

**The impact of poor construction building and the role of sustainable
architecture in case of Hargeisa city Somaliland.**



Hamse Faisal Ahmed

A Thesis Submitted to the Department of Architecture

The Collage of Civil Engineering and Architecture

Presented in Partial Fulfillment of the Requirement for the Degree of Master's in
Environmental Architecture

Office of Graduate Studies

Adama Science and Technology University

May, 2025

Adama, Ethiopia

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Prof. Ambuj Kumar (PhD)

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Adama, Ethiopia

DECLARATION

I hereby declare that this Master Thesis entitled “The impact of poor construction building and the role of sustainable architecture in Hargeisa, Somaliland” is my original work. That is, it has not been submitted for the award of any academic degree, diploma or certificate in any other university. All sources of materials that are used for this thesis have been duly acknowledged through citation.

Hamse Faisal Ahmed

Name of student

Signature

Date

RECOMMENDATION

I, the advisor(s) of this thesis, hereby certify that I have read the revised version of the thesis entitled “The impact of poor construction building and the role of sustainable architecture in Hargeisa, Somaliland” prepared under my guidance by Hamse Faisal Ahmed submitted in partial fulfillment of the requirements for the degree of

Masters of Science in Environmental Architecture. Therefore, I recommend the submission of revised version of the thesis to the department following the applicable procedures.

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APPROVAL SHEET

I, the advisors of the thesis entitled “The impact of poor construction building and the role of sustainable architecture in Hargeisa, Somaliland” and developed by Hamse Faisal Ahmed hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

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We, the undersigned, members of the Board of Examiners of the thesis by Abdirisak Hassan Abdi have read and evaluated the thesis entitled “Challenges and potential attributes of green building path based on sustainability in Hargeisa, Somaliland” and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in Environmental Architecture.

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ABSTRACT

This research investigates the critical impacts of poor construction and explores the transformative role of sustainable architecture in Hargeisa, Somaliland, a city experiencing rapid urbanization often accompanied by inadequate building practices. Employing a mixed-methods research design, the study utilized purposive sampling for selecting construction professionals and government officials, and random sampling for residents. Data was gathered through semi-structured interviews with diverse stakeholders including officials from government Ministry of Public Works and Housing, and the Ministry of Environment, local government bodies, representatives from private construction companies and professional organizations, alongside structured surveys with residents, and an analysis of relevant documents. Key findings reveal prevalent issues such as compromised safety, poor durability, and negative environmental consequences stemming from substandard materials, a lack of skilled labor, and weak regulatory enforcement. Despite these challenges, the research identified strong public support for sustainable architectural solutions, recognizing their potential for energy efficiency, resource conservation, and improved living conditions. However, significant barriers, including high initial costs, limited awareness, inadequate resources, and challenging government regulations, hinder widespread adoption. The study concludes by emphasizing the urgent need for multi-faceted interventions, including strengthening regulatory frameworks, enhancing technical capacity through training, raising public awareness, and fostering greater community involvement to integrate sustainable practices into Hargeisa's urban development, thereby promoting a safer, more resilient, and environmentally sound built environment.

Key words: Poor Construction, Sustainable Architecture, Environmental Impact, Urban Resilience, Policy Recommendations.

LIST OF ABBREVIATIONS

| | |
|-----------------|--|
| NGO | Non-Governmental Organization |
| PhD | Doctor of Philosophy |
| OPGS | Office of Postgraduate Studies |
| DGC | Department Graduate Council |
| SGC | School Graduate Committee |
| GIS | Geographic Information System |
| CADS | Computer-Aided Design Software |
| GBS | Goal-Based Standards |
| EPA | Environmental Protection Agency |
| UN | United Nations |
| ISO | International Organization for Standardization |
| LEED | Leadership in Energy and Environmental Design |
| CO ₂ | Carbon Dioxide |

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CHAPTER ONE

INTRODUCTION

1.1 Background

Hargeisa, the bustling capital of Somaliland, is a city that embodies a rich cultural tapestry and a spirit of resilience. As urbanization accelerates, the demand for housing and infrastructure has surged, leading to a construction boom. However, this rapid development has often been marred by poor construction design practices. Buildings that lack proper planning and adherence to safety standards not only jeopardize the structural integrity of the urban landscape but also threaten the well-being of residents. The consequences of such inadequacies are profound, ranging from economic burdens due to repairs and collapses to health risks arising from inadequate living conditions. In this context, the role of sustainable architecture emerges as a beacon of hope and transformation. Sustainable design principles advocate for resource efficiency, environmental responsibility, and community engagement. By integrating local materials, traditional construction techniques, and modern technologies, sustainable architecture can address the pressing challenges faced by Hargeisa. Furthermore, it can foster resilience against climate change, enhance the aesthetic appeal of the city, and preserve its cultural identity.

This introduction highlights the pressing need to address the shortcomings of construction practices in Hargeisa while emphasizing the potential of sustainable architecture to create a safer, healthier, and more sustainable urban environment. As Hargeisa continues to grow, embracing sustainable design will be crucial in shaping a future that honors both the city's heritage and its aspirations for development. Poor construction design in Hargeisa, Somaliland, has significant implications for both the environment and the socio-economic conditions of its residents. The lack of sustainable practices in building design leads to inefficient energy use, increased environmental degradation, and poor living conditions. Sustainable architecture offers a promising solution by integrating energy-efficient and environmentally friendly practices into building design, which can significantly improve the quality of life and environmental sustainability in the region. The following sections explore the impact of poor construction design and the role of sustainable architecture in Hargeisa.

Environmental Degradation Poor construction contributes to pollution and resource depletion, exacerbating local environmental issues (Goh et al., 2020).

Economic Inefficiency: Inefficient building practices lead to higher operational costs and maintenance issues, affecting the overall economic viability of structures (Yashchenko et al., 2024).

Social Implications Substandard buildings can create unsafe living conditions, impacting community health and well-being (Grierson, 2011)

Resource Efficiency Sustainable architecture emphasizes the use of renewable materials and energy-efficient designs, which can significantly reduce waste and operational costs (Dhruv Sai Reddy, 2023)

Innovative Techniques Techniques such as rammed earth and eco-friendly materials can be employed to enhance building durability and reduce environmental footprints (Dhruv Sai Reddy, 2023).

Long-term Benefits While initial costs may be higher, sustainable practices lead to lower energy consumption and maintenance costs over time, ultimately increasing property value (Yashchenko et al., 2024).

1.2 Problem Statement

Hargeisa, the capital of Somaliland, has seen rapid urbanization and population growth, but this expansion has led to significant challenges due to poor construction design and inadequate urban planning. Many buildings lack adherence to engineering standards, resulting in structural failures and unsafe living conditions, while also contributing to environmental degradation through increased energy consumption and resource overuse. The city faces climate-related hazards, such as heat waves and water scarcity, exacerbated by unsustainable construction practices. Despite the potential benefits of sustainable architecture—such as energy efficiency and the use of eco-friendly materials—there is limited awareness and implementation of these principles in Hargeisa. The absence of regulatory frameworks and technical expertise has hindered progress in developing durable, environmentally responsible buildings. This research aims to document the challenges of poor construction design in Hargeisa, promote awareness of sustainable architecture, and provide insights for policymakers to encourage sustainable construction practices, ultimately supporting the city's long-term resilience and environmental sustainability

1.3 Objectives of the study.

1.3.1 General objective

The general objective of the study evaluates the impact of poor construction building and the role of sustainable architecture in case of Hargeisa Somaliland city.

1.3.2 Specific objectives

- To assess the impact of poor construction building on safety, durability, design, and functionality in Hargeisa, Somaliland.
- To analyze the economic and social implications of poorly designed buildings on residents and the city's development.
- To explore the potential of sustainable architecture in addressing the challenges associated with poor construction design in Hargeisa.

1.4 Research questions

1. What are the critical impacts of prevailing poor construction practices on the overall building performance (encompassing safety, durability, and functional) in Hargeisa?
2. What are the primary socio-economic consequences of widespread poor construction for both the residents and the urban development trajectory of Hargeisa?
3. To what extent can sustainable architectural principles and practices offer viable solutions to mitigate the negative impacts of poor construction and contribute to more resilient and liveable urban development in Hargeisa?

1.5 Significance of the study

This study is significant as it aims to establish a framework for Hargeisa to evolve into a safer, healthier, and more sustainable urban landscape. Ultimately, this research aims to establish a framework for future development, ensuring Hargeisa evolves into a safer, healthier, and more sustainable urban landscape. Specifically, the significance of the study unfolds as follows:

1.5.1 Significance for the City Administration of Hargeisa

The study provides the city administration of Hargeisa with tangible insights and practical recommendations for addressing deficiencies in current building practices, thereby enhancing the safety and resilience of the city's residents against potential hazards.

It offers strategies for promoting healthier living conditions through sustainable design, contributing to the improvement of public health outcomes.

It supports informed urban planning and the management of rapid urban growth, including climate change adaptation and the preservation of natural resources, while also aiding in maintaining the city's cultural identity and promoting community engagement.

1.5.2 Significance for Policy Makers

The study's findings provide policymakers with valuable, evidence-based insights that facilitate the development, review, and enforcement of robust construction policies, building codes, and environmental regulations supporting sustainable urban growth.

It identifies barriers to sustainable construction and suggests policy interventions, including potential incentives to encourage the adoption of sustainable practices, thereby fostering economic benefits.

1.5.3 Significance for the Scientific Community

The study contributes empirical data and context-specific knowledge to the academic discourse on sustainable architecture, construction practices, and urban development in rapidly urbanizing, data-scarce regions like Somaliland.

It offers a case study (Hargeisa) that can be used for comparative analysis and the development/testing of theories in urban studies and sustainable development.

It presents a methodological approach (mixed-methods) that may be adapted for research in similar contexts.

1.5.4 Significance for Future Researchers

The study provides a foundational basis and baseline data that can guide subsequent research on construction, urban planning, and sustainability in Hargeisa.

It identifies specific areas and further research questions that require future investigation within the local context and beyond.

The study's findings and methodology can serve as a reference point for researchers undertaking similar studies in other developing cities facing comparable challenges.

1.6 Scope of the study

The scope of this study on construction building and sustainable architecture in Hargeisa is defined by several key parameters. The study specifically examines the unique challenges and opportunities in Hargeisa related to local construction practices.

1.6.1 Thematic Scope

The thematic scope of the study focuses on a comprehensive examination of Hargeisa's construction sector and the potential of sustainable architecture. It involves analyzing current local construction practices, including methods, materials, and design approaches utilized, while also identifying and assessing deficiencies in building safety and structural integrity, and the health implications of inadequate construction. Furthermore, the research explores the benefits of sustainable architecture for enhancing living conditions and mitigating environmental impact, incorporating diverse stakeholder perspectives from builders, architects, urban planners, residents, and policymakers to ensure a holistic understanding of the issues and opportunities

1.6.2 Spatial Scope

The study spatially focuses specifically on Hargeisa, the capital of Somaliland. Furthermore, the research conducted in-depth investigations in specific neighborhoods within Hargeisa, such as the '26 June' district, to obtain a detailed understanding of the issues at a local level.

1.6.3 Temporal Scope

The study temporally concentrates on the current state and contemporary practices related to construction and sustainable architecture in Hargeisa. The data collected reflects the situation during the period of the research, culminating in the completion of this study in 2025 . Consequently, the findings and conclusions are particularly relevant to this recent period and prevailing conditions.

1.7. Limitations of the Study

This study provides valuable insights into the state of construction and the potential role of sustainable architecture in Hargeisa; several limitations must be acknowledged. The reliance on questionnaire responses as the primary data source introduces the potential for respondent bias or misinterpretation of questions. Although the response rate was high (92.5%), the relatively small sample size of 111 participants may not fully capture the diverse perspectives across the city, particularly as the study focused primarily on urban areas. Furthermore, time and resource constraints limited the scope of data collection, precluding site observations and more in-depth investigations. Challenges were also encountered in accessing official information and securing collaboration with government institutions. These limitations should be considered when interpreting the findings; however, the study still provides a robust foundation for understanding.

