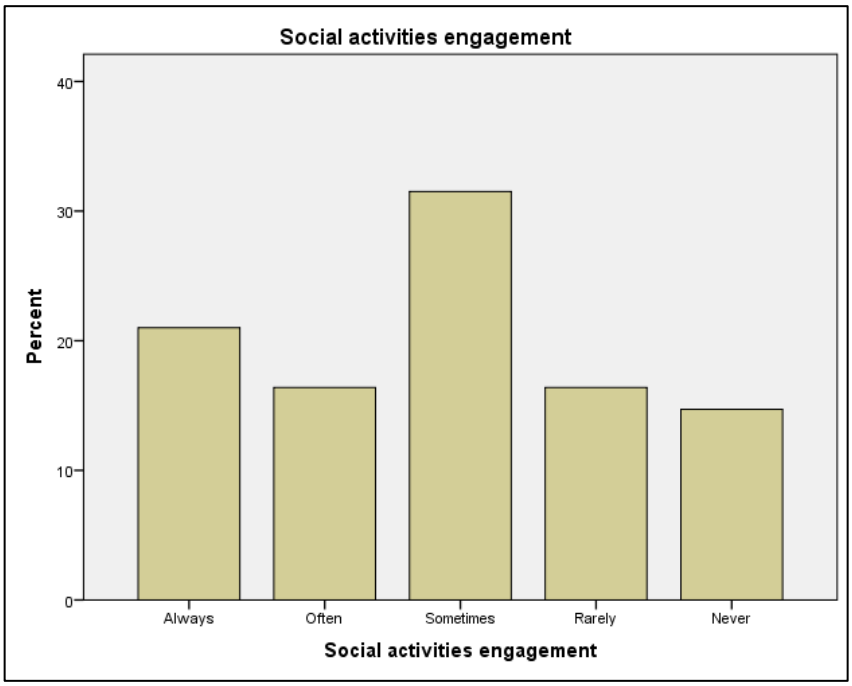
(U. W. Mahmood, 2024)

Social Activities Engagement

The survey indicated various levels of social activity engagement in the Walled City of Kano. Among the respondents, 21.0% participate in social activities regularly, 16.4% engage often, 31.5% sometimes participate in the activities, 16.4% rarely engage, and 14.7% never engage in any social activities. This shows that a considerable number of the population is less socially active, indicating that initiatives to enhance inclusivity and diversify activities may improve engagement in social activities within the city walls of Kano as shown in (Figure 62).

Figure 62

Social Activities Engagement



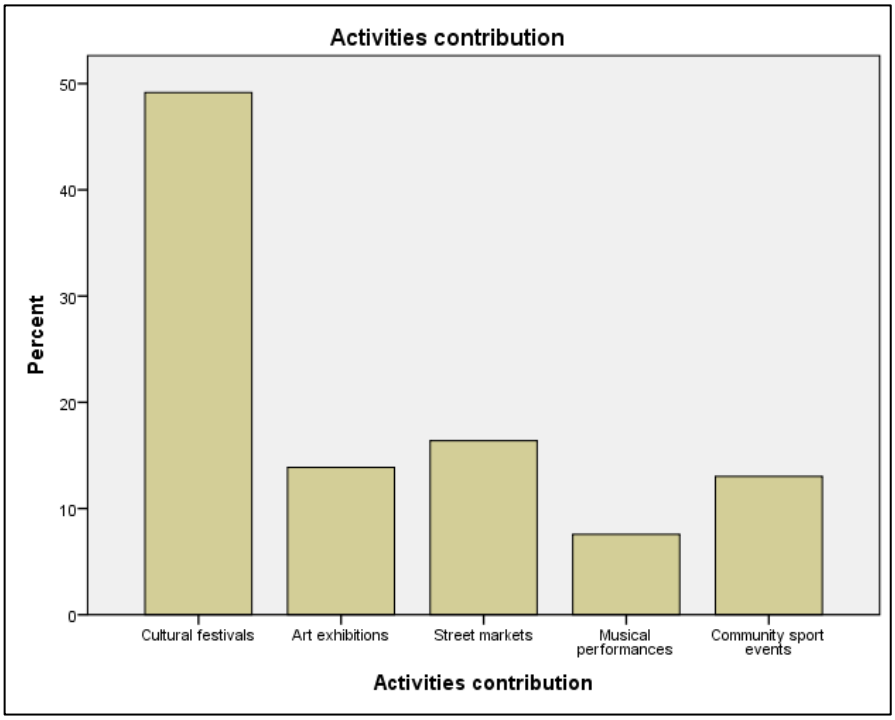
(U. W. Mahmood, 2024)

Activities or Events that Contribute to Enhancing the Vitality of the Walled City

The question that was directed at the participants was on the type of activities or events the participants think would add to enhancing Kano Walled Cit's vitality. The walled city's vitality can be enhanced through culturally and socially engaging events. Based on the responses 49.37% of the participants think cultural festivals can enhance vitality, 31.92% community sports events, 13.08% art exhibitions, 16.04% streets markets, and 7.59% musical performances. However, cultural festivals are identified by the respondents to be the most contributing event in the Walled City reflecting their role in preserving heritage, and community pride and attracting visitors while the less prioritized by the respondents is the musical performances which when prioritized can offer creative expression and entertainment that could diversify and improve the city's vitality. These activities and events can significantly boost engagement, tourism, and overall livability of the Walled City of Kano as shown in (Figure 63).

Figure 63

Activities or Events that Contribute to Enhancing the Vitality of the Walled City



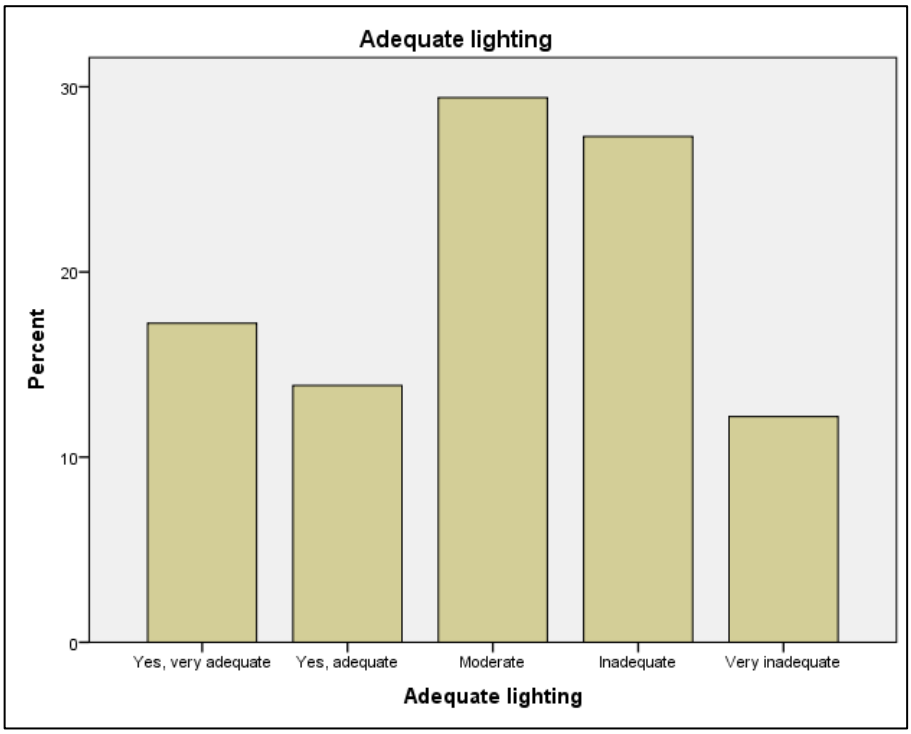
(U. W. Mahmood, 2024)

The Adequacy of Lighting Measures in the Walled City of Kano

The survey questioned whether the adequacy of lighting measures in the Walled City of Kano is in place or not which is part of the safety and security of livability parameters chosen because of how adequate lighting extends the usability of public spaces into the evening, supporting economic activities such as night markets, social gatherings, and cultural event. Participants of this survey revealed mixed opinions on the lighting measure with the walled city. Only 17.3% of respondents find it very adequate, while 13.5% find it adequate. 29.54% find it moderate, which is the highest rate from respondents, indicating it could be improved. However, 27.43% find it inadequate, and 12.23% find it very inadequate. This indicated that better lighting is needed in order areas for safety and security, especially at night, to better the overall livability and make it sustainable for its people as shown in (Figure 64).

Figure 64

Adequacy of Lighting Measures



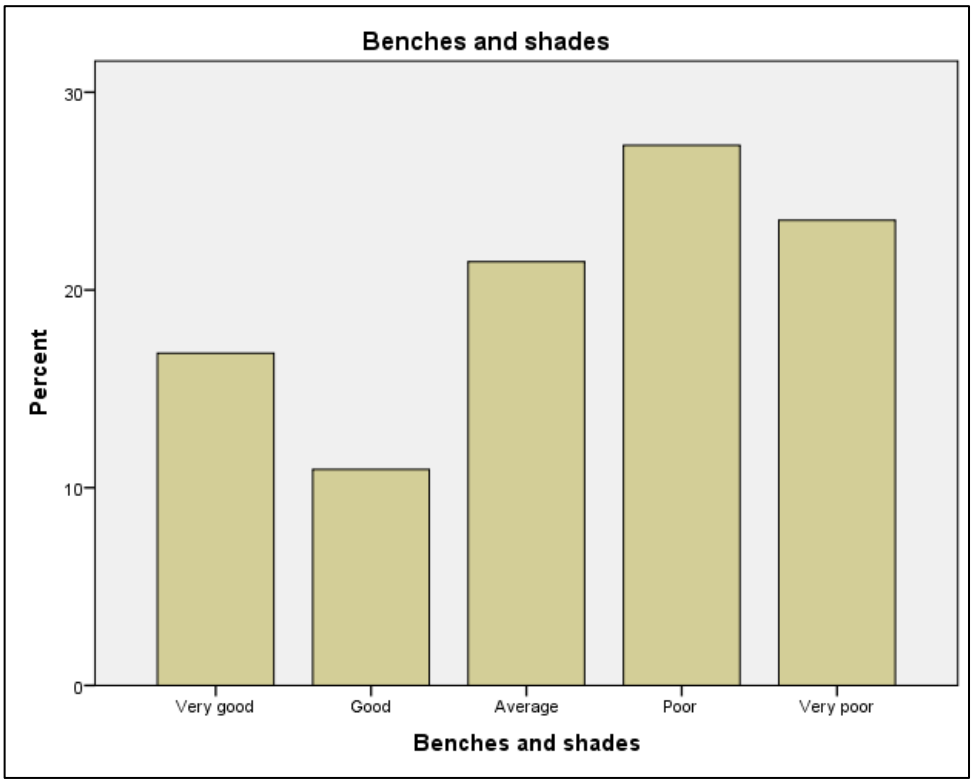
(U. W. Mahmood, 2024)

Number of Benches and Shades in the Walled City of Kano

A question directed to participants who engaged in the survey was, when walking in the city walls of Kano, how would the participants rate the number of benches and shade? Based on the responses the participant's benches and shades within the Walled City are rated as poor 27.7% and very poor 23.63% of respondents, indicating widespread dissatisfaction. The remaining 21.1% rated it average, suggesting moderate adequacy but potential gaps. Only 16.9% and 10.67% rated them very good or good, respectively, meeting expectations for a smaller population. These results emphasized the need to prioritize the provision and maintenance of benches and shaded areas for comfort, relaxation, and enhancing public spaces in urban areas as shown in (Figure 65).

