USE OF ECO-CONSCIOUS DESIGN PRINCIPLES IN INTERIOR DESIGN OF STUDIO APARTMENTS AT KILIMANI IN NAIROBI

STUDENT NAME

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THIS PROPOSAL IS SUBMITTED IN PARTIAL FULFILMENT OF A DIPLOMA IN INTERIOR DESIGN AT KENYA COLLEGE OF INTERIOR DESIGN, NAIROBI

STUDENT DECLARATION

This proposal is my original work and has not been presented for a certificate or degree in any other university.

Signature_____ Date _____

Name: _____

Registration number: _____

Supervisor:

This proposal has been submitted for review with our approval as college supervisor:

Signature _____ Date _____

ACKNOWLEDGMENT

DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

AU	: African Union
KENCID	: Kenya College of Interior Design
UNEP	: United Nations Environmental Program
US	: United States

ABSTRACT

The adverse effects of climate change have demanded attention of all industry including the built environment industry. This main goal of this study is to examine the use of eco-conscious design principles in interior design of studio apartments at Kilimani in Nairobi. The specific objectives of the study will include toinvestigate the state of interior design in studio apartments at Kilimani in Nairobi; to examine the impact of eco-conscious design principles on the interior design of studio apartments at Kilimani in Nairobi and to propose an appropriate eco-conscious design model for enhancing interior design of studio apartments at Kilimani in Nairobi. The functionalism theory will be used to understand how the adoption of eco-conscious design could be used to enhance the functionality of studio apartments. The study will adopt a descriptive research design and will target tenants living in the studio apartments at Kilimani in Nairobi. A sample size of 384 respondents will be selected using systematic random sampling method. The questionnaire will be used to collect data, which will be analysed using Excel. The descriptive analysis will include outputs such as percentages and means and the results will be presented using tables, pie charts and bar graphs.

CHAPTER ONE: INTRODUCTION

1.1 Background of The Study

Interior design is the art and science of enhancing the interior of a space to achieve a healthier and more aesthetically pleasing environment for the people using it. It involves a blend of creativity, technical knowledge, and problem-solving skills to create functional and visually appealing spaces **(Brooker & Weinthal, 2013)**. Interior designers consider factors such as color, lighting, layout, furniture, materials, and spatial arrangement to optimize the functionality and aesthetics of a space while reflecting the client's preferences and needs (Stone & Hollis, 2022). Through careful planning and attention to detail, interior design transforms ordinary spaces into harmonious and inviting settings that improve the quality of life and well-being of occupants (Ching & Bingelli, 2018).

In the **United States**, residential interior design faces several challenges, including limited space in urban environments, adherence to building codes and regulations, and balancing aesthetics with functionality. Designers must also navigate diverse cultural preferences and lifestyle trends among homeowners. Sustainability concerns drive the need for eco-friendly materials and energy-efficient solutions, adding complexity to design choices **(Hick, 2022)**. In **South Africa**, residential interior design encounters unique challenges stemming from diverse cultural influences, economic disparities, and climatic variations across regions. Limited access to resources and skilled labor affects project feasibility and execution. Designers must address security concerns prevalent in many residential areas, incorporating measures without compromising aesthetics. Balancing traditional design elements with contemporary styles reflects the country's rich cultural heritage **(Ndovela & Olalere, 2023)**. In **Kenya**, residential interior design confronts several challenges. Limited access to quality materials and skilled labor affects design execution and project timelines. Economic disparities influence clients' budget constraints, often compromising design aspirations. Sustainability initiatives face obstacles due to inadequate infrastructure and inconsistent supply chains. Cultural diversity demands sensitivity and adaptability in design approaches to meet the preferences of diverse clientele **(Mungai & Ralwala, 2021)**. Therefore, this study will look at residential interior design in Kilimani in Nairobi and how it can be enhanced using eco-centered design.

Eco-centered design prioritizes environmental sustainability and minimal ecological impact throughout the design process. It aims to minimize resource consumption, reduce waste generation, and prioritize renewable materials and energy sources (Richards, 2017). Eco-centered design integrates principles of conservation, biodiversity preservation, and environmental stewardship to create products, buildings, and systems that harmonize with nature (Chias & Hernandez, 2022).