CHAPTER TWO

LITERATURE REVIEW

2.1: Overview of Literature Review

Literature review is consisting of theoretical and empirical literary reviews. The difference between in theoretical literary review talks about discussion about theory and different experts' thoughts on those theories and your own thoughts on the theory while empirical literary reviews is the findings of original research such like; a surveys, studies, scientific experiments and academic stands. Both is a systematic analysis of existing secondary sources to provide the historical overview of the topic; this chapter of the study literature review offers background information about the impact of poor construction building and the role of sustainable architecture. It addresses the theoretical and empirical literature concerning about impact of poor construction and potential of sustainable architecture. This research would be useful in resolving the problems and would be a design analysis to improve existing poor construction building in various Somaliland cities. Under this page, the various revived papers and literatures are briefly explained as below in the theoretical and empirical sections of the sub-topics below.

Design Errors Inadequate planning can result in structural failures, leading to safety hazards and increased repair costs (Abdillahi et al., 2024a).

Inadequate Detailing Poor detailing can compromise the integrity of buildings, necessitating costly modifications (Akadiri et al., 2012).

Lifecycle Costs Neglecting maintenance considerations can inflate long-term operational costs, impacting overall project sustainability (Thomas et al., 2023).

Resource Conservation Sustainable practices emphasize efficient resource use, reducing waste and environmental impact (Akadiri et al., 2012).

Economic Benefits: Initial investments in sustainable construction can lead to long-term savings and job creation (Rahmanivahid et al., 2024) .

2.2. Theoretical Literature Review

2.2.1 Global manifestations of substandard construction in urban environment

The global manifestations of sub standard construction in urban environments reflect a complex interplay of geological, ecological, and infrastructural factors. As urbanization accelerates, the integration of subsurface elements into urban planning becomes crucial for sustainable development. This response will explore the significance of subsurface studies, the role of three-dimensional urban structures, and the impact of green infrastructure on urban ecosystems.

The incorporation of subsurface data is essential for effective urban planning, as it reveals geological attributes and human impacts on the environment (Otón et al., 2021).

Collaboration between geological institutes and urban planners is necessary to utilize subsurface information for sustainable urban management.

The global dataset on three-dimensional urban structures indicates a shift towards vertical land use, with building volumes increasing significantly from 1985 to 2015 (Liu et al., 2025),

This trend highlights the need for equitable distribution of building space, particularly in densely populated cities, to address urban inequality.

Urban green infrastructure is vital for mitigating pollution and enhancing urban health, providing ecosystem services that support biodiversity and human well-being (Miakhel et al., 2024),

The integration of green spaces into urban design can counteract the negative effects of urbanization on natural ecosystems (McKenzie, 2020),

2.2.2 Foundation of building safety and performance stander

The foundation of building safety and performance standards is multifaceted, encompassing structural integrity, safety management systems, and regulatory frameworks. These elements work together to ensure that buildings not only meet safety requirements but also perform effectively under various conditions. The following sections outline the key aspects of this foundation.

Structural design standards are essential for addressing safety and serviceability issues, providing a framework for rational engineering practices (Ellingwood, 2001).

Reliability indices, derived from traditional practices, guide the design process, although they may not always reflect historical failure rates (Ellingwood, 2001).

Innovative designs, such as high-performance foundation pit protection systems, enhance stability and safety during construction (Liu et al., 2025).

Effective safety management systems are crucial for achieving world-class safety performance, as they are more indicative of safety outcomes than accident statistics alone (Barrantes et al., 2018),

The success of these systems is influenced by the organization's safety culture, which drives compliance and overall safety performance (Barrantes et al., 2018).

A strong correlation exists between quality practices in foundation construction and safety performance, suggesting that improving quality can enhance safety outcomes ((Bulbaai & Halman, 2024).

2.2.3 Impacts of construction building and urban environment in Hargeisa.

The impacts of construction quality and the urban environment in Hargeisa are multifaceted, influencing both economic sustainability and public health. Effective construction site management is crucial for minimizing risks and ensuring project success, yet significant shortcomings in these practices have been identified in Hargeisa, leading to inefficiencies and increased costs (Abdillahi et al., 2024a). Additionally, the quality of the urban environment directly correlates with economic development, as improvements in urban infrastructure can enhance the overall economic stability of the region ((Joint Stock Company «Institute of Regional Economic Research», Moscow, Russian Federation & Zvorykina, 2024),.

Ineffective management practices lead to increased rework, defects, and delays.

A study identified 15 key management items inadequately performed, necessitating improved procedures for sustainability (Abdillahi et al., 2024a).

The state of urban improvement is a direct indicator of economic growth.

Enhancements in urban infrastructure can stimulate local economies and improve living conditions (Joint Stock Company «Institute of Regional Economic Research», Moscow, Russian Federation & Zvorykina, 2024).

Poor waste management practices contribute to environmental degradation and public health issues.

Current landfill sites in Hargeisa are inadequate, necessitating urgent reevaluation of waste management strategies (Abdillahi et al., 2024a).

2.2.4 Challenge and opportunity for sustainable construction in Hargeisa.

Sustainable construction in Hargeisa presents both significant challenges and opportunities. The construction industry in this region faces inefficiencies in site management, which hinder project completion and sustainability efforts. However, there is potential for improvement through the adoption of sustainable practices and technologies.

Ineffective Site Management: A study highlighted that construction site management practices in Hargeisa are often inadequately performed, leading to increased costs and project delays (Abdillahi et al., 2024a).

Barriers to Adoption: Factors such as organizational, social, technological, and legal challenges impede the implementation of sustainable practices, despite the availability of green materials (Galbur, 2025) (Tjebane et al., 2023).

Lack of Regulation: The absence of robust regulations and building standards further complicates the integration of sustainability in construction projects (Tjebane et al., 2023).

Enhanced Management Practices: Implementing improved site management procedures can significantly enhance project efficiency and sustainability outcomes (Abdillahi et al., 2024b)

Emerging Technologies: The integration of smart technologies and decision-making mechanisms can facilitate sustainable construction practices, providing a pathway for innovation (Zavadskas et al., 2021).

Contractor Engagement: Expanding the role of contractors in sustainability efforts can lead to more effective project delivery models that prioritize long-term environmental impacts ((Jarrah & Siddiqui, 2012).

2.3. Empirical

2.3.1 Documented impacts construction global, case study

Poor construction practices have significant global impacts, affecting economic, environmental, and social dimensions. These impacts are often exacerbated by inadequate project management, design errors, and environmental neglect. The consequences of poor construction are far-reaching, leading to project delays, cost overruns, and environmental degradation. This answer explores the multifaceted impacts of poor construction practices through various case studies and research findings.

Construction delays and cost overruns are prevalent issues that lead to economic downturns and employment losses. Poor project management and inadequate planning are primary contributors to these delays, which discourage foreign investment and reduce industry performance (Latif, 2023) (Iqbal et al., 2024).

Globalization has introduced volatility in construction tender prices, with an average increase of 49.7% per annum in some regions. This volatility can lead to unfair competition and the collapse of local firms, further destabilizing economies (Tembo et al., 2023).

Construction activities significantly impact the environment, contributing to resource depletion, biodiversity loss, and pollution. Noise, dust, and waste are major environmental concerns associated with construction projects (Barrantes et al., 2018) (Anwar et al., 2024).

Environmental impact assessments (EIAs) are crucial for mitigating these effects, yet compliance with environmental procedures varies, indicating a need for more integrated evaluation protocols(Barrantes et al., 2018).

Poor construction practices can lead to adverse social outcomes, including decreased productivity and negative health effects. The construction industry must adopt sustainable practices to mitigate these impacts (Barrantes et al., 2018).

The presence of foreign firms in developing countries can lead to social issues, such as corruption and the marginalization of local businesses, necessitating improved procurement controls and capacity building for local firms (Tembo et al., 2023).

2.3.2 Empirical evidence on Socio-Economic of construction building in Hargeisa

The socio-economic impacts of construction in Hargeisa are multifaceted, influencing both the local economy and community dynamics. The construction sector, particularly road projects like the Berbera Corridor, plays a crucial role in enhancing connectivity and economic stability. However, challenges such as inadequate site management practices and public infrastructure deficits hinder optimal outcomes. The following sections elaborate on these aspects.

Construction projects generate employment opportunities, contributing to local economic growth.

Infrastructure Development: Projects like the Berbera Corridor improve transportation, reducing travel time and enhancing trade opportunities (“Influence of Socio-Economic Factors on Performance of Road Construction Projects,” 2024).

Revenue Generation: Effective land and property taxation can bolster local government revenues, facilitating further urban development (Nyirakamana et al., 2024).

Community Disruption: Construction can lead to temporary relocations and business income loss due to road closures and noise (El-Sayed & El-Anwar, 2015).

Health and Safety Concerns: Increased accidents and environmental safety issues are prevalent during construction phases (“Influence of Socio-Economic Factors on Performance of Road Construction Projects: A Case of Berbera Corridor Road Section between Hargeisa and Berbera”, 2024).

Site Management Inefficiencies: Poor site management practices have been identified, leading to delays and increased costs (Abdillahi et al., 2024c).

2.3.3 Effectiveness's and applications of sustainable architecture, international.

Sustainable architecture has emerged as a critical response to environmental challenges, emphasizing eco-friendly practices and materials in building design. This approach not only addresses ecological concerns but also enhances the quality of life for occupants. The effectiveness and applications of sustainable architecture can be observed through various international practices and principles that guide its implementation.

Sustainable architecture seeks harmony with the natural environment, utilizing materials and designs that minimize ecological impact (Obinna Iwuanyanwu et al., 2024).

Energy Efficiency: Techniques such as solar photovoltaic systems, efficient lighting, and ventilation are integral to reducing energy consumption and carbon emissions (Chen, 2025).

The design prioritizes the physical and spiritual well-being of occupants, creating healthier living and working spaces (Chust, 2014) (Chen, 2025).

Countries across the USA, Europe, and Asia have adopted green building techniques, showcasing diverse applications of sustainable architecture ((Ename Minko, 2025).

Research and development buildings exemplify the application of sustainable principles, enhancing urban planning and energy efficiency (Kazan State University of Architecture and Engineering et al., 2023)& (Kazan State University of Architecture and Engineering et al., 2023).

2.3.4 Observed barriers and success factors in implement in sustainable construction

The implementation of sustainable construction faces various barriers and success factors across different regions. Key barriers include financial constraints, lack of education, and resistance to change, while success factors often revolve around commitment, policy support, and technological availability. Understanding these dynamics is crucial for advancing sustainable practices in the construction industry.

High initial costs and ongoing expenses deter investment in sustainable practices (Abu Bakar et al., 2018) (Namian et al., 2021).

Lack of Education: Insufficient sustainability education in academic institutions leads to a workforce unprepared for sustainable practices (Toriola-Coker et al., 2021).

Resistance to Change: Cultural inertia and prioritization of traditional methods over sustainable approaches hinder progress (Toriola-Coker et al., 2021).

Governmental Barriers Inadequate policies and regulations fail to incentivize sustainable construction (On & Techapeeraparnich, 2021).

A strong commitment from stakeholders to adopt sustainable practices is essential (Abu Bakar et al., 2018).

Policy Implementation Effective government policies can facilitate the transition to sustainable construction (Abu Bakar et al., 2018).

Technological Availability: Access to advanced technologies and materials supports the implementation of sustainable practices (Abu Bakar et al., 2018).

2.4. Research gap

Despite the recognized pressing challenges of poor construction building and inadequate urban planning in Hargeisa, and a general understanding of sustainable architectural principles, there is a notable lack of context-specific empirical evidence pertaining to Hargeisa's unique situation.

While Hargeisa's construction challenges and rapid urbanization are broadly acknowledged, a critical research void exists concerning local empirical data. This gap encompasses a lack of specific evidence on urbanization's impacts on building performance and the environment, limited understanding of stakeholder views on sustainable design, under-explored effects of regulatory and skills deficits, and an absence of comprehensive studies on implementing sustainable architectural practices within the city. This overall deficiency in Hargeisa-specific empirical research hinders the formulation of targeted, evidence-based solutions for sustainable urban development.