Figure 65

Number of benches and Shades



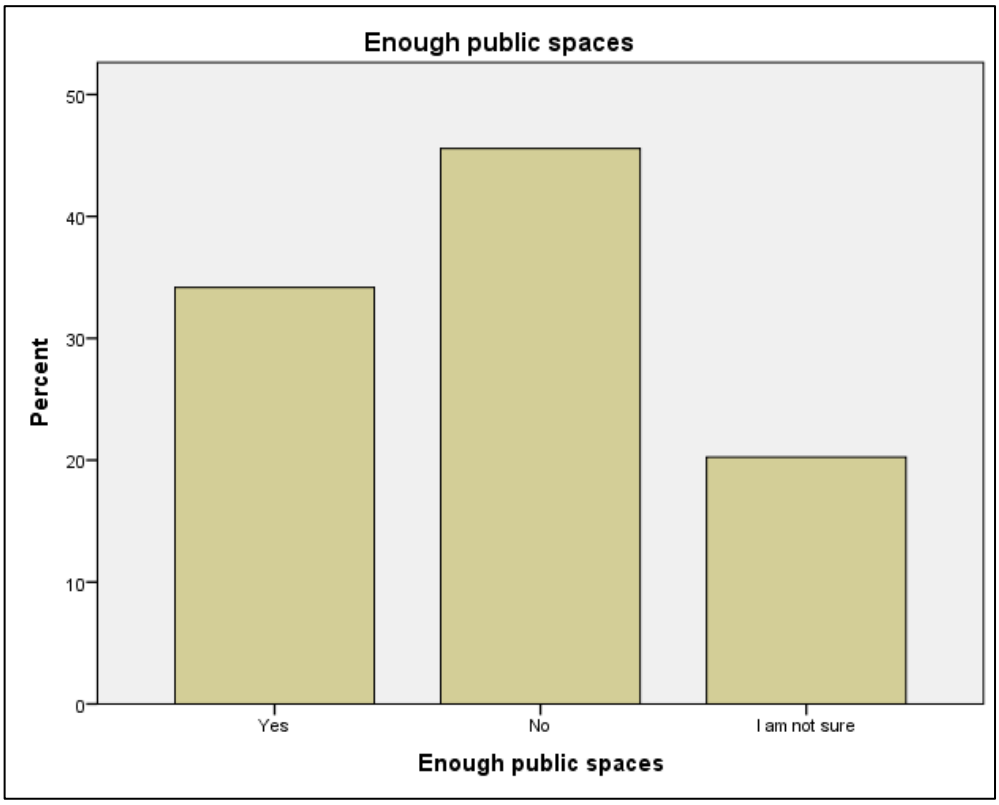
(U. W. Mahmood, 2024)

Availability of Public Space in the City Walled of Kano

With the availability of public areas in the walled city. The question was directed to the participants, are there enough public spaces like parks, gardens, squares, and sports areas in the Walled City of Kano? Participants responses from the survey, the majority of respondents believed there is a lack of public spaces, with 46% (no) believing there are not enough, 34.5% (yes) believing there are enough, and 19.5% (I am not sure) are uncertain due to limited access. The data survey indicated that enhancing public spaces could improve the Walled City's livability, social interaction, and recreational opportunities, highlighting the need for more public spaces as shown in (Figure 66).

Figure 66

Availability of Public Space



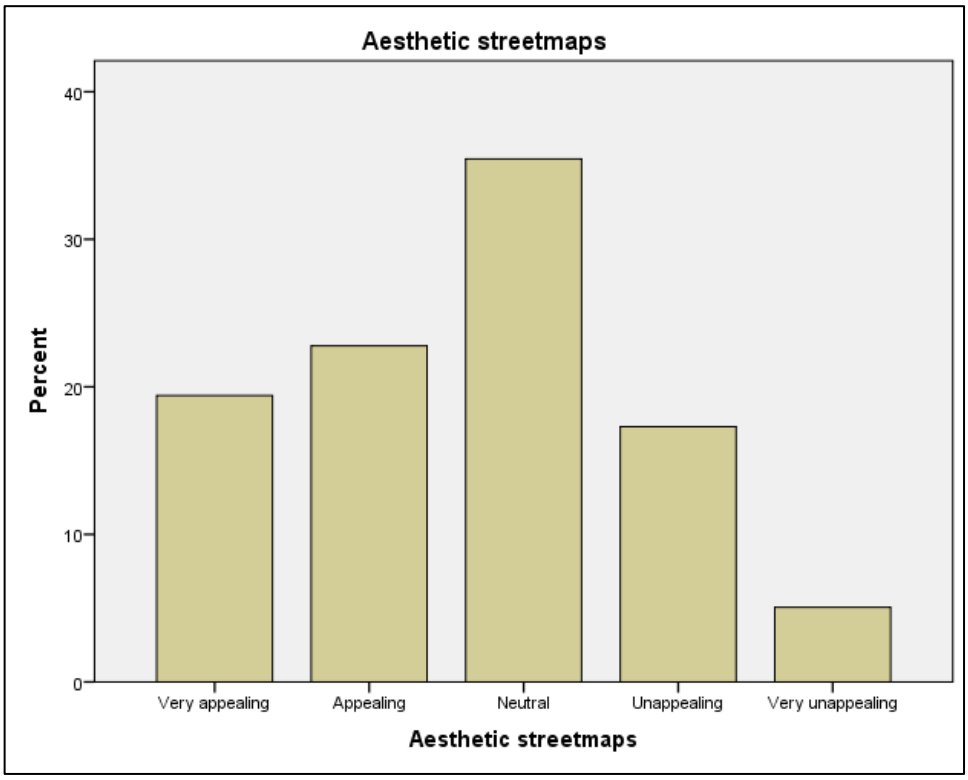
(U. W. Mahmood, 2024)

Aesthetical Appeal of Streetscapes and Architectural Features

The survey question directed participants to the aesthetic appeal of the Walled City based on streetscapes and architectural features. I on the question shows that 19.5% found them very appealing, 22.4% responded with appealing, 35.6% found them neutral, 17.3% found them unappealing and 5.2% found them very unappealing. Over 40% found the city's streetscapes and features appealing while other participants found them to lack strong opinions. Therefore, the results indicated the need for the preservation and enhancement of architectural and streetscape features to maintain and address areas lacking visual appeal as shown in (Figure 67).

Figure 67

Aesthetical Appeal of Streetscapes and Architectural Features



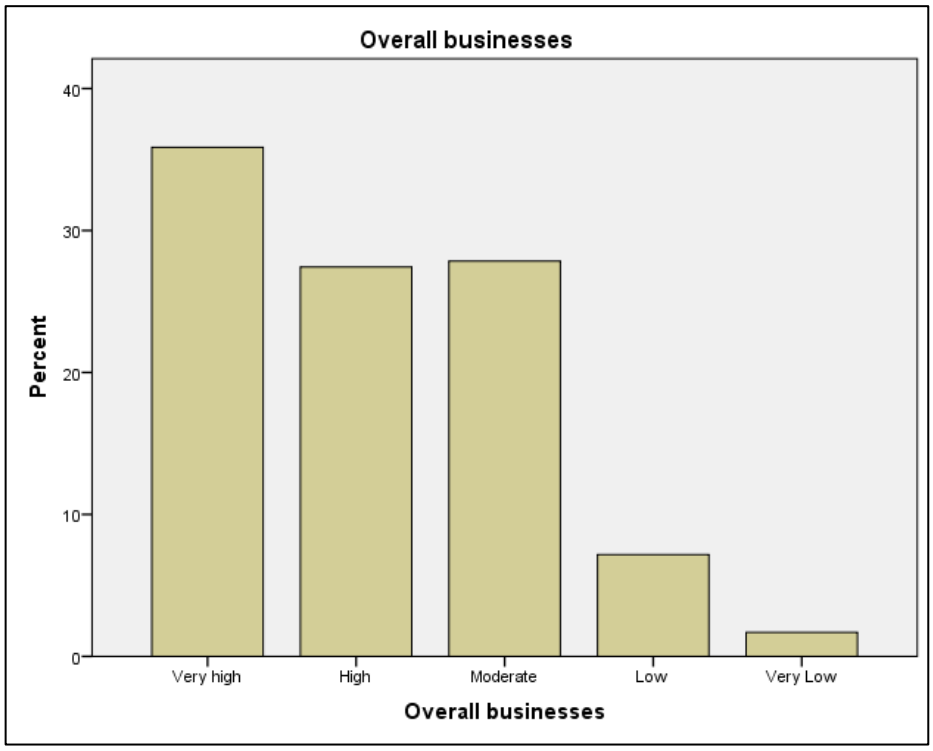
(U. W. Mahmood, 2024)

Overall Economic Vitality of Business in Kano Walled City

The question is, how would you rate the overall economic vitality of businesses in the Walled City of Kano? The findings revealed that 36% of respondents regarded economic activities in the city walls as very high and essential, while 27.5% considered them high. Nonetheless, 27.5% saw it as moderate, indicating business stability and the possibility of enhancement in some business fields of the walled City. 7.3% and 1.7% indicated low and very low business vitality, highlighting issues such as market constraints, infrastructure, or competition. The survey findings indicated considerable economic vitality. However, efforts may be required to solve obstacles that hinder growth and development and enhance equality as shown in (Figure 68).