Eco-centered design is increasingly adopted across the globe to achieve construction sustainability. In the **UK**, eco-centered design principles are increasingly applied across various sectors such as architecture, urban planning, product design, and transportation. Initiatives include sustainable building certifications like BREEAM and Passivhaus, promoting energy-efficient housing and infrastructure. Additionally, eco-centered design influences product development emphasizing recyclable materials, energy efficiency, and reduced carbon footprint. Government policies also encourage eco-centered practices to mitigate environmental impact (Deutz et al., 2013). In **Egypt,** eco-centered design is increasingly recognized as a vital approach to address environmental concerns. Sustainable architecture projects prioritize energy efficiency, natural cooling, and renewable materials like adobe. Initiatives promote solar energy adoption, water conservation, and waste management strategies. Urban planning integrates green spaces and pedestrian-friendly designs to reduce pollution and enhance livability. Government policies and international collaborations drive awareness and implementation of eco-centered principles to mitigate environmental degradation and promote sustainable development nationwide (Bassioni et al., 2012). In **Keny**a, eco-centered design is emerging as a solution to environmental challenges. Initiatives focus on sustainable architecture, renewable energy, and waste management. Projects such as green building certification, solar energy adoption, and sustainable agriculture promote eco-friendly practices. Government support and community-driven efforts drive the integration of eco-centered design for a greener future (Chepkoech et al., 2023). This study will look at how eco-design principles can be used to enhance the interior design of studio apartments at Kilimani in Nairobi County.

Nairobi County, located in Kenya, is the country's capital and a vibrant economic hub in East Africa. It encompasses Nairobi City, known for its bustling streets, diverse population, and rich cultural heritage. The county hosts key government institutions, multinational corporations, and numerous financial centers (Onyango & Hyden, 2021). Nairobi is also renowned for its national

parks, including Nairobi National Park, where wildlife thrives amidst urban landscapes. The county faces challenges like traffic congestion, informal settlements, and environmental degradation, but ongoing initiatives focus on infrastructure development, sustainable urban planning, and community empowerment to ensure Nairobi remains a dynamic and resilient metropolis (Mutua & Wamalwa, 2017).

1.2 Statement of the Problem

Many studio apartments at Kilimani are not designed with sustainability in mind, and this has translated into to excessive energy consumption, waste generation, and environmental degradation. This endangers the health and well-being of the occupants of the apartment studios. The apartment studios do not have proper ventilation and air circulation systems, which leads to poor indoor air quality that is associated with health issues such as respiratory problems that the apartment occupants experience. The apartments are also located in areas with limited of green spaces and vegetation which contribute to a lack of connection to nature and limited opportunities for outdoor recreation by the occupants. This study will therefore, look at how eco-conscious design can be used to enhance the interior design studio apartments at Kilimani in Nairobi.

1.3 Objectives of the Study

1.3.1 General objective

To examine the use of eco-conscious design principles in interior design of studio apartments at Kilimani in Nairobi.

1.3.1 Specific Objectives

i. To investigate the state of interior design in studio apartments at Kilimani in Nairobi.
ii. To examine the impact of eco-conscious design principles on the interior design of studio apartments at Kilimani in Nairobi.
iii. To propose an appropriate eco-conscious design model for enhancing interior design of studio apartments at Kilimani in Nairobi.

1.4 Research Questions

i. What is the state of interior design in studio apartments at Kilimani in Nairobi?
ii. What is the impact of eco-conscious design principles on the interior design of studio apartments at Kilimani in Nairobi?

iii. What are the effective eco-conscious design principles for enhancing interior design of studio apartments at Kilimani in Nairobi? Or What is the most an appropriate eco-conscious design model for enhancing interior design of studio apartments at Kilimani in Nairobi?

1.5 Significance of the Study

Architects and Designers: Professionals in the field of architecture and interior design will benefit from the findings of the study by gaining insights into effective strategies and best practices for integrating eco-conscious design principles into studio apartment projects. They may incorporate these findings into their future projects, enhancing sustainability and environmental responsibility in their designs.

Developers and Real Estate Investors: Developers and investors involved in studio apartment projects in Kilimani and similar urban areas will benefit from the findings of the study by understanding the potential benefits of incorporating eco-conscious design principles. They can create more attractive and marketable properties by implementing sustainable design features, and potentially increasing rental or sale value while also reducing long-term operational costs.

Policy Makers and Urban Planners: Government officials and urban planners can use the findings of the study to inform policy decisions and urban planning initiatives related to sustainable development. The study will provide evidence-based recommendations for promoting eco-conscious design practices in building regulations and zoning ordinances, leading to more sustainable and resilient urban environments.