CHAPTER THREE

METHODOLOGY

3.1: Introduction

In this chapter, the research methodology in the present study is discussed. It comprises of the research design, research approaches, study population, data collection and analysis strategies employed to answer the research questions. The methodology employed in the present study was mixed approaches, where sources of the data collected from both primary and secondary sources. The tools used for statistical analysis is SPSS, MS-Excel would employ for data analyses.

3.2: Study Area

This research examines Hargeisa, specifically the 26 June district, because of its one of the first established district Area and holds significant historical importance, contributing to the overall development of Hargeisa, that containing four villages However, many buildings in this area are aging and in poor condition, raising concerns about their structural integrity and the potential risk of collapse. Such deterioration poses safety threats to residents and impacts the community socially and economically. Preserving these historical structures is essential for maintaining cultural heritage and community identity. And also living most densely populated area in the city, featuring a mix of commercial markets and essential government institutions that support the local economy.

The study will analyze key entities involved in the district's development, including the Ministry of Public Works and Reconstruction, which oversees construction standards and infrastructure projects. That was investigated their efforts to promote sustainable building practices amid rapid urbanization.

Additionally, the Ministry of Environment was be explored for its role in ensuring environmental sustainability by regulating construction practices and fostering eco-friendly awareness among stakeholders, including builders and the local community.

The local government's policies affecting urban planning and community development will also be analyzed, focusing on their impact on construction practices and stakeholder

engagement. Furthermore, the study was assessing local construction companies, examining their practices, challenges, and willingness to adopt sustainable methods.

Overall, the research aims to provided actionable insights and recommendations to improve construction practices in the 26 June district.

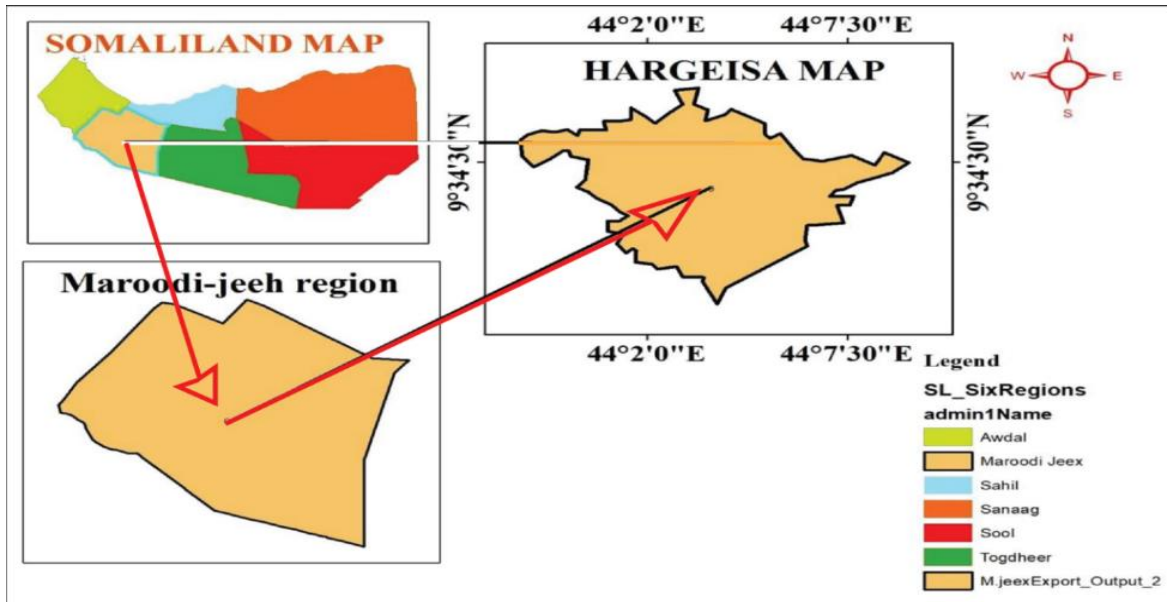


Figure 1 location map of Hargeisa, Somaliland

3.3: Research Design

This study utilized a descriptive and exploratory research design with a mixed-methods approach to investigate the impact of poor construction building practices and the role of sustainable architecture in Hargeisa, Somaliland. The research combines quantitative methods and qualitative methods to comprehensively analyze the issue. The study focuses on identifying the causes and consequences of poor construction, examining its environmental, social, and economic impacts, and exploring sustainable architecture as a potential solution.

This study employed a mixed type of methods. The first part of the study was consisted of a series of well-structured questionnaires and semi-structured interviews with key stakeholders (Government officials like, Mayer of Hargeisa in local governmental, and director of Ministry of Public Works and Housing and the ministry of environmental). Secondary data is obtained from government reports, academic literature, and case studies. A purposive sampling technique is used to select experts, while random

sampling ensures diverse representation of residents. Data analysis integrates quantitative tools (e.g., Excel for statistical analysis) and qualitative thematic analysis to identify patterns and insights.

Ethical considerations, including informed consent, confidentiality, and cultural sensitivity, are respected throughout the research. Despite limitations such as time constraints and access to secondary data, the study provides a structured framework to examine construction challenges and explore actionable recommendations for adopting sustainable architecture in Hargeisa.

3.4: Data Collections procedures

Both qualitative and quantitative data were collected from primary and secondary sources. Information including the knowledge, attitude and practices of households and stakeholders had gathered from primary sources. Relevant secondary information was also be compiled from documents. The detail data collection methods were discussed below.

3.4.1: Primary Data Collection Methods

Primary data sources were qualitative and quantitative. The qualitative sources were field observation, interview form institution concerning research study; while that of the quantitative data sources were collected for distributed structured questionnaires to obtain appropriate information form household respondents.

3.4.2: Secondary Data Collection Methods

The secondary data refers to data that was collected by someone other than the user. This data sources insights of the research area of the current state-of-the-art method. It also some sort of research gap that needs to be fills by researcher. This secondary data sources could be internal and external data sources. This study, the secondary data was gathered from different documents, mainly the impact of poor construction building challenges and sustainable architect reports, rapid urbanization reports, manual reports, assessments and manual of the Agency.

3.5: Data Collection Tools

In this research study was used close and open-ended questionnaire, semi-structured interview, and structured field observation for methods to collect relevant and adequate information from different sources.

3.5.1: Questionnaire

The respondents of questionnaire had given sufficient time to give responses carefully to promote their freedom in giving response. A regular follow up of the questionnaire was maintained to enhance the response rate. Researcher was used a questionnaire to collect information required for households.

3.5.2: Structured Interview

Interview method of data collection was deployed to enquire information from the higher officials and managers such as had of municipality, director of Ministry of Public Works and Housing. Phone and Zoom video calling methods of interview were applied due to coronavirus issue. An interview guide was prepared first; followed by passing questions to interviews.

3.5.3: Field Observation

observed the real time situations prevailing in the study area; the researcher could get real information about the study problem. This was very much useful to obtain the current practices of the impact of poor construction building in the study area which it aided by photos to identify the problems. The third data gathering methods had been used in the area of some residential, areas was structured field observation had conducted.



Figure 3 Ministry of environmental Hargeisa



Figure 2 Daryeel construction com Hargeisa

3.6: Sample Design and Methods

The two main approaches in sample design are probability sampling and nonprobability sampling approaches. In case of this study, the researcher used both probability and nonprobability sampling due to nature of research and data collection tools. Particularly purposive sampling and simple random sampling were operative in the study to select key informant, comprising various households and Organizations those involve the urban construction services The reason for purposive sampling technique was the judgment of the researcher based on who can provide the relevant data for the study specially the officials and household study.

3.6.1: Sample Population

The sample population for this study primarily consisted of individuals and stakeholders who were directly or indirectly involved in construction activities and urban development within specific areas of Hargeisa, Somaliland. The research was geographically focused on the 26 June District, a key administrative district located in the northern part of Hargeisa.

Within the 26 June District, the researcher purposively selected 26june district to facilitate an in-depth investigation into the core issues associated with the impact of substandard construction practices. The rationale for selecting the 26 June District, which includes these four villages, was to enable a focused comparison and a deeper understanding of the severity of the impacts caused by poor construction and urbanization. According to a 2015 report by the Hargeisa Municipality, the 26 June District had a residential population of 20,294. The

study further concentrated on areas within these villages that were identified as having significant issues related to poor building construction, with an estimated total of 365 such units across the four villages.

Consequently, participants for this study were drawn from residents living in these identified areas of poor construction within the district. Additionally, the study included construction professionals, government officials, private construction companies, and other relevant stakeholders involved in urban development and construction practices within these specific locations.

Table 1 Districts of household estimates.

| 26 June district | Households estimate |
|-------------------------|----------------------------|
| Daloodho | 70 |
| Downtown | 65 |
| Idaacada | 80 |
| Shacabka | 150 |
| Total | 365 |

3.6.2: Sample frame

the sample frame of this study included a comprehensive list of potential participants categorized by stakeholder groups to provide a well-rounded understanding of construction practices in Hargeisa. It featured residents from various neighborhoods, ensuring representation across different socio-economic backgrounds, with eligibility criteria requiring them to have lived in the area for at least one year and to have relevant experiences with construction quality. The second group consisted of construction professionals, including registered architects, engineers, licensed contractors, and representatives from NGOs focused on housing and urban development. The final category included government officials and policymakers from departments related to urban planning, housing development, and environmental protection, particularly those involved in construction regulations. This structured sample frame aimed to capture diverse perspectives on current

construction practices, their impacts, and opportunities for sustainable architecture in Hargeisa, thereby enriching the study's findings and recommendations.

3.6.3: Sample Unit

The sample unit for this study consists of individual participants from three key stakeholder groups in Hargeisa, Somaliland. First, residents were providing insights into their experiences with poor construction practices and awareness of sustainable solutions. Second, construction professionals, including architects, engineers, contractors, and workers, will share their expertise on current practices and sustainability feasibility. Lastly, government officials and policymakers from urban planning, housing, and environmental departments was offering perspectives on existing policies and regulations. This approach ensures diverse viewpoints and experiences related to construction quality and sustainable development are captured effectively.

3.6.4: Sampling Techniques

To ensure a comprehensive and representative collection of perspectives for this study, a combination of purposive and random sampling techniques was employed. Purposive sampling was utilized for the selection of construction professionals and government officials. These individuals were chosen based on their specific expertise and direct involvement in the construction and urban development sectors within Hargeisa. This targeted approach facilitated the inclusion of knowledgeable participants capable of providing in-depth insights into current construction practices and existing policy frameworks. Conversely, random sampling was applied to select residents. This method ensured that individuals from diverse socio-economic backgrounds and various neighborhoods within the study area were represented, thereby broadening the range of experiences captured. The adoption of this mixed-method sampling strategy was instrumental in enhancing the diversity of perspectives gathered, which in turn supported a more robust analysis of the challenges and opportunities associated with construction quality and sustainable development in Hargeisa

3.6.5: Sample Size

The study involved 120 participants from various stakeholder groups to ensure balanced representation on construction quality and sustainable development in Hargeisa. This included 45 construction professionals, recruited through purposive sampling, who provided insights on technical practices, efficiency improvements, and environmental impacts. Additionally, 20 government officials from the Ministry of Environment contributed perspectives on regulatory frameworks and sustainability initiatives, highlighting challenges with compliance and green building standards. Furthermore, 20 participants from the Ministry of Public Works and Housing discussed infrastructure standards, emphasizing alignment with community needs and the role of infrastructure in enhancing residents' quality of life. Twenty local government officials offered insights on urban planning and community development, stressing the need for integrated approaches that balance economic growth with environmental sustainability. Finally, 15 residents of the 26 June neighborhood shared their experiences of the negative impacts of poor construction. This diverse representation facilitated a comprehensive dialogue on the social impacts of construction practices, aiming to inform recommendations for more sustainable urban development in Hargeisa.