Figure 68

Overall Economic Vitality of Business



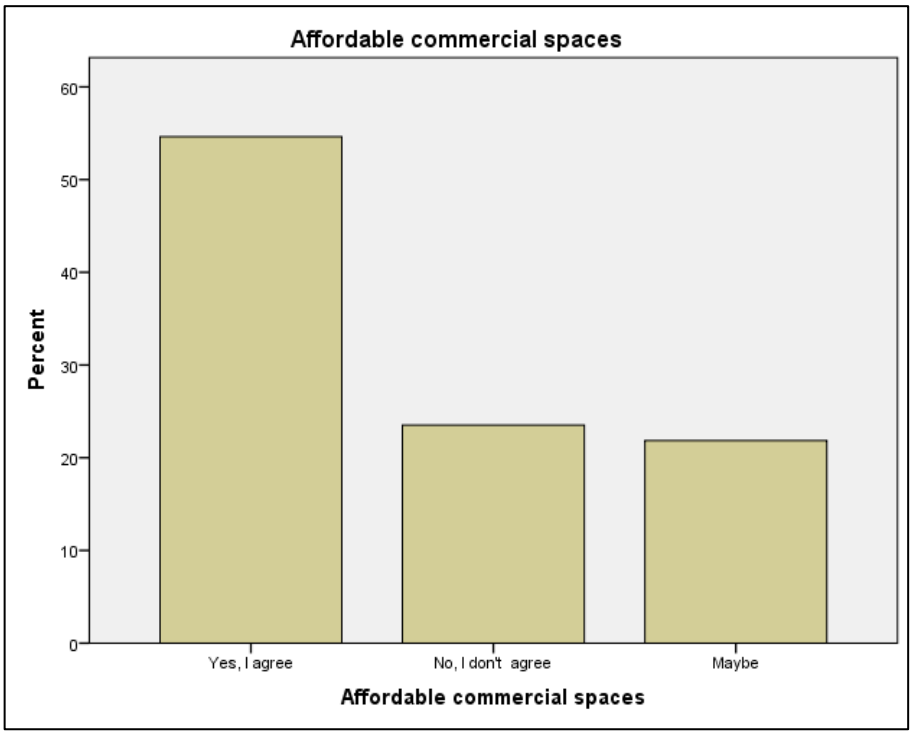
(U. W. Mahmood, 2024)

The Affordability of Commercial Spaces within the Walled City of Kano

The affordability of commercial spaces based on the survey question, are commercial spaces affordable in the Walled City of Kano? Participants revealed that 55.1% of participants agreed that the price is reasonable and accessible for business. However, 23.5% do not agree. Indicating that respondents perceived commercial spaces to be expensive and potentially hindering opportunities for small businesses. The remaining 21.4% are unsure, indicating variability in affordability based on location, size, or type. Addressing pricing disparities could foster equitable economic growth as shown in (figure 69).

Figure 69

Affordability of Commercial Spaces



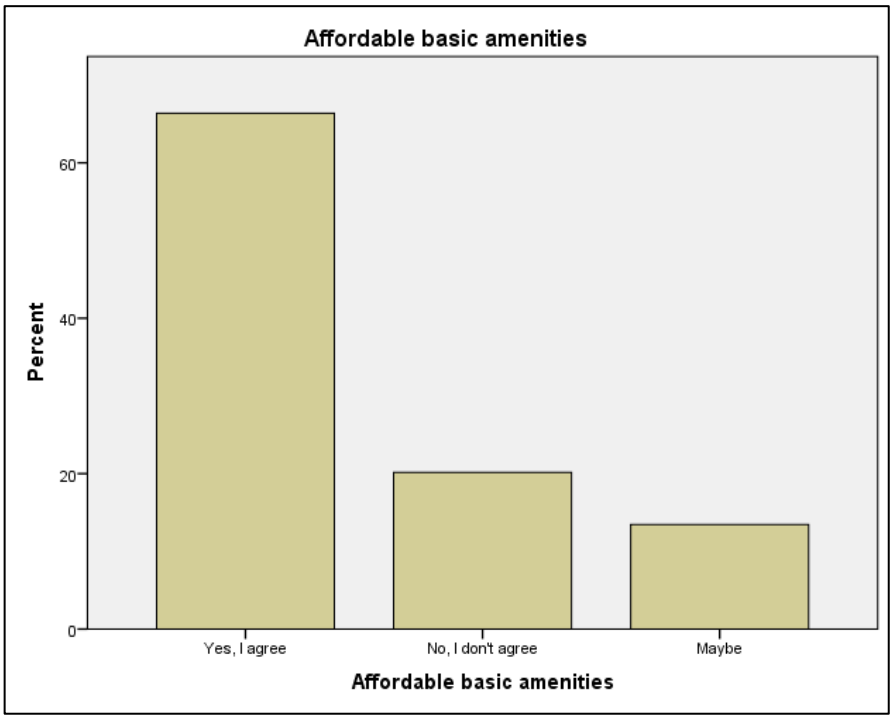
(U. W. Mahmood, 2024)

The Affordability of Basic Amenities in the Walled City of Kano

The survey data on the affordability of basic amenities such as utilities, groceries, and transportation in the Walled City of Kano indicated a positive perception of participants with 66.9% of respondents agreeing that basic amenities are affordable, indicating that the majority of the survey participants find the cost of living within the Walled City to be manageable. 19.9% of the respondents disagree, indicating that a significant minority faced challenges in the affordability of basic amenities, due to economic disparities or local cost variations. 13.2% are unsure, which may reflect different personal conditions or variations in prices across the Walled City of kano as shown in (Figure 70).

Figure 70

Affordability of Basic Amenities



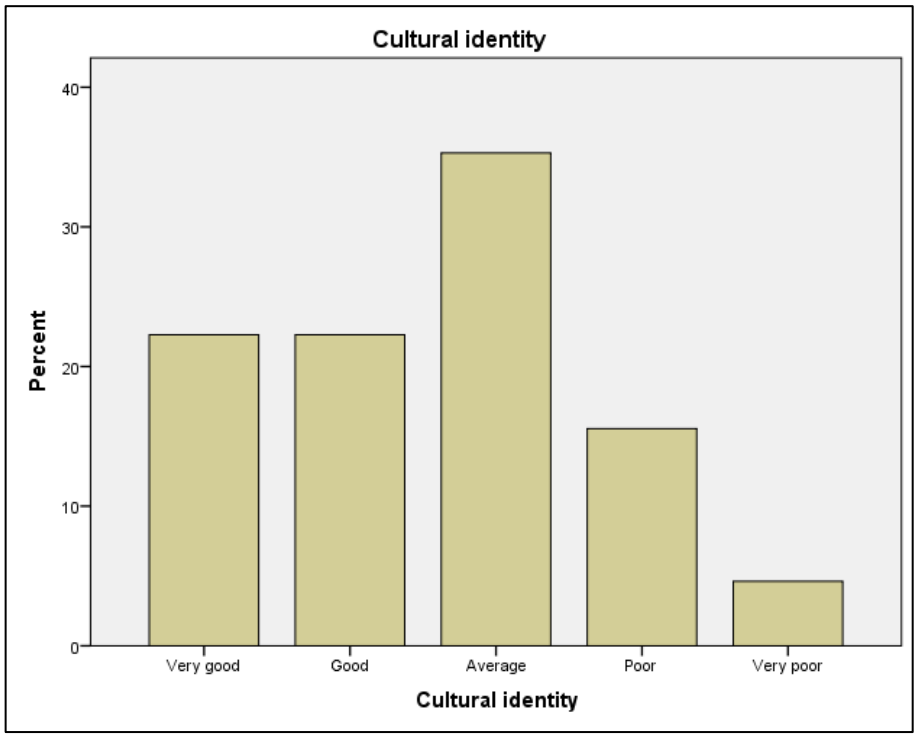
(U. W. Mahmood, 2024)

Maintaining Cultural Identity in terms of Infrastructure

In terms of maintaining the cultural uniqueness of the Walled City of Kano focusing on the infrastructure as a whole such as buildings, roads, etc. The survey data indicated that 22.36% of participants responded as very good and 22.36% as good, by adding up the two responses it indicated that 44.76% of respondents believe the city is doing well in preserving its cultural identity. However, 34.6% rated it as average, indicating there is a need for improvement. 15.62% and 4.64% of respondents rated it as poor and very poor, which might be due to neglect or urban development clashing with traditional aesthetics. This study indicated a need for determined preservation efforts to enhance and protect the city's cultural identity while addressing its challenges as shown in (Figure 71).

Figure 71

Maintaining Cultural Identity in terms of Infrastructure



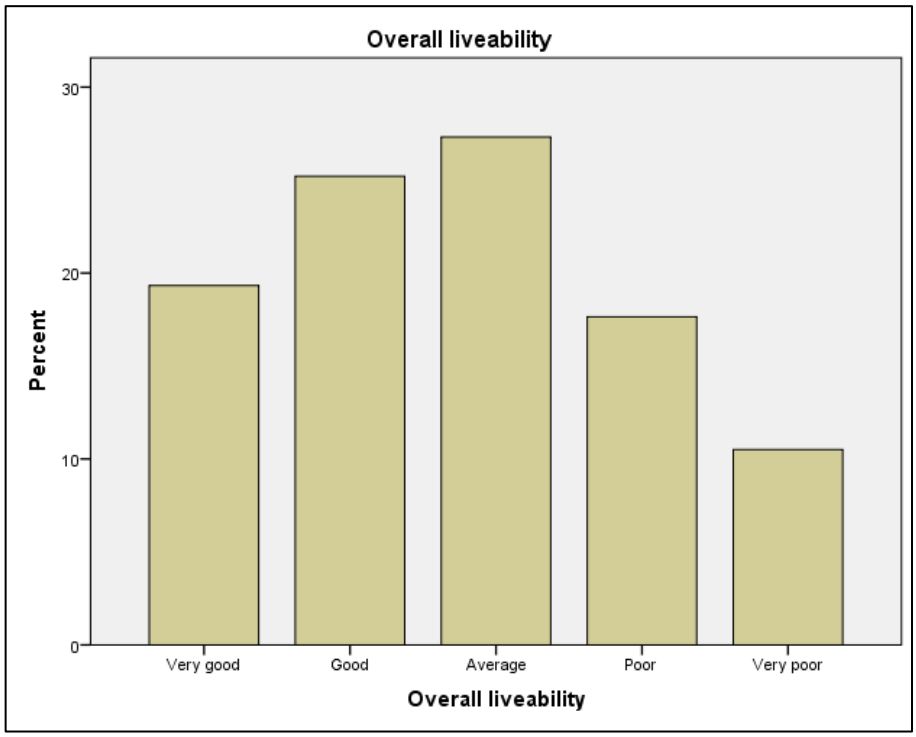
(U. W. Mahmood, 2024)

Overall Livability of the Walled City of Kano

The survey question, how would you rate the overall livability of the Walled City of Kano? Participants' responses indicated that 17.6% rated it as very good and 24.7% rated it as good, showing a wide range of respondents with over 40% of participants having a positive perception of living conditions. However, 27.4% of participants find it average, indicating an average satisfaction level, but some areas need improvement. On the negative side, 17.9% and 10.6% of respondents rate the overall livability as poor and very poor, indicating dissatisfaction due to challenges like overcrowding, infrastructure issues, or limitation of amenities and services. The findings indicated a different viewpoint, with many recognizing strengths but pointing to areas that need more attention to improve the Walled City's overall livability. (Figure 72) shows the bar chart of the overall livability of the Walled City based on the research findings.