Academic and Research Communities: Scholars and researchers in the fields of interior design, architecture, environmental science, urban planning, and sustainability can benefit from the findings of the study as a basis for further research and exploration. The findings can contribute to academic discourse and knowledge advancement in the areas of sustainable design and urban development.

1.6 Scope of the Study /Delimitation

The study will be conducted at Kilimani area in Nairobi, Kenya. The study will look at interior design and design features present within studio apartments in this locality. The study will also involve an in-depth examination of eco-conscious design principles relevant to interior design. This will include aspects such as energy efficiency, utilization of sustainable materials, waste

management strategies, indoor air quality considerations, and the integration of natural light sources. The participants of the study will include current residents, developers, architects, and interior designers involved in construction and design processes. The study will be conducted between March and June 2024.

1.7 Limitations of the Study

The study will be limited by the size of the sample population, which could affect the generalizability of the findings to the broader Kilimani community. This will be addressed by using diverse sampling techniques to ensure representation from different demographic groups within the Kilimani community.

The study will be limited by the access to data about the research subject due to accessibility of the participants. This will be overcome by establishing collaboration with local organizations, academic institutions, and government agencies to facilitate access to the residents at the location.

The study will be limited by bias in stakeholder engagement, with certain groups being overrepresented or underrepresented in the study, leading to incomplete or misleading findings. This will be addressed by using participatory approaches where the residents' voices and perspectives are adequately represented in the study.

1.8 Assumptions of the Study

The study assumes that stakeholders, including residents, developers, and policymakers, are interested in promoting sustainability and are willing to engage in the study's objectives and recommendations.

The study assumes that implementing eco-conscious design principles will lead to positive outcomes, such as improved energy efficiency, enhanced indoor environmental quality, and increased resident satisfaction.

The study assumes existing policies and regulations related to urban development and building codes in Kilimani are conducive to the integration of eco-conscious design principles.

1.9 Definition of Terms

Eco-Conscious Design : the practice of creating products, buildings, systems, or processes that minimize negative environmental impacts while maximizing benefits to people and the planet.

Interior design : the art and science of enhancing interior spaces to achieve a functional and aesthetically pleasing environment.

Studio apartment : a small, self-contained living space typically consisting of a single room combining living, sleeping, and kitchen areas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature relevant for this study. The chapter will therefore, cover the empirical literature review, the theoretical framework and the conceptual framework.

2.2 Empirical Literature Review

2.2.1 Interior Design in Studio Apartments

Petermans & Pohlmeyer (2014) looked at how design could be used to promote subjective well-being in interior architecture. The study found that the design of inner environments can stimulate experienced, which provide pleasure and meaning to its residents. While Petermans & Pohlmeyer (2014) focused on the use of design to enhance well-being of interior inhabitants, the current study will specifically look at how eco-design can be used to make interiors of studio apartments more habitable.

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2.2.2 Impact of Eco-Conscious Design Principles on Interior Design

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2.2.3 Suggestions on Using Eco-Conscious Design model for Enhancing interior of Studio Apartments

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2.3 Theoretical Literature Review

The functionalism theory will be used in this study. The theory was proposed by Le Corbusier (1887–1965), a pioneer of modern architecture. The theory states that the that the design of a space should be primarily driven by its function or purpose, rather than solely by aesthetics or decoration. This theory will be applicable in my study in terms of understanding how the adoption of eco-conscious design could be used to enhance the functionality of studio apartments.

2.4 Conceptual Framework

This is a diagrammatic representation of your understanding of how your I.V relates or influences your D.V. e.g.