The study suggests using the Yamane formula for sampling from a targeted population.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = the required sample size
- N = the total household size
- e = the level of precision or margin of error

For the purpose of this study, the target household (N) was identified as 365, representing the "Total poor house building of four selected from the district.

A margin of error (e) of 7.5% (or 0.075) was deemed appropriate for this research.

The calculation was performed as follows:

1. Square the margin of error: $e^2 = (0.075)^2 = 0.005625$
2. Multiply the population size by the squared margin of error:
 $N(e)^2 = 365 \times 0.005625 = 2.053125$
3. Add 1 to this product: $1 + N(e)^2 = 1 + 2.053125 = 3.053125$
4. Divide the total population by this sum: $n = \frac{365}{3.053125} \approx 119.55$

This result was rounded up to a required sample size of $n=120$ participants.

3.7: Method of Data Analysis

The method of data analysis for this study was involve a combination of qualitative and quantitative approaches to effectively interpret the gathered insights. Qualitative data, obtained from interviews and open-ended survey responses, will be analyzed using thematic analysis to identify key patterns and themes related to construction practices and sustainability perceptions. This approach was allowed for an in-depth understanding of participants' experiences and viewpoints. Quantitative data, collected through structured surveys, to analyzed using statistical methods to summarize and quantify trends, relationships, and differences among the stakeholder groups. Descriptive statistics, such as frequencies and percentages, was employed to summarize demographic information and responses, while inferential statistics may be used to assess correlations and differences between groups. This mixed-methods approach was provided a comprehensive understanding of the issues at hand, facilitating effective recommendations for improving construction practices and promoting sustainable development in Hargeisa.

3.8: Operational Framework

Table 2 Districts of household estimates.

| Research Objectives | Variables | Method of Data Collection |
|--|--|---|
| To assess the impact of poor construction building on safety, durability, design, and functionality in Hargeisa, Somaliland. | Construction quality | Questionnaire, structured interview and field observation |
| To analyze the economic and social implications of poorly designed buildings in Hargeisa | Awareness of Sustainability Awareness of Sustainability | Questionnaire structured interview field observation |
| Analyze the socio-economic status of residents | Socio-Economic Status | Questionnaire structured interview field observation |

3.9: Data Analysis and Presentation

When data collection of the research study completes. In the study both quantitative and qualitative of data analysis was used in the investigation part. The data was collects form questionnaire, structured interview and field observation then was analysis in quantitatively and qualitatively approach. The researcher was analysis the research data collected by different methods and present clear information about it; in terms of frequencies, percentages, field photo, words or thematic graphs, tables and charts.

3.10: Limitation of the Study

The study acknowledges several limitations that may affect its findings and their broader applicability. A primary concern is the potentially unrepresentative sample size, which could introduce data biases. Additionally, the reliance on self-reported survey and interview data raises the risk of response bias. The cross-sectional design of the study restricts the ability to infer causality or observe changes over time. Resource constraints may have limited the depth of qualitative data collection, and external factors, such as political or economic instability during the research period, could have influenced participant responses and the overall context of the study.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1. Introduction:

This chapter, Chapter Four, meticulously presents and analyzes the findings from the data collection phase of this research concerning "The impact of poor construction building and the role of sustainable architecture in Hargeisa city Somaliland". As detailed in Chapter Three, this study employed a mixed-methods research design, integrating both quantitative and qualitative data to achieve a comprehensive understanding of the research problem.

Primary data were carefully gathered through several methods. Structured questionnaires were administered to residents of Hargeisa, particularly within the 26 June district, to capture their experiences and perceptions regarding construction. In-depth semi-structured interviews were conducted with key informants, including officials from the Ministry of Public Works and Housing, the Ministry of Environment, and local government bodies, as well as with construction professionals and representatives from private construction companies. Furthermore, field observations were undertaken in selected residential areas to gain direct insights into current construction practices and their impacts. In addition to these primary sources, secondary data were compiled from relevant government reports, academic literature, and case studies to contextualize the findings.

The quantitative data obtained from the questionnaires were analyzed using statistical tools, including SPSS and MS-Excel, to generate descriptive statistics such as frequencies and percentages. Qualitative data derived from interviews and field observations were subjected to thematic analysis to identify key patterns and emergent insights

4.2. DEMOGRAPHIC PROFILE OF RESPONDENTS

Table 3 Age Distribution of Respondents

| Age Group | Frequency | Percentage |
|------------------|------------------|-------------------|
| 18–24 | 27 | 24% |
| 25–34 | 75 | 68% |
| 35–44 | 9 | 8% |
| Total | 111 | 100% |

The data indicates that a significant majority of respondents, at 68%, fall within the 25–34 age group, followed by 24% in the 18–24 age range. A smaller portion, only 8%, belongs to the 35–44 category.

This demographic distribution suggests that the study primarily captured the perspectives of young to early middle-aged adults, many of whom are likely to be active participants in or keen observers of current construction trends in Hargeisa. The prevalence of younger age groups may reflect a higher level of engagement and awareness regarding construction and sustainable development issues, as these individuals are often more attuned to contemporary challenges and innovations in the field. Their insights could provide valuable perspectives on the importance of sustainability, community involvement, and the potential impact of construction practices on their environment. This demographic focus not only highlights the voices of younger generations but also underscores the need for their active participation in shaping the future of construction practices that align with the values and aspirations of Hargeisa's evolving community.

4.2.1 Gender Distribution of Respondents

Table 4 Gender Distribution of Respondents

| Gender | Frequency | Percentage |
|---------------|------------------|-------------------|
| Female | 10 | 9% |
| Male | 101 | 91% |
| Total | 111 | 100% |

The data reveals a significant disparity in the gender distribution of respondents, with males comprising 91% of the sample (101 responses) and females accounting for only 9% (10 responses). This imbalance likely reflects the prevailing gender dynamics within the construction industry and related fields in Hargeisa, where male participation has traditionally been higher. The underrepresentation of female voices in the survey underscores a potential gap in understanding the diverse perspectives on construction practices and sustainable architecture, which are crucial for developing well-rounded and effective policies. This lack of female representation could lead to missed opportunities for incorporating valuable insights that might enhance community engagement and sustainability efforts. Further investigation is warranted to explore the underlying reasons behind this gender imbalance, such as cultural barriers, educational opportunities, or workplace dynamics. Addressing these issues is essential to ensure inclusivity in future research and interventions, ultimately fostering a more equitable environment where all voices can contribute to the dialogue on construction and development in Hargeisa.

4.2.2 Level of Education of Respondents

Table 5 Level of Education of Respondents

| Level education | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Bachelor's degree | 67 | 60% |
| High school diploma | 5 | 5% |
| Master's degree | 38 | 34% |
| No formal education | 1 | 1% |
| Total | 111 | 100% |

The data indicates that a significant majority of respondents hold a Bachelor's degree (60%), followed by those with a Master's degree (34%). A small percentage has a high school diploma (5%), and an even smaller fraction, just 1%, has no formal education. This distribution suggests that the survey predominantly captures the views of educated individuals, which may significantly influence the depth of understanding and awareness regarding construction practices and sustainable architecture. The high proportion of respondents with higher education levels likely correlates with a greater familiarity with the technical and environmental aspects of construction, enabling them to provide more nuanced and informed opinions on the subject matter. This educational background may also reflect an increased capacity to engage with complex issues related to sustainability, regulatory frameworks, and community impact. However, this focus on a more educated demographic could limit the diversity of perspectives, potentially overlooking the experiences and insights of less formally educated individuals who may also have valuable contributions to make regarding construction practices and community needs. Thus, it is essential to consider ways to include a broader range of voices in future research to ensure a more comprehensive understanding of the community's views on construction and development.

4.3. The impact of poor construction building on safety, durability, and functionality in Hargeisa, Somaliland.

4.3.1 Main Issues in Current Construction Practices

Table 6 Main Issues in Current Construction Practices

| Issue | Number of frequencies | Percentage (%) |
|-----------------------|-----------------------|----------------|
| Lack of skilled labor | 65 | 58.6% |
| Safety hazards | 57 | 51.4% |
| Poor materials | 51 | 45.9% |
| Environmental impact | 48 | 43.2% |
| Other | 10 | 9.0% |

Note: Respondents were allowed to select more than one option, so the total exceeds 100%

The results reveal that the predominant issue affecting construction quality in Hargeisa is the lack of skilled labor, with 58.6% of respondents highlighting it as a critical barrier. This shortage significantly undermines the overall quality of building projects. Additionally, safety hazards were cited by 51.4% of participants, indicating serious concerns about on-site practices that could jeopardize worker safety. Poor material quality is also a significant concern, with 45.9% of respondents identifying it as a major issue, underscoring the need for reliable construction materials. Environmental impact was acknowledged by 43.2% of respondents, reflecting a growing awareness of sustainability issues within the community. The low percentage of respondents (9%) who selected "Other" suggests that the primary challenges were largely encompassed within the predefined options, emphasizing the urgency of addressing these key issues to improve construction standards in Hargeisa.

4.3.2 Responses of environmental impact of construction activities

The data reveals that nearly half of respondents, at 49.5%, perceive the environmental impact of construction activities in Hargeisa as neutral, suggesting a limited awareness or a moderate stance on the issue. This indicates that many individuals may not fully understand the implications of construction practices on the environment or may feel ambivalent about them. Furthermore, a combined 35.1% of respondents view the impact as negative or very negative, highlighting significant concerns regarding harmful practices such as pollution, deforestation, and degradation of local ecosystems. These negative perceptions reflect a growing awareness of the environmental challenges associated with construction and point to a need for more responsible practices within the sector. In contrast, only 15.3% of respondents rated the impact as positive or very positive, which underscores a relatively low level of satisfaction with current environmental strategies employed in construction. This disparity in perceptions signals an urgent call for the industry to prioritize sustainability and engage with the community to improve environmental practices, enhance transparency, and foster a more environmentally conscious approach to construction that aligns with the values and concerns of the local population.

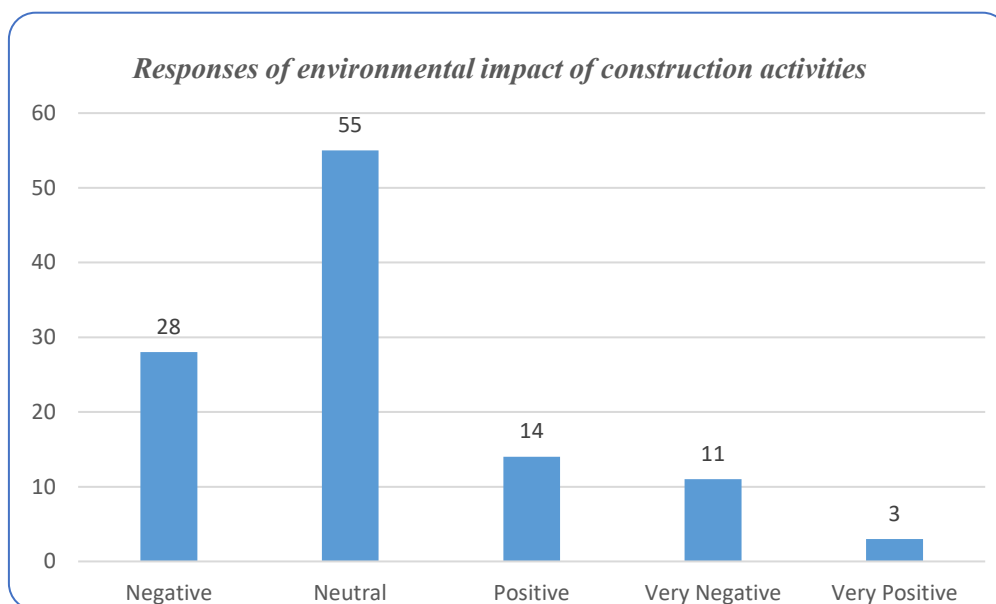


Figure 4 Perceptions of the Environmental Impact of Construction Activities in Hargeisa

4.3.3 Response of experienced issues with construction quality.

Table 7 Responses of believe most influence construction quality

| Response | Frequency | Percentage (%) |
|-----------------|------------------|-----------------------|
| Yes | 99 | 89.2% |
| No | 12 | 10.8% |
| Total | 111 | 100% |

The prevalence of construction quality issues, reported by an alarming 89.2% of respondents, signals a critical crisis within Hargeisa's construction sector. This overwhelming statistic not only underscores the extent of the problem but also reflects a widespread dissatisfaction that could jeopardize community safety and overall well-being. The urgency for reform is further emphasized by the nearly universal nature of these concerns, with only 10.8% of respondents indicating that they have not encountered any issues.