Figure 72

Overall Livability of the Walled City



(U. W. Mahmood, 2024)

Section D: Sustainable Urban Growth in the Walled City of Kano

Under this section, participants are asked questions related to sustainable urban growth which include participants' ideas or knowledge of what sustainable urban growth is, and what the participants think about the efforts to ensure sustainable urban growth within the Walled City. Challenges faced in achieving sustainable urban growth within the Walled City and also what are the possible economic, social, and environmental strategies that are most in achieving and promoting urban growth sustainability in the Walled City of Kano with recommendations regarding urban growth sustainability within the Walled City.

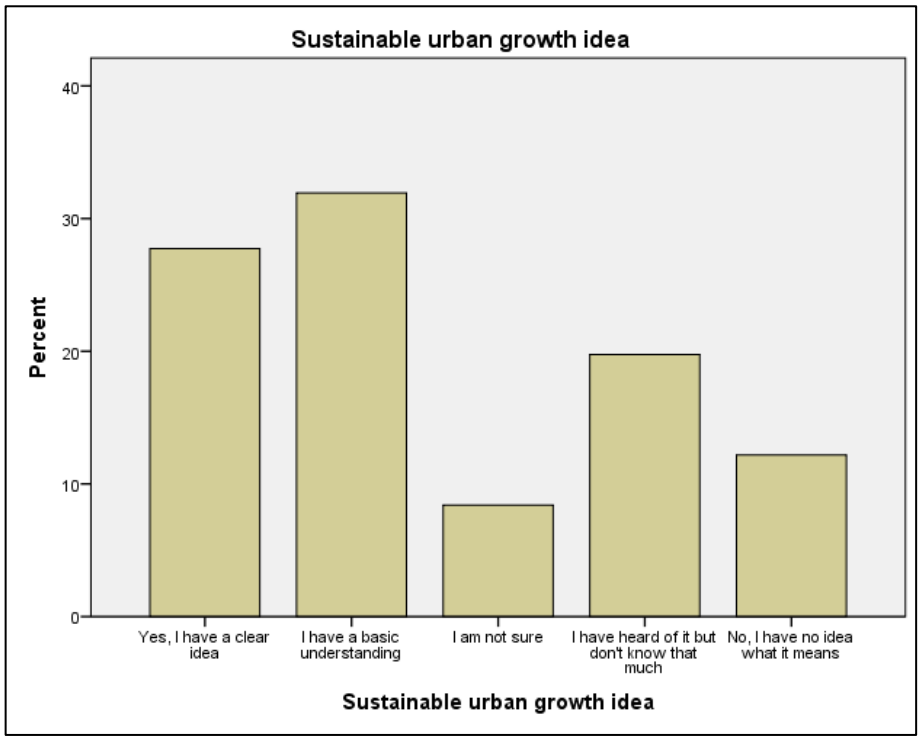
Participants Idea of What is Sustainable Urban Growth

The survey data is on participants' ideas of what sustainable urban growth means. The data on the idea indicated various levels of understanding among participants. Indicating 28% have a clear idea, 32% have a basic understanding, 7.7% are not sure, 19.9% have heard of it but do not know much and 12.4% have no idea. This study indicated that while some participants have an idea of what

sustainable urban growth is, there is a need for public awareness campaigns to promote an understanding of sustainable urban growth practices. (Figure 73) shows a presentation of the participants' knowledge of sustainable urban growth based on the research findings.

Figure 73

Participants' Idea on Sustainable Urban Growth



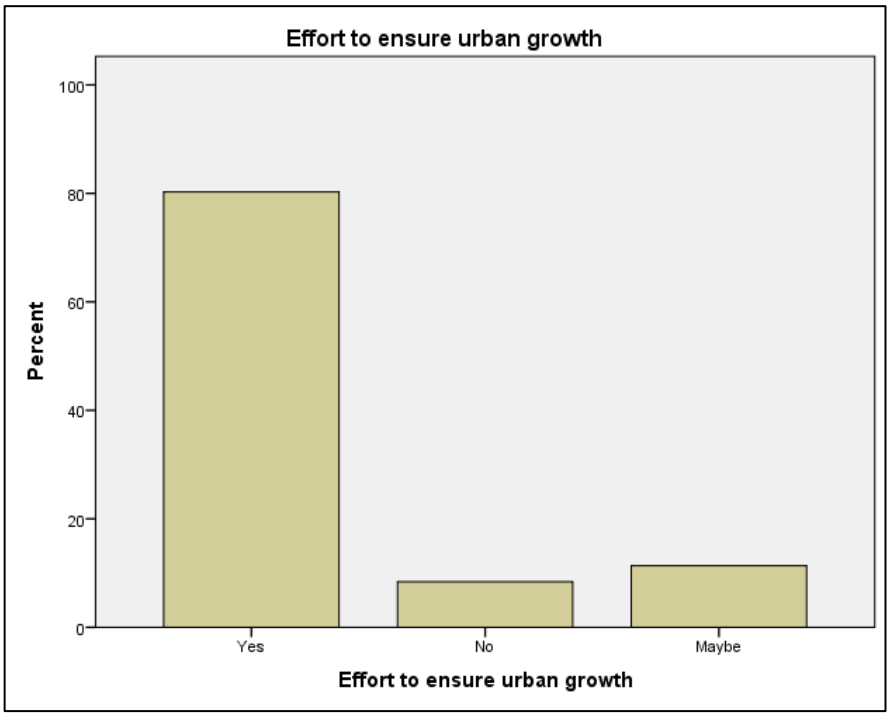
(U. W. Mahmood, 2024)

Efforts Ensuring Sustainable Urban Growth within Kano Walled City

The question is, do you think there should be more efforts to ensure sustainable urban growth within Kano Walled City? The data from participants indicated 81.3% (Yes), believe that more efforts are needed, 8.5% (No) of the participants disagree, and 10.2% (Maybe) are uncertain. This study indicated the need for policies and projects on sustainable urban growth practices as shown in (figure 74).

Figure 74

Efforts to Ensure Sustainable Urban Growth Practices



(U. W. Mahmood, 2024)

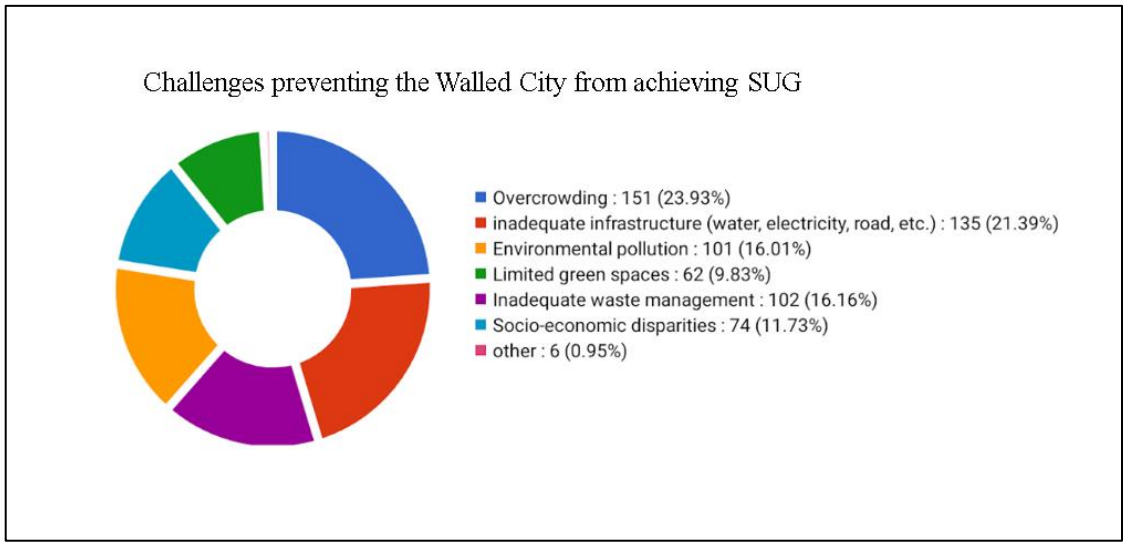
Challenges Preventing the Walled City from Achieving SUG.

The survey findings focused on the opinion of participants on challenges preventing the Walled City of Kano from achieving sustainable urban growth. The data from the questionnaire survey indicated that several challenges were identified which indicated 23.93% of participants mentioned overcrowding, reflecting issues about high population density and its impacts on infrastructure, resources, and quality of life. Then 21.39% of respondents mentioned inadequate infrastructure as another hindering challenge, indicating the need for better roads, buildings, utilities, and essential services. Also, 16.01% of participants mentioned environmental pollution and 16.16% mentioned inadequate waste management indicating issues with cleanliness and environmental quality are important for sustainability. 9.83% mentioned limited green spaces indicating a lack of parks and recreational areas, which are essential for environmental sustainability and community well-being. Followed by 11.73% of participants mentioned socioeconomic disparities which indicates inequality affecting access to resources and opportunities. 6% of participants mentioned other challenges like mobility issues, insecurity (Yan Daba

Clash), political leaders, and unclean road, which all challenges boil down to broader systemic and governance issues as shown in (Figure 75)

Figure 75

Challenges Preventing the Walled City from Achieving SUG.