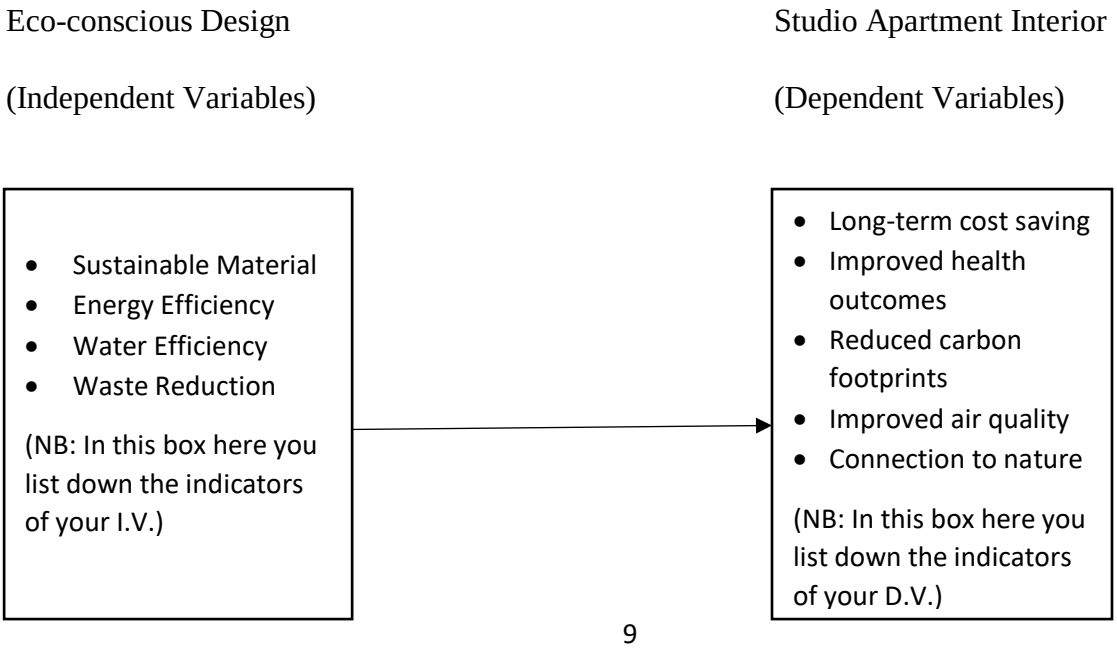

Figure 2.1: Conceptual Framework

2.5 Chapter Summary

This chapter discussed literature from past studies based on the objectives of the study. The chapter also discussed the functionalism theory, which was adopted for the study to help understand how the adoption of eco-conscious design could be used to enhance the functionality of studio apartments. Besides, the chapter presented the conceptual framework, which diagrammatically outlined how eco-conscious design relates with studio apartment interior design.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The methodology chapter outlined that plan and processes that will be used to collect data in the study. This will include a discussion of the research design, research site, research population, sampling design, data collection tools, data collection procedure and data analysis.

3.2 Research Design

The research design is the overall plan that outlines the process of data collection and analysis that will be used in a research study (Creswell & Creswell, 2018). The descriptive research design will be used in this study. Descriptive research design is a scientific method used to systematically collect and analyze data to describe, and interpret characteristics of a phenomenon or subject of study without influencing it in any way. The design is used in studies where the researcher is interested in describing and interpreting characteristics of research participants or describing how variables relate to one another in a study (Creswell, & Creswell, 2018). The descriptive research design will be relevant for this study since the researcher will seek to describe the relationship between eco-conscious design principles and interior design of studio apartments at Kilimani in Nairobi.

3.3 Research Site

A research site is a location where scientific studies, experiments, or investigations are conducted to gather data and information (Kothari, 2018). The research location for this study will be in Kilimani area in Dagoretti North sub-county in Nairobi County.

3.4 Research Population

A research population refers to the entire group that is the subject of a study and from which data is collected (Mugenda & Mugenda, 2003). The population of this study will include the tenants of the studio apartments in Kilimani areas in Nairobi County.

3.5 Sampling Design

3.5.1 Sampling Frame

A sampling frame is a list used to identify members of a population from which a sample will be drawn for research purposes (Mugenda & Mugenda, 2003). This study will not have a sampling frame due to the unavailability of a list of tenants in the studio apartments around Kilimani area in Nairobi County.

3.5.2 Sample Size

Sample size refers to the number of subjects or observations included in a research study or experiment to ensure statistical validity and reliability of the results (Creswell & Creswell, 2018). The sample size in this study will be determined by the formula suggested by Mugenda & Mugenda (2003).

$$n = \frac{Z^2pq}{d^2}$$

Where:

n = the desired sample size when the target population is more than 10 000.

z = the standard normal deviate at the particular recommended confidence level of 1.96

p = the proportion within the target population that is estimated to bear the characteristics that the study will measure (i.e. 50% or 0.5)

d = 1 – p and d is the set level of statistical significance (i.e. 0.05)

Therefore:

$$n = \frac{z^2pq}{d^2}$$

$$n = \frac{(1.96)^2\,(0.50)\,(0.50)}{(0.05)^2}$$

$$n = 384$$

Therefore, the sample size of the study will include 384 participants.