This situation necessitates a comprehensive approach to address the deficiencies in construction practices. Stakeholders, including government authorities, builders, and community members, must collaborate to establish and enforce stringent construction standards that prioritize safety and quality. Additionally, implementing public awareness campaigns could play a vital role in educating both builders and consumers about the importance of high-quality construction. Such initiatives can foster a culture of accountability and responsibility within the industry, ultimately leading to safer living and working environments. By engaging the community in these efforts, stakeholders can also ensure that the voices of those affected by construction practices are heard, paving the way for more inclusive and effective solutions to the pressing challenges facing Hargeisa's construction sector.

4.4. The economic and social implications of poorly construction buildings on residents and the city's development.

4.4.1 Construction Quality:

Table 8 Responses of believe most influence construction quality

| Factor | Frequency | Percentage (%) |
|-----------------------|-----------|----------------|
| Quality of materials | 88 | 79.3% |
| Skilled labor | 81 | 73.0% |
| Design practices | 68 | 61.3% |
| Financial resources | 58 | 52.3% |
| Regulatory compliance | 56 | 50.5% |
| Other | 4 | 3.6% |

The data clearly indicates that the quality of materials (79.3%) and the availability of skilled labor (73.0%) are viewed as the most critical factors influencing construction quality. This highlights a significant concern regarding both the technical inputs and the craftsmanship involved in construction projects. Additionally, design practices (61.3%) and financial resources (52.3%) are recognized as important contributors, suggesting that careful architectural planning and adequate funding are vital for achieving high-quality outcomes.

Interestingly, regulatory compliance (50.5%) is acknowledged as significant but is slightly less emphasized compared to the other factors. This may reflect a degree of skepticism regarding the enforcement of building codes or a lack of awareness among stakeholders about the existing regulations.

Furthermore, only 3.6% of respondents chose the "Other" option, indicating a limited identification of additional factors that might influence construction quality. This finding suggests that the primary concerns have been effectively captured, emphasizing the need to focus on the identified areas to enhance the overall construction environment in Hargeisa.

4.4.2 Responses of rate the overall quality of construction

The largest proportion of respondents, at 34.2%, rated the quality of construction in Hargeisa as average, indicating a generally moderate perception of the sector. However, a concerning 43.2% expressed dissatisfaction by rating it as "poor" or "very poor," highlighting significant concerns regarding construction standards. This dissatisfaction reflects a growing awareness of the challenges facing the industry and the potential risks associated with subpar construction practices. In contrast, only 22.5% of respondents rated the quality positively, classifying it as "good" or "very good," revealing a relatively low level of overall satisfaction among the community. This distribution underscores a pressing need for systemic improvements in various aspects of construction, including the quality of materials used, the effectiveness of supervision, and strict adherence to established standards. By addressing these deficiencies, stakeholders—including government authorities, builders, and community members—can work collaboratively to elevate construction quality in Hargeisa. Such efforts are crucial for enhancing safety, fostering public trust, and ultimately improving the living conditions within the city.

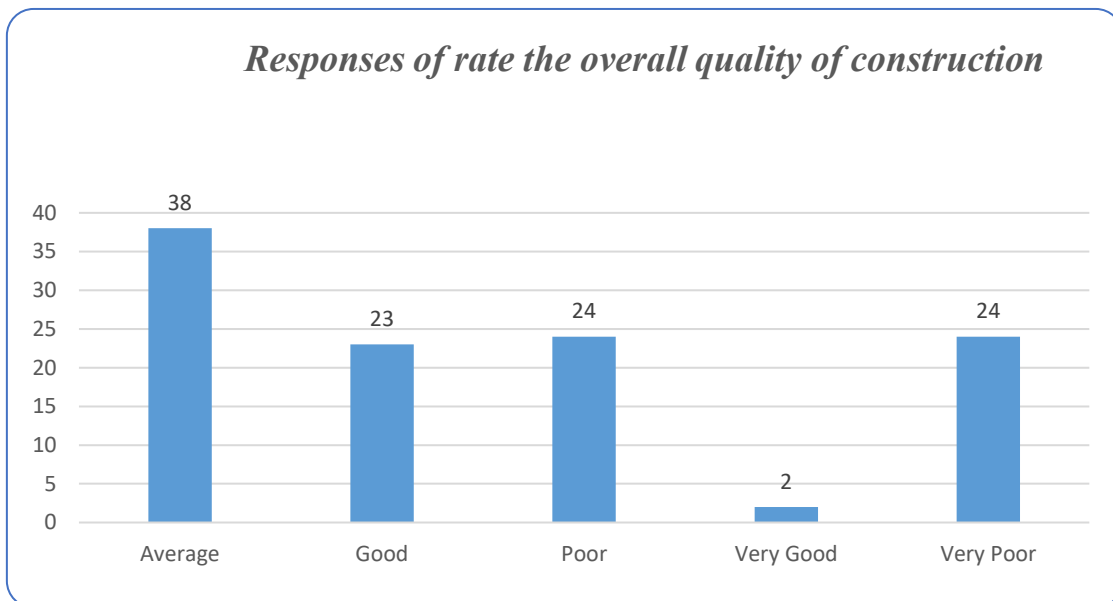


Figure 5 Responses of rate the overall quality of construction

4.5. The potential of sustainable architecture in addressing the challenges associated with poor construction design in Hargeisa.

4.5.1. important of sustainable architecture

Table 9 Responses of important do you think sustainable architecture

| Response | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Very important | 95 | 85.6% |
| Somewhat important | 15 | 13.5% |
| Not important | 1 | 0.9% |
| Total | 111 | 100% |

The data shows a strong consensus among respondents on the significance of sustainable architecture for Hargeisa. An overwhelming 85.6% believe it is very important, suggesting widespread public support for environmentally responsible, resource-efficient, and climate-conscious construction practices. This reflects a growing awareness of the long-term benefits of sustainable development, including improved energy efficiency, reduced environmental impact, and enhanced building performance.

Only a small minority—14.4% combined—viewed it as somewhat important or not important. This low level of opposition indicates that the concept of sustainability has gained traction within the community, possibly driven by the visible consequences of poor construction and increasing environmental concerns in the region.

Moreover, the high prioritization of sustainable architecture implies that stakeholders—including policymakers, developers, and urban planners—may find strong community backing when implementing green building initiatives, revising building codes, or allocating resources for sustainable projects. The data highlights an urgent need and a unique opportunity to integrate sustainable architecture into Hargeisa’s urban development strategy as a means of addressing both current construction challenges and future resilience.

4.5.2 Response of exist for implementing sustainable architecture.

The analysis indicates that the most significant barrier to implementing sustainable architecture in Hargeisa is a lack of awareness, cited by 63.1% of respondents. This underscores the need for educational campaigns, professional training, and public engagement to enhance understanding of sustainable design principles. Additionally, high costs (59.5%) and limited resources (58.6%) were frequently mentioned, reflecting financial and logistical challenges in low-income or rapidly urbanizing areas. Without economic incentives or cost-reducing strategies, sustainable architecture may remain out of reach for many developers and homeowners.

Government regulations (52.3%) were also identified as a barrier, suggesting that current policies may hinder rather than support sustainable design. This highlights the need for policy reform and the inclusion of sustainability criteria in construction codes. Though only 6.3% of respondents noted "Other" barriers, this indicates that additional context-specific challenges, such as a shortage of skilled professionals or cultural resistance, may also be affecting sustainable development.

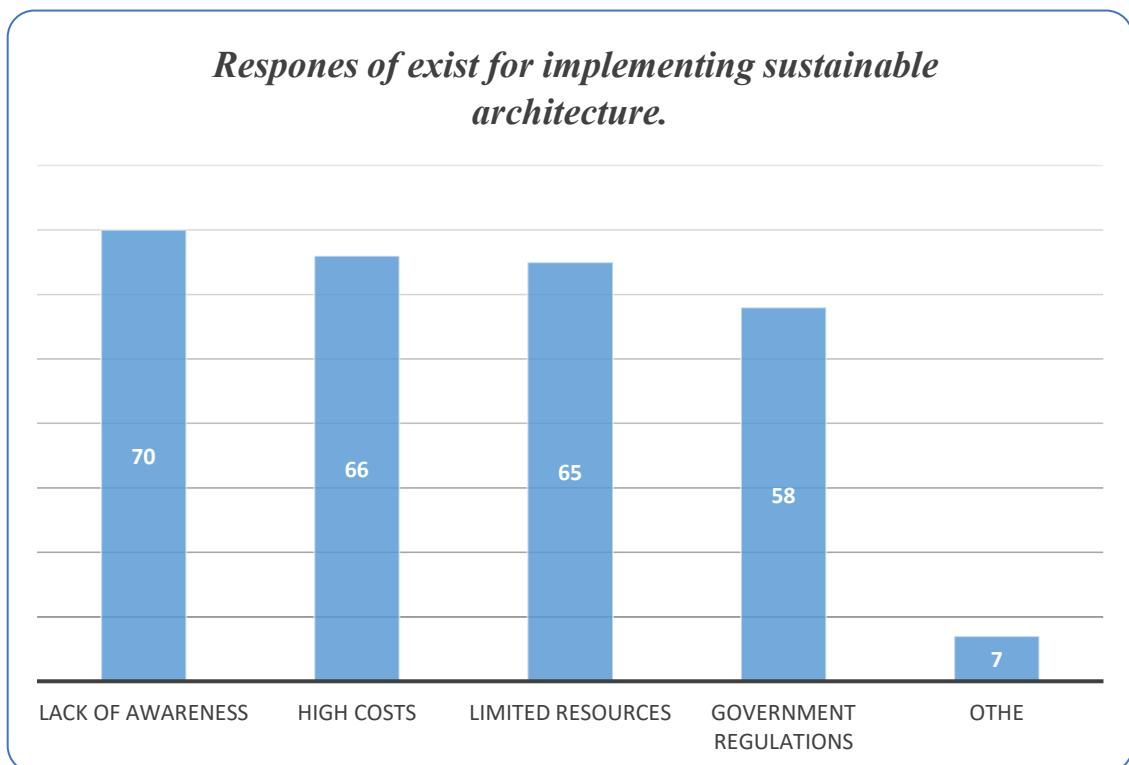


Figure 6 Response of exist for implementing sustainable architecture

4.5.3 Response of experienced issues with construction quality.

The prevalence of construction quality issues, as reported by 89.2% of respondents, signals a critical crisis in Hargeisa's construction sector. This overwhelming statistic not only emphasizes the extent of the problem but also indicates a widespread dissatisfaction that could impact the community's safety and well-being. The urgency for reform is further highlighted by the nearly universal nature of these concerns, with only 10.8% of respondents reporting no issues.

This situation necessitates a comprehensive approach to address the deficiencies in construction practices. Stakeholders, including government authorities, builders, and community members, must collaborate to establish and enforce stringent construction standards. Additionally, public awareness campaigns could play a vital role in educating both builders and consumers about the importance of quality construction, ultimately leading to safer living and working environments.