(U. W. Mahmood, 2024)

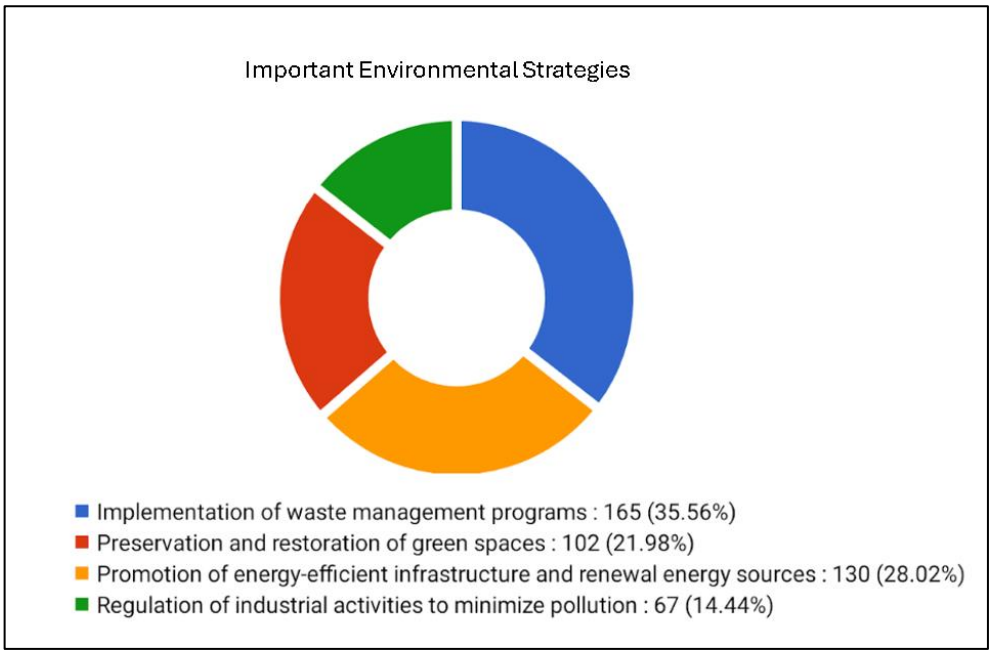
Important Environmental Strategies for Ensuring SUG within the Walled City

Based on the data survey collected from participants. The data indicated key environmental strategies the participants believe are important for ensuring sustainable urban growth within the Walled City of Kano.to begin with, 35.56% of participants mentioned the implementation of waste management programs. Which has the highest responses indicating significant concern about inadequate waste disposal and its effect on the well-being of the people and environmental quality of the walled city. Secondly, 28.02% of the respondents mentioned the promotion of resources from renewable energy and infrastructures that are energy efficient, thereby indicating the need for sustainable energy practices to lower reliance on non-renewable resources and fight against climate change. Also, 21.98% of participants mentioned the preservation and restoration of green spaces, which is considered by many respondents. Indicating green spaces contribute to environmental quality, reduction of urban heat, and improve the livability of urban cities. Lastly, 14.44% of the participants mentioned regulation of industrial activities to minimize pollution, which also identified concerns about industrial pollution and the need for control

policies to protect the environment in the Walled City of Kano. This research indicated the significance of implementing the integration of waste management, energy efficiency, green space preservation, and industrial regulation to achieve environmental sustainability in the Walled City of Kano as shown in (Figure 76).

Figure 76

Important Environmental Strategies for Ensuring SUG



(U. W. Mahmood, 2024)

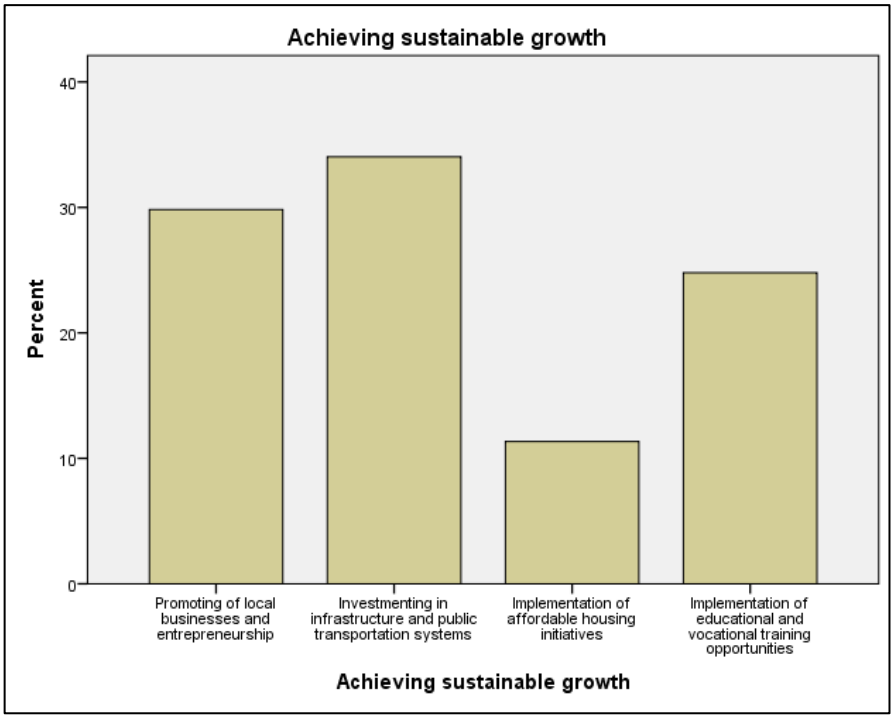
Important Economic Growth Aspects for Achieving SUG with the Walled City

This survey question considers the economic development in Kano Walled City; and what sort of aspects the participants feel are most important for achieving sustainable urban growth. The data collected from the participants about the question above will be identified. To begin with, 33.33% of participants mentioned investing in public transportation systems and infrastructure which reflects the necessity for improved connectivity and infrastructure to support economic growth and enhance livability within the Walled City. The next one is promoting local businesses and entrepreneurship with 29.96% of responses from participants, this aspect highlighted the significance of fostering economic self-reliance, creating jobs, and empowerment programs to support small businesses and startups. Next, 26.89% of participants mentioned the implementation of educational and vocational training opportunities emphasizing the role of skill development and education in enabling sustainable

economic growth and addressing socioeconomic differences. Lastly, 12.13% of participants mentioned the implementation of affordable housing initiatives ranked as the economic aspect with low response from participants. It identified the significance of providing housing solutions to support economic stability and reduce inequality. The study findings proposed that achieving sustainable urban growth requires a balanced approach, with a strong focus on infrastructure, business development, education, and housing to create a thriving and inclusive environment as shown in (Figure 77).

Figure 77

Important Economic Growth Aspects for Achieving SUG with the Walled City



(U. W. Mahmood, 2024)

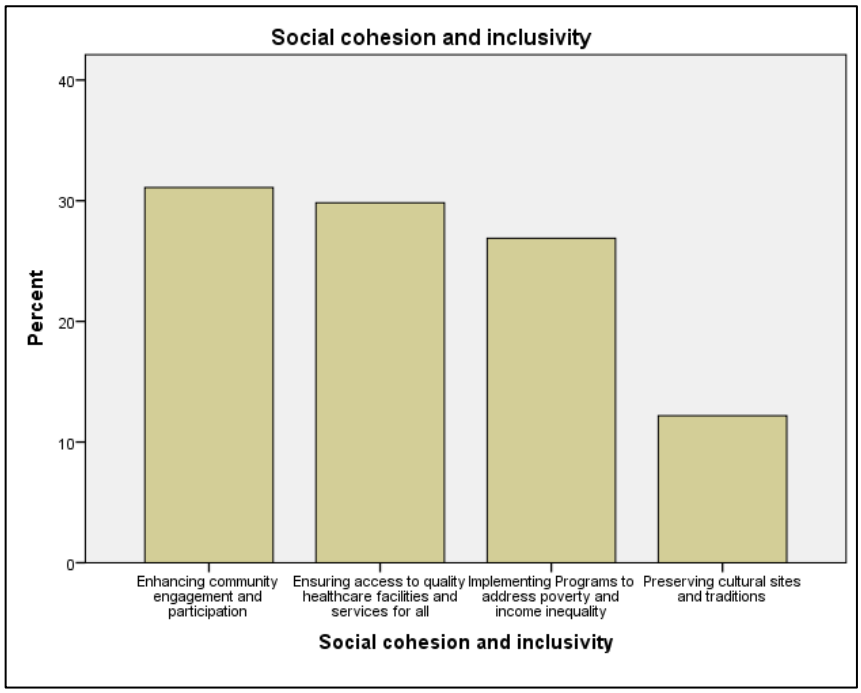
Social Aspects Essential for Promoting SUG within the Walled City

The survey findings showed that the social aspect participants considered to be essential for promoting sustainable urban growth within the Walled City of Kano. Participants' responses indicated that 31.22% mentioned enhancing community engagement and participation, which has the highest number of responses. 29.96% mentioned ensuring access to quality healthcare facilities and services for all. Then, 26.74% mentioned implementing programs to address poverty and income

inequality, and 13.24% mentioned preserving culture and traditions. This finding emphasized the necessity for a comprehensive procedure that integrates community participation, equitable access to services, poverty alleviation, and cultural preservation to achieve social cohesion and inclusivity as shown in (Figure 78).

Figure 78

Social Aspects Essential for Promoting SUG within the Walled City



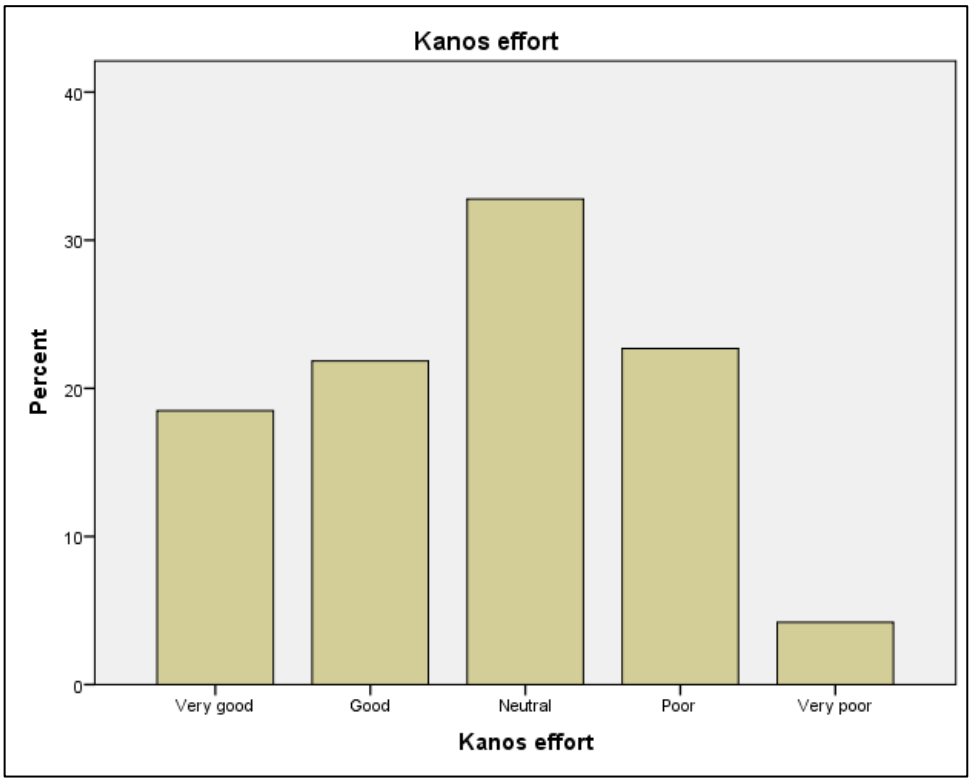
(U. W. Mahmood, 2024)

Walled City of Kano's efforts in Ensuring SUG while Preserving Cultural Identity

The data collected from the study indicated that 18.57% of participants rated the efforts as very good, 21.1% of participants as good, 32.65% of participants rated it neutral,23.46% rated it poor and 4.22 % rated it very poor. The study findings suggested the need for more impactful and visible actions to achieve sustainable urban growth while preserving the Walled City's cultural identity. Improving community engagement, enhancing policy implementation, and public awareness programs can help address the perception of the participants as shown in (Figure 79).