3.5.3 Sampling Method

Systematic sampling method will be used to determine the participants that will make up the sample size of the study. Systematic random sampling is a method of selecting individuals from a larger population in a systematic manner, such as every nth person, to create a representative

sample for research purposes (Creswell & Creswell, 2018). Notably, the nth in this case will include every 4th of the tenant in the studio apartments around Kilimani area. The data will, therefore, be collected in every 4th of the tenants until the 384 sample size of the study is realized.

3.6 Data Collection Tools/Instruments

The questionnaire will be used to collect data in the study. A questionnaire is a research instrument consisting of a series of questions designed to gather information from respondents. It can be in various formats, such as paper-based, electronic, or oral (Creswell & Creswell, 2018). The questionnaire will be used because it allows researchers to gather large amounts of data from a large number of people in a relatively short period (Creswell & Creswell, 2018). The questionnaire will be used to collect data such as the participants' demographic details including age, gender, and occupation. The questionnaire will also be used to collect opinions and attitudes of the respondents about the use of eco-design in the interior design of studio apartments.

3.7 Data Collection Procedures

The questionnaire in this study will be self-administered. In this method, respondents complete the questionnaire on their own without the presence of an interviewer (Creswell & Creswell, 2018). The questionnaire will be developed in Google Form and will thus be sent to the respondents electronically using mail or WhatsApp. Each questionnaire will be accompanied an introductory letter that will describe the study's objectives, the researcher's institutional association, and will seek permission to conduct the research while inviting respondents to participate. This letter will also emphasize the researcher's commitment to disclose the study's findings and will guarantee both anonymity and confidentiality. The participants will be given a duration of one week to respond to the questionnaires. Those who will not have responded to the questionnaires will be reminded via calls or SMS.

3.8 Data Analysis

The quantitative data collected in this study will be analyzed using Excel. The descriptive data will be in the form of percentages and mean and will be presented using tables, bar graphs and pie charts.

3.9 Chapter Summary

This chapter has presented the methodology that will be used in the study. The descriptive research design will be adopted in the collection and analysis of data. The study will be conducted at Kilimani area in Nairobi County and will target tenants living in studio apartments in the location.

A sample size of 384 respondents will be used and systematic random sampling method will be used to determine the participants to be included in the sample. The questionnaire will be used to collect data, which will be analysed using Excel and presented using tables, bar graphs and pie charts.

REFERENCES

Bassioni, H., El-Menchawy, A., & Mohamed, A. (2012, September 11). *Ecological Design Principles in Egypt: Case Study Application and Economic Evaluation*.

Brooker, G., & Weinthal, L. (2013). *The Handbook of Interior Architecture and Design*. A&C Black.

Chepkoech, R., Keitany, P., & Bett, A. (2023). Ecological Design Practice and Sustainable Performance of Multinational Tea Firms in Kenya. *East African Journal of Business and Economics, 6,* 442–255. https://doi.org/10.37284/eajbe.6.1.1496

Chias, P., & Hernandez, S. (2022). *Eco-Architecture IX: Harmonisation between Architecture and Nature*. WIT Press.

Deutz, P., Mcguire, M., & Neighbour, G. (2013). Eco-design practice in the context of a structured design process: An interdisciplinary empirical study of UK manufacturers. *Journal of Cleaner Production*, *39,* 117–128. https://doi.org/10.1016/j.jclepro.2012.08.035

Hicks, S. S. (2022). Interior Design: Living in Poverty and the Absence of Health, Safety, and Welfare. *Journal of Interior Design*, *47*(2), 3–10. https://doi.org/10.1111/joid.12214

Mungai, S., & Ralwala, A. (2021). *Sustainable Construction Transition: A Kenyan Interior Design Market Segment Perspective*.

Mutua, J. M., & Wamalwa, N. (2017). *Enhancing Mobilization of Own Source Revenue in Nairobi City County: Issues & Opportunities*. Institute of Economic Affairs.

Ndovela, X., & Olalere, F. E. (2023). Interior design social compact possibilities in tandem with industry realities in South Africa. *Cogent Arts & Humanities*, *10*(1), 2185445. https://doi.org/10.1080/23311983.2023.2185445

Onyango, G., & Hyden, G. (2021). *Governing Kenya: Public Policy in Theory and Practice*. Springer Nature.

Richards, M. A. (2017). *Regreening the Built Environment: Nature, Green Space, and Sustainability*. Taylor & Francis.

Stone, S., & Hollis, E. (2022). *Inside Information: The Defining Concepts of Interior Design*. RIBA Publishing.