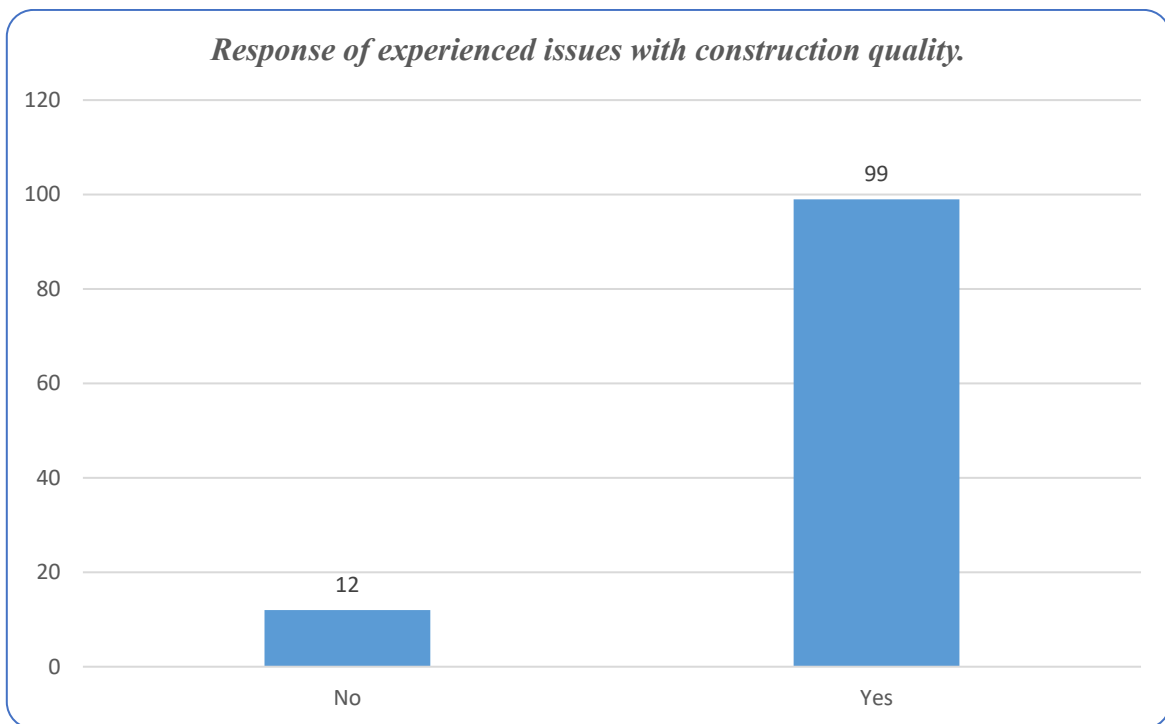


Figure 7 Response of experienced issues with construction quality.

4.5.4 Respondents' Awareness of Sustainable Practices.

Table 10 Response of exist for implementing sustainable architecture.

| Barrier | Frequency | Percentage (%) |
|------------------------|-----------|----------------|
| Lack of awareness | 70 | 63.1% |
| High costs | 66 | 59.5% |
| Limited resources | 65 | 58.6% |
| Government regulations | 58 | 52.3% |
| Other | 7 | 6.3% |

The analysis indicates that the most significant barrier to implementing sustainable architecture in Hargeisa is a lack of awareness, cited by 63.1% of respondents. This underscores the need for educational campaigns, professional training, and public engagement to enhance understanding of sustainable design principles. Additionally, high costs (59.5%) and limited resources (58.6%) were frequently mentioned, reflecting financial and logistical challenges in low-income or rapidly urbanizing areas. Without economic incentives or cost-reducing strategies, sustainable architecture may remain out of reach for many developers and homeowners.

Government regulations (52.3%) were also identified as a barrier, suggesting that current policies may hinder rather than support sustainable design. This highlights the need for policy reform and the inclusion of sustainability criteria in construction codes. Though only 6.3% of respondents noted "Other" barriers, this indicates that additional context-specific challenges, such as a shortage of skilled professionals or cultural resistance, may also be affecting sustainable development.

4.6. Government Policies and Stakeholder Engagement

4.6.1 The response of government should review and update construction policies.

The survey data indicates a clear preference for reviewing and updating construction policies with a strong emphasis on frequency. The most favored approach is annual reviews, chosen by 41.4% of respondents, reflecting a belief in the necessity of regular evaluations to keep policies effective and relevant. This preference underscores the importance of adaptability in the construction sector, where changes in regulations and practices can occur rapidly. Following this, 25.2% of participants indicated a preference for updates every 2-3 years, suggesting a balanced approach that allows for periodic reassessment without overwhelming changes. Additionally, 17.1% opted for “as needed” reviews, which implies a more flexible stance that allows for adjustments based on specific circumstances. In contrast, the option for updates every 5 years garnered the least support, with only 16.2% in favor, indicating a general consensus against infrequent reviews. This overall trend highlights a strong desire among respondents for regular and timely evaluations of construction policies to ensure they meet current needs and challenges effectively.

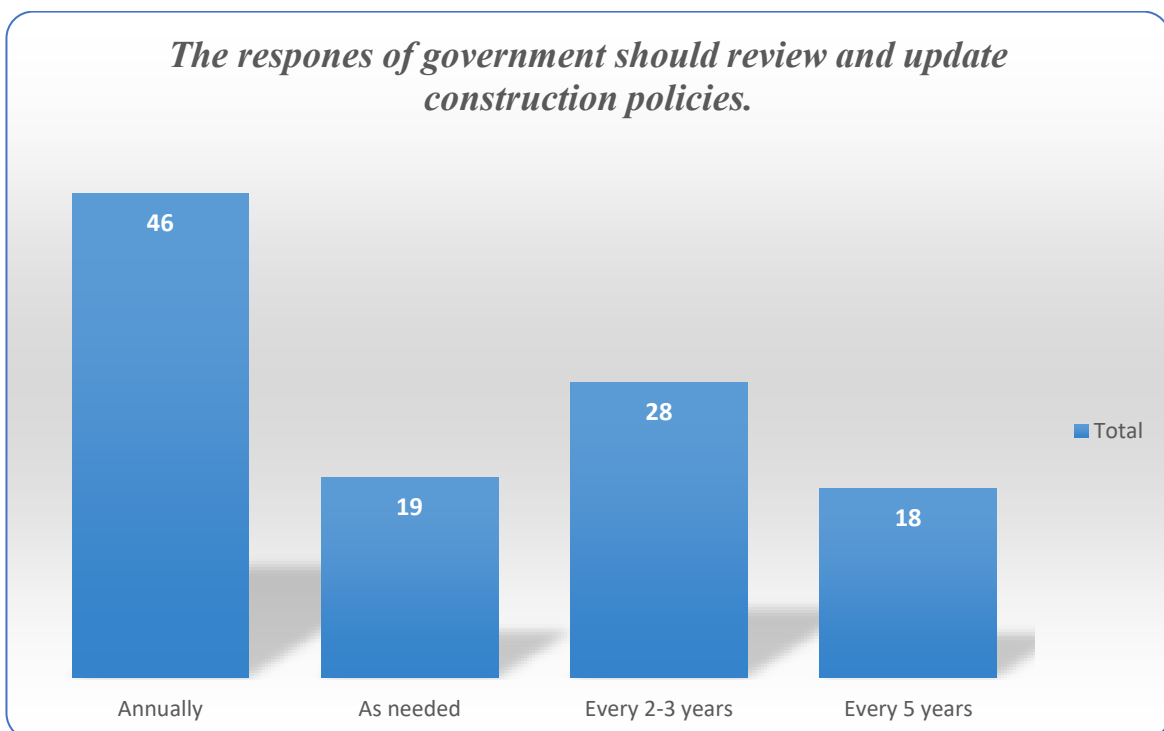


Figure 8 response of government should review and update construction policies.

4.6.2 The response of difficult in understanding construction regulations.

The data reveals that a significant 62.2% of respondents have encountered challenges in understanding or navigating construction regulations, pointing to a considerable barrier within the industry. This suggests that many individuals involved in construction processes find the regulations to be complex, ambiguous, or difficult to interpret, which can impede their ability to comply effectively and manage projects efficiently. Such difficulties may lead to costly delays, misunderstandings, and potential legal issues, highlighting the urgent need for clearer guidance and resources. In contrast, 37.8% of respondents indicated that they have not faced such difficulties, which could reflect a better understanding or familiarity with the regulations among this group. This divide in experiences emphasizes the importance of targeted educational initiatives and support mechanisms to enhance overall comprehension. By addressing the challenges faced by the majority, the industry can foster a more informed workforce, ultimately leading to improved compliance and smoother operations across construction projects.

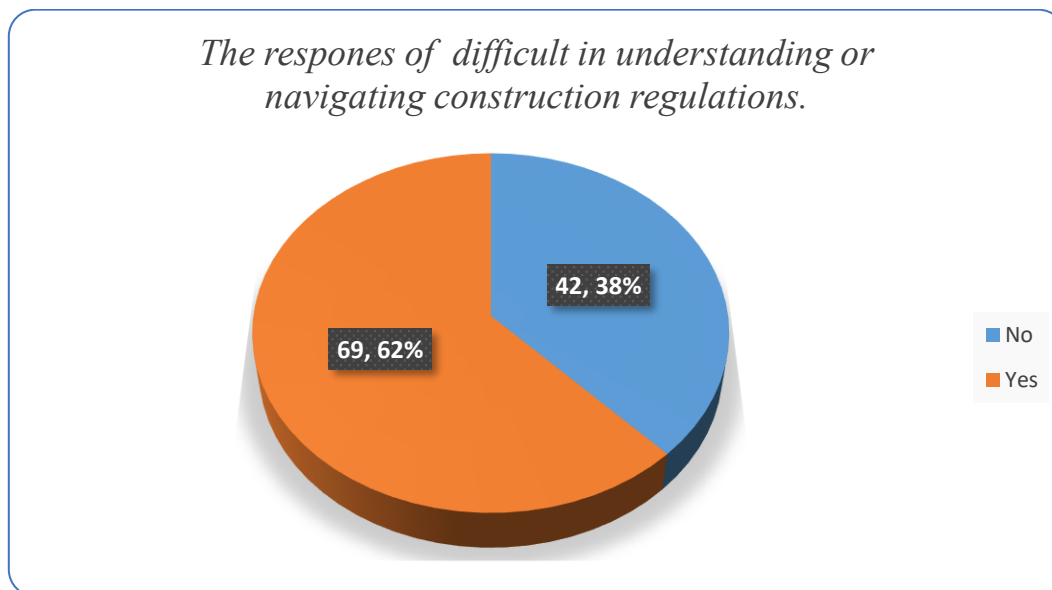


Figure 9 response of difficult in understanding construction regulations.

4.6.3 Response of community engagement plays in construction project.

Table 11 Response of community engagement plays in construction project.

| Response | Frequency | Percentage (%) |
|-----------------|------------------|-----------------------|
| Moderate role | 39 | 35.1% |
| Major role | 38 | 34.2% |
| Minor role | 26 | 23.4% |
| No role | 8 | 7.2% |
| Total | 111 | 100% |

The findings indicate that a significant majority of respondents, at 69.3%, believe that community engagement plays a moderate to major role in construction projects. This reflects a broad recognition of the importance of involving local communities throughout the planning, implementation, and oversight phases to ensure that construction efforts are not only structurally sound but also culturally appropriate, socially inclusive, and environmentally sustainable. Engaging the community serves as a vital feedback mechanism, enabling developers and authorities to identify potential challenges and local preferences early in the project lifecycle. This involvement fosters a sense of ownership among residents, which is crucial for the long-term success of construction initiatives.

In contrast, 23.4% of respondents view community engagement as having only a minor role, while 7.2% believe it has no role at all. This minority perspective highlights existing gaps in public participation, which may stem from factors such as limited access to information, weak community organization, or a lack of clear policies promoting inclusive practices. Such barriers can hinder effective collaboration between developers and communities, ultimately affecting the quality and acceptance of construction projects. Addressing these gaps is essential for enhancing community involvement and ensuring that construction efforts align more closely with the needs and values of the populations they impact.