Figure 79

Efforts in Ensuring SUG while Preserving Cultural Identity



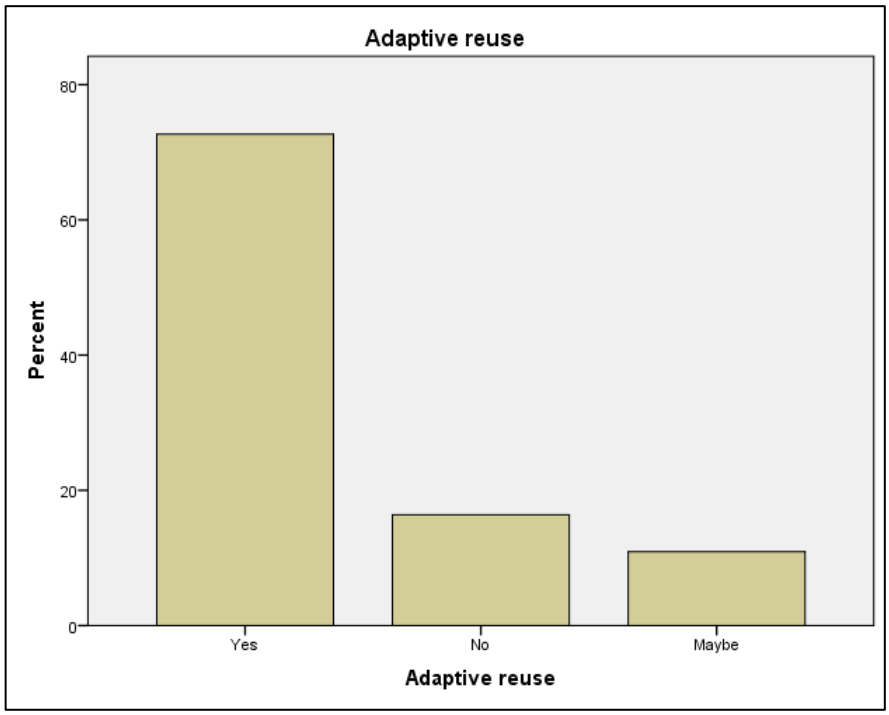
(U. W. Mahmood, 2024)

Participants thought on adaptive reuse of Old Buildings in the Walled City of Kano.

Data collected showed strong support for old buildings adaptive reuse within Kano Walled City to foster sustainable urban growth. 74.5% of participants agree on the adaptive reuse of the traditional structures in the Walled City. 16.02% disagreed, and 9.5% of participants did decide. The study findings indicated the importance of adaptive reuse as a strategy for urban growth sustainability, thereby making a balance between modernization and heritage conservation. Community engagement, awareness programs, and transparent planning can address the concerns as shown in (Figure 80).

Figure 80

Participants thought on adaptive reuse of Traditional Buildings.



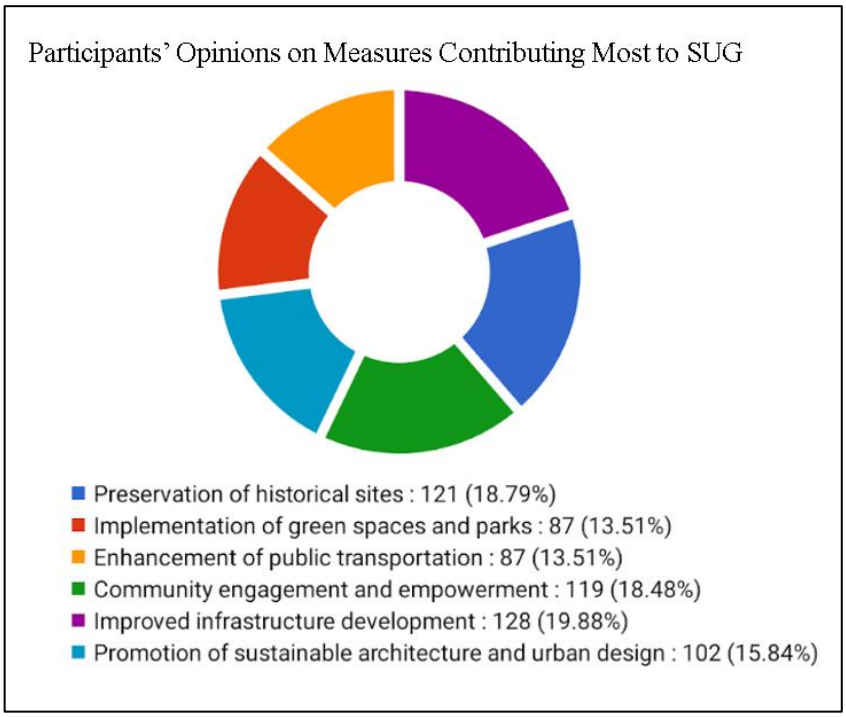
(U. W. Mahmood, 2024)

Participants' Opinion on Measures Contributing Most to SUG within the Walled City of Kano

This study's findings outlined several key measures that participants believe would significantly contribute to sustainable urban growth practices within the walled city of Kano. Participants indicated that 19.88% mentioned improved infrastructure development, 18.79% mentioned preservation of historical sites, 18.48% mentioned community engagement and empowerment, also, 15.84% mentioned promotion of sustainable architecture and urban design, and 13.51% mentioned implementation of green spaces and parks, and finally 13.51% of participants mentioned enhancement of public transportation. Based on the study, the findings indicated the necessity for a wide-ranging approach to sustainable urban growth, integrating infrastructure development, heritage preservation, community engagement, sustainable design and planning, and environmental management as shown in (Figure 81).

Figure 81

Participants' Opinions on Measures Contributing Most to SUG



(U. W. Mahmood, 2024)

Participants' Recommendation Regarding SUG in the Walled City of Kano

Participants' recommendations regarding sustainable urban growth with the Walled City of Kano recommended the speedy pace of urban growth and the problems it poses to cities. The participants recommended implementing green spaces, public awareness of proper refuse management, and promoting sustainable architecture and urban design. They also highlighted the need for improved infrastructure and public transportation, addressing poverty and illiteracy, and protecting the environment. They also suggested capital investments from foreign investors, proper waste management, upgrading roads, drainage, and public services, and providing skills training for sustainable practices and entrepreneurship. They also highlighted the importance of addressing income inequality, promoting community engagement, and enhancing security. They also highlighted the need for better infrastructure, social amenities, and education to address the challenges of urbanization. They also highlighted the need for a better design and transportation system, as well as the need for social amenities to support local businesses and

reduce urban growth. In conclusion, the participants emphasized the necessity for detailed practice for sustainable urban growth in Kano.

Evaluation of Findings.

The study findings revealed significant livability challenges in the Walled City of Kano, including environmental challenges, access to basic amenities and services, safety and security, walkability and mobility limitations, and economic instability. The high population density in the Walled City of Kano causes challenges such as overcrowding of public spaces, deterioration of infrastructure, waste generation, and reduced level of livability. The government and stakeholders in the Walled City have various levels of support for sustainable urban growth practices, with gaps in policymaking, engagements of stakeholders, and limitations of resources. This study suggested several approaches including improving accessibility, developing environmental sustainability, encouraging social mobility, supporting economic vitality, ensuring safety and security, and preserving the cultural identity of the Walled City to improve the standard of living. Evaluation from findings indicated that the Walled City of Kano faces significant livability challenges due to its high population density, rapid urban growth, and inadequate infrastructure. The study offered solutions to improve the livability of the Walled City and also proposed strategies for sustainable urban growth. (Table 6) a presentation of the evaluation of the research findings according to the livability parameters and considerations for sustainable Urban growth in Kano Walled City as the study area.

Table 6

Evaluation of Findings of Study Area

Livability Parameters	**Assessment Criteria**	**Findings from Case Study Area**	**Considerations for Sustainable Urban Growth**
Accessibility	Ease of access and availability of basic amenities such as healthcare, schooling, and public spaces for people with different age groups and abilities.	The analysis indicates significant differences in the accessibility of basic services within the Walled City of Kano.	Implementing inclusive urban design and planning based on universal design principles will ensure equitable access to basic services in the Walled City.

Table 6 Continued

Socio-Cultural Diversity	To assess the different range of commercial, social, and cultural activities happening in the walled city.	Analysis reveals that pressure from rapid urbanization and modernization affects cultural and social diversity in the Walled City of Kano.	Supporting cultural festivals, fostering spaces that promote social inclusion, and maintaining traditional markets will help maintain the socio-cultural diversity of the Walled City.
Walkability	Availability of pedestrian-friendly pathways and the proximity of basic services within the Walled City.	The study indicates that in the Walled City of Kano, there are limited pathways and proximity to basic services. Thereby causing high dependency on transport vehicles.	Promoting walkability through the provision of shaded walkways, street lighting, and improving the pedestrian infrastructure will help in achieving urban sustainability within Kano's Walled City.
Transportation	To assess the availability of efficient transportation systems.	According to the findings, there is a lack of efficient transportation systems within the Walled City.	Introducing different transportation options based on transit-oriented development can help address the transportation challenges in the Walled City.
Sociability	To assess community engagements, cultural activities, and social interactions in the Walled City.	Findings reveal that the sociability of the Walled City is being threatened by the encroachment of commercial activities on communal areas has limited the spaces for social interaction.	Strengthening community ties and enhancing social interaction within the Walled City is required for its sustainability.
Landscaping	Availability and quality of green areas, neighbourhood parks, natural vegetation, and aesthetics.	The study findings indicate the low availability of green areas and neighbourhood parks in the city walls of Kano.	To achieve sustainability in Kano's Walled City. Enhancing landscaping, establishment of urban parks and gardens, and development of eco-friendly public spaces will help improve the biodiversity of the city.