4.6.4 Response community discussions or related to construction

Table 12 Response community discussions or related to construction

| Response | Frequency | Percentage (%) |
|----------|-----------|----------------|
| Yes | 80 | 72.1% |
| No | 31 | 27.9% |
| Total | 111 | 100% |

The data indicates that a substantial majority of respondents (72.1%) have been involved in community discussions or meetings related to construction. This high level of participation suggests a strong public interest in local development projects and a willingness among residents to engage in conversations that influence the built environment.

The findings also reinforce the earlier insight that many citizens view community engagement as an essential component of construction processes in Hargeisa. It shows that mechanisms for involvement already exist to some extent, and that residents are actively seeking ways to contribute to decisions that affect their surroundings.

However, the 27.9% who reported no involvement may reflect either a lack of opportunities, awareness, or access to these discussions. This highlights the need to broaden outreach efforts, particularly to underrepresented groups, and ensure that participation in construction planning is inclusive, equitable, and continuous—not just reactive.

In summary, while community involvement in construction matters is evidently present and valued, there is room for improvement in expanding participation and formalizing community roles in the decision-making process.

4.6.5 Response receives information about construction projects.

Table 13 Response receives information about construction projects.

| Information Channel | Frequency | Percentage of Total Respondents (n=111) |
|-------------------------------------|------------------|--|
| Social media | 80 | 72.1% |
| Community meetings | 63 | 56.8% |
| Direct communication from officials | 61 | 55.0% |
| Local news outlets | 47 | 42.3% |
| Other | 7 | 6.3% |

The data indicates that social media is the preferred communication channel for a substantial 72.1% of respondents seeking updates on construction activities, reflecting a broader global trend toward digital communication. This preference underscores the effectiveness of social media in disseminating information quickly and engaging a diverse audience. Additionally, community meetings, chosen by 56.8% of respondents, and direct communication from officials, favored by 55.0%, highlight the importance of in-person interactions in fostering trust and transparency within construction processes. While digital tools are increasingly valued, these findings demonstrate that traditional methods remain crucial for building relationships and ensuring community buy-in. Moreover, local news outlets serve as a moderately relied-upon source for 42.3% of respondents, particularly benefiting those with limited internet access. The low percentage of respondents—only 6.3%—who selected "Other" indicates that most preferences align with established communication channels. These insights emphasize the necessity for a multi-channel communication strategy in Hargeisa that effectively combines both traditional and digital methods. By leveraging the strengths of social media alongside formal community-based communication, stakeholders can achieve broader reach and enhance public engagement across various demographics, ultimately leading to more informed and participatory construction processes.

4.7. Summery of finding

The study reveals that Hargeisa faces significant construction challenges, including poor building quality, inadequate skilled labor, and weak regulatory enforcement. These issues not only compromise the integrity of structures but also pose risks to public safety. Environmental concerns, such as pollution and deforestation, were widely recognized among respondents, reflecting a growing awareness of the ecological impact of construction activities. Despite these pressing challenges, there is strong public support for sustainable architecture, particularly in areas like energy efficiency and the use of locally sourced materials, indicating a desire for more environmentally friendly practices.

However, barriers such as high costs and limited awareness significantly hinder progress toward sustainable construction goals. Many community members may lack the knowledge needed to advocate for or implement these practices effectively. While community engagement is acknowledged as crucial for advancing construction practices, actual participation remains low, suggesting a disconnect between the recognition of the need for involvement and the willingness to engage actively in initiatives.

Overall, the findings highlight both the urgent need for improvement in construction standards and practices, as well as the public's readiness to support more sustainable and inclusive approaches. This presents an opportunity for stakeholders to address existing barriers, enhance education and awareness, and foster greater community involvement, ultimately leading to safer, more sustainable construction practices that benefit both the community and the environment.

CHAPTER FIVE

RECOMMENDATION, AND CONSOLATION.

5.1 Introduction

This chapter presents a summary of the key findings derived from the data analysis and outlines practical recommendations based on those insights. It aims to bridge the gap between the observed challenges in the construction sector of Hargeisa and actionable solutions that promote sustainable urban development. Drawing from responses gathered through structured questionnaires, the findings highlight critical issues related to construction quality, environmental impact, stakeholder engagement, and awareness of sustainable architectural practices.

The chapter also proposes strategic recommendations for improving construction standards, promoting policy reforms, and enhancing community participation. Finally, the chapter concludes with a reflection on the overall research objectives, emphasizing the implications of the study for future development planning in Hargeisa and similar urban environments. By integrating community perceptions and professional insights, this chapter serves as a foundation for informed decision-making among policymakers, practitioners, and development stakeholders.

5.2 Conclusion

This research has successfully culminated in achieving its designated aims by systematically fulfilling its three specific objectives, thereby providing a comprehensive analysis of Hargeisa's construction sector. In pursuit of its first and second objectives.

the study began by assessing the impacts of poor construction on safety, durability, and functionality, and concurrently analyzing the profound socio-economic implications for residents and urban development. The findings revealed a critical state of affairs, characterized by widespread structural deficiencies and safety hazards that threaten residents' well-being and impose significant economic burdens, as confirmed by the overwhelming majority of respondents who have personally experienced issues related to substandard building quality.

third objective by exploring the potential of sustainable architecture as a viable solution to these identified challenges. This exploration confirmed a strong public appetite for sustainable practices, with significant support for attributes like energy-efficient designs and the use of local materials, which are seen as pathways to long-term cost savings and improved quality of life. The investigation also pragmatically identified the primary barriers hindering this transition, including high initial costs, limited awareness, and inadequate government regulations. Ultimately, this holistic analysis informed a set of strategic recommendations aimed at fostering a paradigm shift. These strategies advocate for a multi-pronged approach: strengthening regulatory enforcement, investing in professional training to close the skills gap, and launching robust public awareness campaigns supported by tangible government incentives. By meeting these objectives, this study not only diagnoses the core problems but also provides an actionable framework for reshaping Hargeisa's development towards a more resilient, safe, and environmentally sustainable urban future.

5.3. RECOMMENDATION

Based on the comprehensive analysis of the challenges facing Hargeisa's construction sector and the opportunities presented by sustainable architecture, this study proposes a multi-faceted strategy of feasible, context-specific recommendations to guide future policy and practice. A foundational first step is to strengthen and simplify the existing regulatory frameworks, which involves clarifying the building codes to address the difficulties in understanding them reported by a majority of stakeholders and establishing a stringent enforcement mechanism. This regulatory enhancement must be complemented by a dual initiative to enhance professional capacity and public awareness in order to combat the critical lack of skilled labor and the low awareness identified as a primary barrier to sustainability. This would involve launching government-supported vocational training programs and rolling out continuous public awareness campaigns that utilize effective local channels like social media and community meetings. To address the significant financial barriers of high costs and limited resources, it is crucial to develop feasible financial incentives, such as tax rebates for developers or low-interest "green loans" for homeowners, reflecting the public's desire for increased government funding for sustainable initiatives. Furthermore, to directly address the primary public concern over the poor quality of construction inputs, it is recommended that a formal material quality control and certification system be established to test and verify both imported and local materials. Finally, to ensure these interventions are socially integrated and responsive to community needs, stakeholder engagement processes must be formalized through mandatory consultation meetings for major projects, creating a reliable platform for public feedback. Collectively, these integrated recommendations provide an actionable roadmap for systematically dismantling the barriers to quality construction and fostering a culture of sustainability in Hargeisa's built environment.

REFERENCE

- Abdillahi, A. M., Parlak Biçer, Z. Ö., & Bayram, S. (2024). Assessment of Construction Site Management Practices: A Case Study of a Construction Project in Hargeisa. *Journal of Advanced Research in Natural and Applied Sciences*, 10(1), 228–242. <https://doi.org/10.28979/jarnas.1285355>
- Datta, S. D., Tayeh, B. A., Hakeem, I. Y., & Abu Aisheh, Y. I. (2023). Benefits and Barriers of Implementing Building Information Modeling Techniques for Sustainable Practices in the Construction Industry—A Comprehensive Review. *Sustainability*, 15(16), 12466. <https://doi.org/10.3390/su151612466>
- Dhruv Sai Reddy, L. (2023). Study on Sustainable Architecture. *International Journal of Science and Research (IJSR)*, 12(1), 469–471. <https://doi.org/10.21275/SR23110215520>
- Goh, C. S., Chong, H.-Y., Jack, L., & Mohd Faris, A. F. (2020). Revisiting triple bottom line within the context of sustainable construction: A systematic review. *Journal of Cleaner Production*, 252, 119884. <https://doi.org/10.1016/j.jclepro.2019.119884>
- Grierson, D. (2011). “Towards a Typology of Sustainable Building Design” at University of Rome, Italy, February 2011.
- Yashchenko, O., Makatora, D., & Kubanov, R. (2024a). SUSTAINABLE DEVELOPMENT AND ARCHITECTURE: ECONOMIC FEASIBILITY OF DUALISTIC CONSTRUCTION. *Herald of Khmelnytskyi National University. Economic Sciences*, 326(1), 112–117. <https://doi.org/10.31891/2307-5740-2024-326-19>
- Yashchenko, O., Makatora, D., & Kubanov, R. (2024b). SUSTAINABLE DEVELOPMENT AND ARCHITECTURE: ECONOMIC FEASIBILITY OF DUALISTIC CONSTRUCTION. *Herald of Khmelnytskyi National University. Economic Sciences*, 326(1), 112–117. <https://doi.org/10.31891/2307-5740-2024-326-19>
- Dhruv Sai Reddy, L. (2023). Study on Sustainable Architecture. *International Journal of Science and Research (IJSR)*, 12(1), 469–471. <https://doi.org/10.21275/SR23110215520>
- Goh, C. S., Chong, H.-Y., Jack, L., & Mohd Faris, A. F. (2020). Revisiting triple bottom line within the context of sustainable construction: A systematic review.

Journal of Cleaner Production, 252, 119884.
<https://doi.org/10.1016/j.jclepro.2019.119884>

- Grierson, D. (2011). “Towards a Typology of Sustainable Building Design” at University of Rome, Italy, February 2011.
- Yashchenko, O., Makatora, D., & Kubanov, R. (2024). SUSTAINABLE DEVELOPMENT AND ARCHITECTURE: ECONOMIC FEASIBILITY OF DUALISTIC CONSTRUCTION. Herald of Khmelnytskyi National University. Economic Sciences, 326(1), 112–117. <https://doi.org/10.31891/2307-5740-2024-326-19>
- Abdillahi, A. M., Parlak Biçer, Z. Ö., & Bayram, S. (2024a). Assessment of Construction Site Management Practices: A Case Study of a Construction Project in Hargeisa. Journal of Advanced Research in Natural and Applied Sciences, 10(1), 228–242. <https://doi.org/10.28979/jarnas.1285355>
- Abdillahi, A. M., Parlak Biçer, Z. Ö., & Bayram, S. (2024b). Assessment of Construction Site Management Practices: A Case Study of a Construction Project in Hargeisa. Journal of Advanced Research in Natural and Applied Sciences, 10(1), 228–242. <https://doi.org/10.28979/jarnas.1285355>
- Abdillahi, A. M., Parlak Biçer, Z. Ö., & Bayram, S. (2024c). Assessment of Construction Site Management Practices: A Case Study of a Construction Project in Hargeisa. Journal of Advanced Research in Natural and Applied Sciences, 10(1), 228–242. <https://doi.org/10.28979/jarnas.1285355>
- Abu Bakar, N. F. S., Ismail, S., Che Amat, R., & Durdyev, S. (2018). Sustainable Construction in Malaysian Mixed Development Projects: The Barriers and Critical Success Factors. The Journal of Social Sciences Research, SPI6, 885–892. <https://doi.org/10.32861/jssr.spi6.885.892>
- Akadiri, P. O., Chinyio, E. A., & Olomolaiye, P. O. (2012). Design of A Sustainable Building: A Conceptual Framework for Implementing Sustainability in the Building Sector. Buildings, 2(2), 126–152. <https://doi.org/10.3390/buildings2020126>
- Anwar, R. R., Pratikso, P., Wibowo, K., & Wardiningsih, S. (2024). Analisis Resiko Lingkungan dalam Pembangunan Gedung di Atas Tanah Lunak. AKADEMIK: Jurnal Mahasiswa Humanis, 4(2), 394–402. <https://doi.org/10.37481/jmh.v4i2.811>

- Barrantes, J. M., Piedra-Marin, G., Brenes, J. S., & Cordero, M. (2018). ENVIRONMENTAL IMPACT FOLLOW UP: A CASE STUDY OF SEVERAL CONSTRUCTION PROJECTS IN VARIOUS UNIVERSITY CAMPUSES. 21–33. <https://doi.org/10.2495/WM180031>
- Bulbaai, R. R., & Halman, J. I. M. (2024). Energy Awareness, Energy Use, and Energy-Saving Opportunities in the Caribbean: The Island Curaçao as a Case Study. *Energies*, 17(19), 4829. <https://doi.org/10.3390/en17194829>
- Chen, D. (2025). Land and Property Taxation to Finance Urban Development in Somaliland: Challenges and Prospects for Reform. Institute of Development Studies. <https://doi.org/10.19088/ICTD.2024.116>
- Ellingwood, B. R. (2001). Acceptable risk bases for design of structures. *Progress in Structural Engineering and Materials*, 3(2), 170–179. <https://doi.org/10.1002/pse.78>
- El-Sayed, A. A., & El-Anwar, O. H. (2015). Quantifying socioeconomic disruptions caused by construction in densely populated areas. <https://doi.org/10.14288/1.0076380>
- Ename Minko, A. (2025). Climate Change and Internal Environmental Displacement in Somalia: Analyzing the Linkages Between Environmental Degradation, Conflict Dynamics, and Displacement Trends. *Journal of Internal Displacement*, 15(1), 10–29. <https://dx.doi.org/10.4314/jid.v15i1.1>
- Galbur, I. (2025). Barriers and difficulties in managing sustainable strategies in construction companies. *Journal of Research on Trade, Management and Economic Development*, 11(2(22)), 95–105. <https://doi.org/10.59642/JRTMED.2.2024.06>
- Influence of Socio-Economic Factors on Performance of Road Construction Projects: A Case of Berbera Corridor Road Section between Hargeisa and Berbera. (2024). *British Journal of Arts and Humanities*, 156–165. <https://doi.org/10.34104/bjah.02401560165>
- Iqbal, S., Nawaz, M. J., Hamza, A., Khan, H. A., Butt, M. M., & Maqsood, A. (2024). Analyzing The Causes of Project Failure and Cost Overruns in Building Construction Industry by Using a Mixed-Methods Approach. *Pakistan Journal of Humanities and Social Sciences*, 12(2), 1898–1916. <https://doi.org/10.52131/pjhss.2024.v12i2.2311>

- Jarrah, R. T., & Siddiqui, M. K. (2012). Sustainability: Opportunities and Challenges from a Construction Contractor's Perspective. *ICSDEC 2012*, 601–608. <https://doi.org/10.1061/9780784412688.072>
- Joint Stock Company «Institute of Regional Economic Research», Moscow, Russian Federation, & Zvorykina, T. I. (2024). Quality of the urban environment as a driver for sustainable economic development of the territory. *Bulletin of Russian Academy of Natural Sciences*, 24(4), 96–104. <https://doi.org/10.52531/1682-1696-2024-24-4-96-104>
- Kazan State University of Architecture and Engineering, Ivanova, T. O., Zabruskova, M. Yu., & Kazan State University of Architecture and Engineering. (2023). Application of sustainable architecture principles in buildings of innovative research and production facilities. *Architecton: Proceedings of Higher Education*, 4. [https://doi.org/10.47055/19904126_2023_3\(83\)_4](https://doi.org/10.47055/19904126_2023_3(83)_4)
- Latif, M. (2023). Analyzing the Key Factors Contributing to Project Delays in the Construction Industry: A Comprehensive Study. *Journal of Development and Social Sciences*, 4(III). [https://doi.org/10.47205/jdss.2023\(4-III\)85](https://doi.org/10.47205/jdss.2023(4-III)85)
- Liu, X., Wu, X., Li, X., Xu, X., Liao, W., Jiao, L., Zeng, Z., Chen, G., & Li, X. (2025). Global Mapping of Three-Dimensional Urban Structures Reveals Escalating Utilization in the Vertical Dimension and Pronounced Building Space Inequality. *Engineering*, 47, 86–99. <https://doi.org/10.1016/j.eng.2024.01.025>
- McKenzie, T. (2020). Environmental Innovations in Urban Ecosystems. In C. D. Caldwell & S. Wang (Eds.), *Introduction to Agroecology* (pp. 237–258). Springer Singapore. https://doi.org/10.1007/978-981-15-8836-5_18
- Miakhel, M., Abdulrahimzai, A. A., Habib, A., & Behsoodi, M. M. (2024). Urban Green Infrastructures and Its Impacts on the Urban Environment: A Review. *Journal of Environment, Climate, and Ecology*, 1(2), 9–15. <https://doi.org/10.69739/jece.v1i2.135>
- Namian, M., Al-Bayati, A., Karji, A., & Tafazzoli, M. (2021). Investigating Barriers to Implement and Develop Sustainable Construction. In I. El Dimeery, M. Baraka, S. M. Ahmed, A. Akhnoukh, M. B. Anwar, M. El Khafif, N. Hanna, & A. T. Abdel Hamid (Eds.), *Design and Construction of Smart Cities* (pp. 247–252). Springer International Publishing. https://doi.org/10.1007/978-3-030-64217-4_28

- Nyirakamana, C., Van Den Boogaard, V., & Ahmed, W. (2024). Land and Property Taxation to Finance Urban Development in Somaliland: Challenges and Prospects for Reform. Institute of Development Studies. <https://doi.org/10.19088/ICTD.2024.083>
- Obinna Iwuanyanwu, Ifechukwu Gil-Ozoudeh, Azubuike Chukwudi Okwandu, & Chidiebere Somadina Ike. (2024). The role of green building materials in sustainable architecture: Innovations, challenges, and future trends. *International Journal of Applied Research in Social Sciences*, 6(8), 1935–1950. <https://doi.org/10.51594/ijarss.v6i8.1476>
- On, K., & Techapeeraparnich, W. (2021). Barriers to Implementation of Sustainable Construction in Cambodia Construction Industry. 2021 The 7th International Conference on Frontiers of Educational Technologies, 213–219. <https://doi.org/10.1145/3473141.3473251>
- Otón, M. P., Lois González, R. C., P.A.M. Van Campenhout, I., Schokker, J., Watson, C., & Van Der Meulen, M. J. (2021). Emerging User Needs in Urban Planning. In A. Keith Turner, H. Kessler, & M. J Van Der Meulen (Eds.), *Applied Multidimensional Geological Modeling* (1st ed., pp. 383–401). Wiley. <https://doi.org/10.1002/9781119163091.ch16>
- Rahmanivahid, P., Khashehchi, M., Thangavel, S., & Heidari, M. (2024). Social, economic, and environmental issues associated with sustainable buildings. In C. S. Meena, A. Kumar, V. P. Singh, & A. Ghosh, *Sustainable Technologies for Energy Efficient Buildings* (1st ed., pp. 297–312). CRC Press. <https://doi.org/10.1201/9781003496656-14>
- Tembo, M., Mwanaumo, E. M., & Kahanji, C. (2023). Impact of Globalization on Sustainable Implementation in the Construction Industry: Dynamics of Construction Tender-Price Volatility. *International Journal of Developing and Emerging Economies*, 11(1), 19–53. <https://doi.org/10.37745/ijdee.13/vol11n11953>
- Thomas, R. V., Nair, D. G., & Enserink, B. (2023). Conceptual framework for sustainable construction. *Architecture, Structures and Construction*, 3(1), 129–141. <https://doi.org/10.1007/s44150-023-00087-8>
- Tjebane, M. M., Musonda, I., Onososen, A., & Ramabodu, M. (2023). Challenges for the Implementation of Sustainable Construction Practices in Developing Countries: A Bibliometric Review. In S. Skatulla & H. Beushausen (Eds.), *Advances*

- in Information Technology in Civil and Building Engineering (Vol. 358, pp. 109–123). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-32515-1_9
- Toriola-Coker, L. O., Alaka, H., Bello, W. A., Ajayi, S., Adeniyi, A., & Olopade, S. O. (2021). Sustainability Barriers in Nigeria Construction Practice. IOP Conference Series: Materials Science and Engineering, 1036(1), 012023. <https://doi.org/10.1088/1757-899X/1036/1/012023>
 - Zavadskas, E. K., Antucheviciene, J., Hosseini, M. R., & Martek, I. (2021). Sustainable Construction Engineering and Management. Sustainability, 13(23), 13028. <https://doi.org/10.3390/su132313028>

APPENDIX I - QUESTIONNAIRE

The Impact of Poor Construction building, and the role of Sustainable Architecture in Hargeisa, Somaliland

Questionnaire:

Section 1: Demographic Information

1: Age:

- Under 18
- 18-24
- 25-34
- 35-44
- 45 and above

2. Occupation:

- Student
- Architect/Engineer
- Builder/Contractor
- Government Official
- Other: _____

3. Level of Education:

- No formal education
- High school diploma
- Bachelor's degree
- Master's degree
- Other: _____

Section 2: Awareness of Construction Practices

4. How familiar are you with the construction practices in Hargeisa?

- Very familiar
- Somewhat familiar
- Not familiar

5. What do you perceive as the main issues with current construction practices?

(Select all that apply)

- Safety hazards
- Poor materials
- Lack of skilled labor
- Environmental impact
- Other:

Section 3: Environmental Impact of construction activities

6. How do you perceive the environmental impact of construction activities in Hargeisa?

- Very Negative
- Negative
- Neutral
- Positive
- Very Positive

7. What specific environmental issues do you associate with construction in Hargeisa? (Select all that apply)

- Air pollution
- Water pollution
- Deforestation

- Waste generation
- Habitat destruction

Other Section 4: Construction Quality:

8. How would you rate the overall quality of construction in Hargeisa?

- Very Poor
- Poor
- Average
- Good
- Very Good

9. What factors do you believe most influence construction quality? (Select all that apply)

- Skilled labor
- Quality of materials
- Regulatory compliance
- Design practices
- Financial resources
- Other

10. Have you personally experienced issues with construction quality in your residence or business?

- Yes
- No

11. How satisfied are you with the construction quality of recent projects in your area?

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

12. Have you or someone you know experienced issues related to poor construction?

- Yes

- No

Section 5: Sustainable Architecture:

13. How important do you think sustainable architecture is for Hargeisa?

- Very important
- Somewhat important
- Not important

14. What sustainable practices are you aware of? (Select all that apply)

- Use of local materials
- Energy-efficient designs
- Water conservation techniques
- Community involvement in planning
- Other:

15. What barriers do you think exist for implementing sustainable architecture in Hargeisa? (Select all that apply)

- Lack of awareness
- High costs
- Limited resources
- Government regulations
- Other:

Section 6: Stakeholder Engagement:

16. How often do you engage with construction stakeholders (e.g., contractors, government officials)?

- Never
- Rarely
- Sometimes
- Often
- Always

17. What role do you think community engagement plays in construction projects?

- No role
- Minor role
- Moderate role
- Major role

18. Have you been involved in any community discussions or meetings related to construction?

- Yes
- No

19. How do you prefer to receive information about construction projects in your area? (Select all that apply)

- Community meetings
- Social media
- Local news outlets
- Direct communication from officials
- Other:

Section 7: Policy Effectiveness:

20. How effective do you think government policies are in promoting sustainable construction?

- Very Ineffective
- Ineffective
- Neutral
- Effective
- Very Effective

21. What improvements would you suggest for government policies related to construction?

- Stricter regulations
- Increased funding for sustainable initiatives
- Better training programs
- Enhanced public awareness campaigns
- Other:

22. How often do you think the government should review and update construction policies?

- Annually
- Every 2-3 years
- Every 5 years
- As needed

23. Have you faced any difficulties in understanding or navigating construction regulations?

- Yes
- No