Table 6 Continued

Economic Vitality	To assess the level of commercial activities and how active and vibrant are the public spaces.	The findings reveal the lack of formal regulations and infrastructure limits opportunities for economic growth and stability in the Walled City.	Implementing urban policies that will promote local businesses, improve financial access to resources, and develop vibrant public spaces will add to the economic strength of the Walled City of Kano.
Safety and Security	To analyse the level of security in the Walled City both in crime rate and safety in public spaces and streets.	The study indicates inadequate streetlights in public spaces and crime rates in some areas are affecting the livability of the Walled City of Kano.	Designing safe and sustainable streets and public spaces that foster community interaction and peace among the people of the Walled City is encouraged.
Well-being & Health	To assess the overall livability and the people's quality of life within Kano Walled City.	Findings from Walled City are said to have limited healthcare and poor environmental hygiene, affecting the livability of the people.	Expanding healthcare infrastructure and creating spaces for community engagement and recreation will enhance the sustainability and livability of the Walled City of Kano.
Infrastructure Management	To analyse the quality and maintenance of public facilities.	From the study finding the Walled City of Kano's infrastructure is poorly maintained and outdated. Poor drainage systems, inconsistent electricity, and water supply thereby affecting the people's quality of life.	Providing modern and resilient technologies, smart infrastructures, and efficient maintenance programs can improve the services and enhance the urban functionality of the Walled City of Kano.

(U. W. Mahmood, 2024)

CHAPTER V
Discussion

This chapter provides a discussion of the findings with the literature reviewed in this study. Findings from this research on the livability of the Walled City of Kano revealed an effective connection between the ancient urban environment and sustainable urban growth. This evaluation, based on the analysed findings from the evaluated studies and research fields, provides differences, similarities, and new ideas that add to current discussions on livability in urban areas for sustainable urban growth.

To begin with, the findings highlighted major challenges in achieving equitable access to essential services such as education, healthcare, and public spaces in the Walled City of Kano, related to previous studies that identified problems faced by urban areas in achieving accessibility standards, attributed to its congested and poorly designed urban infrastructure, as discussed by Dankani in 2016. The study findings revealed the importance of societal solutions such as neighbourhood centres for community services, in addressing these issues without having significant spatial changes. The Walled City of Kano highlights a vibrant mixture of commercial and cultural activities, referring to earlier studies that indicated the socio-cultural activities in old cities as a significant asset. Nevertheless, the results of this study indicated that urban challenges like urbanization and industrialization are affecting certain cultural activities. This point of view aligns with existing research studies, highlighting issues related to the uniformity of cultural identities in rapidly growing urban areas. This finding, along with existing literature, shows walkability as a significant issue in urban areas primarily because of its narrow and organic pathways stated by Dankani in 2016. The findings from the study pointed out numerous possibilities to enhance walkability by modest measures, including setting objectives based on policies based on pedestrian priority and shaded pathways, which were studied in the existing literature.

The data collected supports the theory found in studies related to transportation systems in urban areas that frequently lack proper integration and fall short of meeting today's needs. This research improved on the above findings by focusing on the options provided by different transportation methods, like transit-oriented developments to reduce congestion while maintaining the Walled City's

livability. The research supported the existing literature regarding the significance of community areas in promoting livability based on public involvement and social interaction in urban areas. Nonetheless, the findings show the presence of commercial activities as a distinct challenge for the Walled City, thereby necessitating the implementation of policy measures that consider the protection of public spaces.

In alignment with earlier studies from the literature reviewed, environmental degradation caused by poor waste management, inadequate green spaces, and pollution is constant in global studies of urban areas as it was discussed by Saeed et al in 2022. This finding indicated the lack of green areas in the Walled City of Kano leads to environmental pollution. Nonetheless, the findings highlighted the need for enhancing the landscaping of the Walled City through the development of eco-friendly public spaces and urban gardens that will improve biodiversity and reduce environmental pollution and urban heat effects within the Walled City of Kano. Also, the results revealed the importance of existing literature on the nature of inefficient and outdated infrastructure as a barrier to achieving sustainability in urban areas. This study enhances understanding by showing how resilient technologies such as solar-powered facilities can help tackle issues such as the inadequate supply of electricity and water in the Walled City of Kano. However, unethical economic behaviours are indicated by the findings which are being validated by existing literature. The study highlighted a significant deficiency in proper government support for these activities, indicating the necessity for focused policies and financial strategies. Moreover, existing literature shows the significance of governance. This study critically analysed the inconsistent approach to government and stakeholder involvement within the city walls of Kano, which prevents the achievement of sustainable urban growth.

Correspondingly, focusing on the research questions of the study, results revealed various livability problems that exist in the Walled City of Kano such as limited access to basic services and amenities due to not well-planned layout and inadequate infrastructure, ineffective waste management that destructs the urban environment and lack of green space in the Walled City of Kano. Also, adequate lighting and an increased crime rate affect the livability of the people regarding security, and unregulated informal economic activities within the Walled provide livelihood but lack stability. These findings corresponded with earlier studies,

indicating that old cities struggle with adapting to modern urban challenges while retaining their cultural identity following the study of Hashim and Deby in 2010. The study pointed out the negative impact of high population density on the physical environment and public places and buildings within the Walled City which includes, overcrowding, deterioration of infrastructure, and environmental pressure related to increased waste generation and pollution. This study confirmed observations in previous studies that overpopulation increases urban challenges.

Again, in compliance with the study question that stated, ‘Are the government and stakeholders of the Walled City of Kano in support of adopting sustainable urban growth practices?’ The study highlighted limited support for sustainable urban growth practices, such as community heads and residents showing concerns about losing the cultural identity of the Walled City of Kano but showing no interest in participatory planning. The finding aligned with studies from literature highlighting the significance of inclusive governance. Scarcity of resources fragmented policy implementations. Based on what sustainable urban growth strategies can be proposed to improve livability in the walled city of Kano is stated such as Introducing different transportation options based on transit-oriented development can help address the transportation challenges in the Walled City, supporting cultural festivals, fostering spaces that promote social inclusion, and maintaining traditional markets will help in maintaining social and cultural diversity of the Walled City of Kano.

Also, designing safe and sustainable streets and public spaces that foster community interaction and peace among the people of the Walled City is encouraged, implementing urban policies that will promote local businesses, improve financial access to resources, and develop vibrant public spaces will help to the economic strength of the Walled City of Kano. Strategies like providing modern and resilient technologies, smart infrastructures, and efficient maintenance programs can improve the services and enhance the urban functionality of the Walled City of Kano. Other strategies include expanding healthcare infrastructure and creating spaces for community engagement and recreation will enhance the sustainability and livability of the Walled City of Kano. Strengthening community ties and enhancing social interaction within the Walled City is required for its sustainability.

However, the Walled city of Kano faces various livability challenges, including restricted access to important services, environmental issues due to lack of

green areas, ineffective management of waste products, safety issues caused by inadequate lighting and increased crime rates, and economic vulnerability due to unregulated informal economic activities. These issues align with existing literature on historic cities adapting to modern urban challenges while maintaining their cultural identity. High population density negatively affects the physical environment and community spaces, including overcrowding, infrastructure strain, and environmental pressure. The government and stakeholders in the Walled City of Kano show some level of support for sustainable urban practices, with uneven implementation and inadequate resources. Community leaders and residents express concerns about losing cultural identity but show interest in participatory planning. To improve livability in the Walled City of Kano sustainable urban growth strategies are proposed in the study including improved accessibility, sustainable infrastructure implementation, strengthening stakeholder participation in decision-making, and improving the socio-economic activities of the walled city of Kano. These strategies complement the reviewed studies on integrating sustainable urban growth and suggest actionable recommendations for the Walled City of Kano.

CHAPTER VI
Conclusion and Recommendations

This chapter concludes the study on the Walled City of Kano by analysing its livability based on findings from studied literature and the study's objectives and sub-objectives. The research recommendations are emphasized as significant guidance for urban planners, architects, policymakers, and professionals in discharging their roles. The future recommendation section is designed to summarize the study by strategically analysing the findings and suggesting areas for further study in subsequent research.

Conclusion

In conclusion, the Walled City of Kano is an interesting case study area for analysing livability in urban areas for sustainable urban growth. This study indicated how the integration of environmental sustainability, social equality, and resilience into the designing, planning, and development of urban areas or cities can be important, especially in an area with different urban dynamics and cultural identity like the study area of this research. An analysis of the current condition of the Kano Walled City was conducted. Findings indicated that the current condition of the Walled City of Kano is relatively inadequate, influenced by factors that include environmental pollution, ineffective waste management, and substandard infrastructure in terms of narrow pathways and insufficient public services. The absence of appropriate green spaces imposes a negative effect on the livability condition. Other major factors are socio-economic challenges such as poverty, lack of good healthcare services, and education. Furthermore, the government is neglecting the maintenance and preservation of cultural identity. Hence, environmental degradation, inadequacy of infrastructure, preservation of cultural identity, poor governance, and high population density are the primary factors affecting livability in the Walled City of Kano.

Despite the challenges faced by the Walled City, the findings proposed sustainable urban growth strategies that can enhance the livability of the Walled City of Kano. These include awareness programs aimed at educating the people and government officials on the implementation of sustainable urban growth practices, which will contribute to the enhancement and sustainability of the Kano Walled

City. Inclusive urban design and planning based on universal design principles will help provide equitable access to basic services, foster cultural activities, enhance social inclusion, and preserve traditional marketplaces. Improving walkability by providing shaded walkways, enhancing streetlights, and upgrading pedestrian infrastructure would contribute to preserving the cultural and socioeconomic diversity, and will help enhance and improve the livability and sustainability of the Walled City of Kano.

Implementation of transit-oriented development can also help address transportation challenges. Strengthening community ties and social interaction is essential for enhancing the livability and sustainability of the Walled City of Kano. Upgrading landscaping and provision of urban parks, gardens, and sustainable public spaces will improve the biodiversity of the Walled City of Kano. The execution of urban policies that promote local businesses and enhanced financial resource accessibility would contribute to the economic vitality of the Walled City of Kano. Implementation of modern and resilient technologies, smart infrastructure, and efficient maintenance of facilities will help improve the services and urban functionality of the Walled City of Kano. Enhancing education and healthcare infrastructure, together with increasing gathering spaces for social interaction, will significantly improve the quality of life, well-being, and sustainability of residents within the Kano Walled City. The livability of the Walled City of Kano must be addressed with urbanization and overall quality of life. It includes the adoption of sustainable urban growth strategies, competent governance, and stakeholders' involvement to ensure a livable and long-term sustainability of the Walled City of Kano.

In conclusion, improving the livability of the Walled City of Kano requires a comprehensive strategy that integrates livability with urban growth. The implementation of sustainable urban growth practices with effective governance and stakeholders will ensure a viable and long-term sustainability of the Walled City of Kano.

Recommendations

This study is addressed by proposing a multi-faceted approach to enhancing livability toward achieving sustainable urban growth within Kano City Walls. First and foremost, there is a need to emphasize the retention of creative alteration of its

monumental buildings as a reliable technique of helping the city retain its unique culture in addressing current urban problems such as infrastructure and environmental degradation caused by its high population density. Policies must focus on inclusive urban planning, efficient greenery, equitable access to basic services, and effective waste management systems. Besides, other stakeholders who participate in the decision-making to develop solutions, including urban planners, policymakers, and individuals in government in addressing the demand of the people while encouraging society involvement regarding development efforts are encouraged. These above-mentioned measures would go a long way to upgrade the livability, lifestyle quality, and sustainability of its citizens in the Kano Walled City.

Recommendation According to the Findings

These recommendations are, therefore, made in the context of findings and conclusion on how best the Walled City of Kano should be made to live in for sustainable urban growth:

- There is a need for the improvement in accessibility of services within the walled city of Kano by developing accessible centres with services related to health, education, and public spaces. Application of universal design principles to make this inclusive to all ages and abilities.
- The recommendations also go for the aspect of enhancing environmental sustainability by developing green open spaces through creating urban parks, gardens, and tree planting, with the implementation of solid waste management systems and supporting renewable sources of energy.
- To recommend improvements related to walkability and transportation by enhancing pedestrian-friendly pathways and multiple means of transportation systems of the walled city based on findings.
- Recommendations include the socio-cultural identity that needs to be preserved by adaptively reusing historic buildings, cultural activities, and markets of the walled city.
- Recommendations are that economic vitality should be improved through diversification of the economy and formalization of the informal economic activities in the Walled City of Kano.

- It is recommended that public spaces and safety of the Walled City of Kano be improved through enhanced lighting, active surveillance, and community policing programs.
- The findings of the research also recommend modernizing the infrastructure of the Walled City by upgrading and maintaining essential systems and integrating smart technologies for efficient management and service delivery to the people.
- The findings also recommend strengthening the governance and stakeholder engagement of establishment processes of participative urban planning frameworks that encourage determined efforts between private sector organizations, government agencies, and nongovernmental organizations in attaining the livability and sustainability of the Walled City of Kano.

Recommendation for Further Research

Further studies should be encouraged to improve knowledge of the factors influencing the livability and sustainability of Kano Walled City. The subsequent recommendations are listed as follows:

- Detailed Studies are required to analyse the impacts public urban design has on social well-being and government competence in the implementation of livable and sustainable growth within the Walled City of Kano.
- Further studies need to be done on socio-economic factors affecting the people, equal access to services, and types of housing to guide policies more effectively toward sustainability and inclusiveness in the Walled City of Kano's growth.
- Advancing studies on new ideas on appropriate sustainable building, energy efficiency, and environmental sustainability related to the condition of the Walled City of Kano.

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APPENDICES

Appendix A

QUESTIONNAIRE SURVEY
ANALYZING THE LIVEABILITY OF URBAN AREAS FOR SUSTAINABLE URBAN GROWTH: THE WALLED CITY OF KANO

Dear Participant,
My name is Ummulkalthum Mahmood, and I am a master's student in the Department of Architecture at Near East University Nicosia, North Cyprus. I appreciate your participation in this study, which aims to comprehensively analyse the liveability of urban areas: The walled city of Kano State. Your valuable insights will contribute significantly to the research in the field of Architecture.
Please answer the following questions honestly and to the best of your ability. Your responses will be kept confidential, and the data collected will only be used for research purposes.

Section A: General Information

1. **What is your gender?**
   ☐Male ☐Female ☐Prefer not to say.

2. **What is your age range?**
   ☐18-24 ☐25-34 ☐35-44 ☐45-54 ☐55 years and Above

3. **Do you have any disability?**
   ☐Yes ☐No

Section B: Walled City of Kano

4. **Which current region do you live in in the Walled City of Kano?**
   ☐Dala (Gwamaja) ☐Gwale ☐Kano Municipal (Yakasai)

5. **Why do you visit the Walled City of Kano?**
   ☐Tourism ☐Commercial visit ☐Medical visit ☐Recreational ☐Family Gathering
   ☐Other: (*please specify*) …….

6. **What kind of transportation types do you use within the Walled City of Kano?**
   ☐Walking ☐Bicycle ☐Public transportation
   ☐Private car ☐Motorcycle ☐Other: (*please specify)* ……...

7. **Do you feel safe and secure while walking through the streets of the Walled City of Kano?**
   ☐5-Very safe ☐4-Safe ☐3-Neutral ☐2-Unsafe ☐1-Very unsafe

Section C: Livability of the Walled City of Kano

8. **Are the entrances and gates within the historical walled city of Kano easily accessible?**
   ☐Yes ☐No ☐Maybe

9. **Is the current quality of life within the walled city of Kano livable?**
   ☐Yes ☐No ☐Maybe

10. **How would you rate the population density of the Walled City of Kano?**
    ☐5-Very high ☐4-High ☐3-Moderate ☐2-Low ☐1-Very low

11. **How easily accessible are the public transportation services within the walled city of Kano?**
    ☐5-Very accessible ☐4- Accessible ☐3-Neutral ☐2-Not accessible ☐1- I do not know

12. **What are the main challenges you face in accessing hospitals, schools, banks, etc. buildings within the Walled City of Kano?**
    ☐Overcrowding ☐Lack of infrastructure ☐Limited transportation options ☐No signpost and way findings ☐Accessibility issues for persons with disability

13. **How would you rate the availability of infrastructure such as ramps, elevators, and accessible pathways for individuals with disabilities within the Walled City of Kano?**
    ☐5-Very good ☐4-Good ☐3-Average ☐2-Poor ☐1-Very poor

14. **Are there enough social activities in the Walled City of Kano?**
    ☐Yes ☐No ☐Maybe

15. **How often do you engage in social activities (e.g., gatherings, events) within the Walled City of Kano?**
    ☐Often ☐Sometimes ☐Never

16. **What types of activities or events do you think would contribute to enhancing the vitality of the Walled City of Kano?**
    ☐Cultural festivals ☐Art exhibitions ☐Street markets ☐Musical performances ☐Community sport events

17. **Are there adequate lighting measures in place within the Walled City of Kano?**
    ☐Yes, very adequate ☐Yes, adequate ☐Moderate ☐Inadequate ☐Very inadequate

18. **When walking in the Walled City of Kano, how would you rate the number of benches and shades?**
☐5-Very good ☐4-Good ☐3-Average ☐2-Poor ☐1-Very poor

19. **Are there enough public spaces like parks, gardens, squares, and sports areas in the Walled City of Kano?**
☐Yes ☐No ☐I am not sure

20. **How aesthetically pleasing are the streetscapes and architectural features within the Walled City of Kano?**
☐5-Very appealing ☐4-Appealing ☐3-Neutral ☐2-Unappealing
☐1-Very unappealing

21. **How would you rate the overall economic vitality of businesses within the Walled City of Kano?**
☐5-Very high ☐4-High ☐3-Moderate ☐2-Low ☐1-Very low

22. **Are commercial spaces affordable in the Walled City of Kano?**
☐Yes, I agree ☐No, I do not agree ☐Maybe

23. **Are the basic amenities (such as utilities, groceries, and transportation) affordable in the Walled City of Kano?**
☐Yes, I agree ☐No, I do not agree ☐Maybe

24. **In terms of maintaining the Walled City of Kano's cultural identity, how would you rate the infrastructure as a whole (buildings, roads, etc.)?**
☐5-Very good ☐4-Good ☐3-Average ☐2-Poor ☐1-Very poor

25. **How would you rate the overall liveability of the Walled City of Kano?**
☐5-Very good ☐4-Good ☐3-Average ☐2-Poor ☐1-Very poor

Section D: Sustainable Urban Growth in the Walled City of Kano

26. **Do you have an idea of what sustainable urban growth is?**
☐Yes, I have a clear idea ☐I have a basic understanding ☐I am not sure
☐I have heard of it but do not know that much ☐No, I have no idea what it means

27. **Do you think there should be more efforts to ensure sustainable urban growth within the Walled City of Kano?**
☐Yes ☐No ☐Maybe

28. **In your opinion, which challenges do you think are preventing the Walled City of Kano from achieving sustainable urban growth? (*Choose all that apply).***

☐ Overcrowding ☐Inadequate infrastructure (water, electricity, roads, etc.)
☐ Environmental pollution ☐ Limited green spaces
☐ Inadequate waste management ☐ Socio-economic disparities
☐ Other (*please specify)* ……..

29. Which environmental strategies do you believe are most important for ensuring environmental sustainability within the Walled City of Kano? *(you can choose more than one)*

☐ Implementation of waste management programs
☐ Preservation and restoration of green spaces
☐ Promotion of energy-efficient infrastructure and renewable energy sources
☐ Regulation of industrial activities to minimize pollution

30. Considering the economic growth within the Walled City of Kano, which of the following aspects do you feel is most important for achieving sustainable urban growth?

☐ Promotion of local businesses and entrepreneurship
☐ Investment in infrastructure and public transportation systems
☐ Implementation of affordable housing initiatives
☐ Implementation of educational and vocational training opportunities

31. In terms of fostering social cohesion and inclusivity within the Walled City of Kano, which social aspects are essential for promoting sustainable urban growth?

☐Enhancing community engagement and participation
☐Ensuring access to quality healthcare facilities and services for all
☐Implementing programs to address poverty and income inequality
☐Preserving cultural sites and traditions

32. How would you rate the Walled City of Kano's efforts in ensuring sustainable urban growth while preserving its cultural identity?

☐5-Very good ☐4-Good ☐3-Neutral ☐2-Poor ☐1-Very poor

33. Do you agree with the adaptive reuse of traditional buildings way within the Walled City of Kano for modern uses to promote sustainable urban growth?

☐ Yes ☐No ☐Maybe

34. In your opinion, what measures do you believe would contribute most to sustainable urban growth in the Walled City of Kano? *(Select all that apply)*

☐Preservation of historical sites
☐Implementation of green spaces and parks
☐Enhancement of public transportation

☐Community engagement and empowerment

☐Improved infrastructure development

☐Promotion of sustainable architecture and urban design

35. What recommendations do you have regarding sustainable urban growth within the Walled City of Kano?

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Thank you for your participation! Your insights are invaluable in shaping the future of the urban environment within the historical walled city of Kano.

Appendix B

NEAR EAST UNIVERSITY

SCIENTIFIC RESEARCH ETHICS COMMITTEE

09.10.2024

Dear Ummulkalthum Wambai Mahmood
Your application titled **"Analysıng the Livability of Urban Area for Sustainable Urban Growth: The Walled City of Kano State, Nigeria"** with the application number NEU/AS/2024/220 has been evaluated by the Scientific Research Ethics Committee and granted approval. You can start your research on the condition that you will abide by the information provided in your application form.

Prof. Dr. Aşkın KİRAZ

The Coordinator of the Scientific Research Ethics Committee

Appendix C

Turnitin Similarity Report