

**THE CHALLENGES AND CONSEQUENCES OF INFORMAL
SETTLEMENT ON THE ENVIRONMENT AND LIVELIHOOD OF
THE COMMUNITY: THE CASE OF ADAMA TOWN, BOKU
SHANAN SUB-CITY.**



Kidist Mesfin Gezahgne

A Thesis Submitted to the department of Architecture, School of Civil Engineering and
Architecture

Presented in Partial Fulfillment of the Requirement for the Degree of Masters of Science
in Urban Planning and Design

Office of Graduate Studies
Adama Science and Technology University

June, 2024
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DECLARATION

I hereby declare that this Master Thesis entitled “The challenges and Consequences of informal settlement on the environment and livelihood of the community in Adama town, Boku Shenen sub-city” 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.

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Recommendation of Advisors/ Supervisors

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TABLE OF CONTENTS

ACKNOWLEDGEMENT	iv
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ACRONYM.....	x
ABSTRACT.....	xi
CHAPTER ONE	1
1. INTRODUCTION	1
1.1. Background of Study.....	1
1.2. Statement of the Problem	4
1.3. Objective of the study	5
1.3.1. General objective of the study	5
1.3.2. Specific objectives of the study	6
1.4. Research Questions	6
1.5. Scope of the study	6
1.6. Significances of the study	6
1.7. Operational Definitions	7
1.8. Limitation of the Study	8
1.9. Organization of the Thesis	8
CHAPTER TWO	10
2. REVIEW OF RELATED LITERATURE.....	10
2.1. Introduction	10
2.2. Conceptual Definition of Informal Settlements	10
2.2.1. Definition of Informal Settlements.....	11
2.2.2. Characteristics of Informal Settlements.....	12
2.2.3. History of Informal Settlements.....	14
2.2.4. Theories and Approaches in Informal Settlements	15
2.2.5. Consequences of Informal Settlements	17
2.3. Empirical Literature Review	17
2.4. Factors contributing to the growth of informal settlements	18
2.5. Socio-economic and environmental consequences of informal settlements	20

2.6.	Impact of informal settlements on the existing urban infrastructure and services.....	21
2.7.	Sustainable strategies that implemented to transform informal settlements.....	23
2.8.	Gaps of the Study	24
CHAPTER THREE		26
3.	Methods and Materials	26
3.1.	Introduction	26
3.2.	Description Study Area	26
3.3.	Research Approach	27
3.4.	Research design.....	28
3.5.	Data type and source	29
3.6.	Population and Sampling Frame	30
3.7.	Sampling Technique.....	31
3.8.	Sample size determination	31
3.9.	Data Collection Method	32
3.9.1.	Interview	32
3.9.2.	Focus group discussions	33
3.9.3.	Questionnaires/Surveys.....	33
3.9.4.	Field Observations	34
3.9.5.	Document Analysis.....	34
3.9.6.	Remote Sensing and GIS	34
3.9.7.	Amenities and Services.....	34
3.10.	Data analysis Method	35
3.11.	Validity and Reliability	37
3.11.1.	The study method's validity	37
3.11.2.	Reliability of Questionnaire.....	38
3.12.	Ethical consideration	40
CHAPTER FOUR.....		41
4.	RESULTS AND DISCUSSIONS.....	41
4.1.	Introduction	41
4.2.	Respondent's Profile	42
4.2.3.	Respondents Educational Background.....	43

4.2.4.	Respondents Marital status	44
4.2.5.	Respondents Occupation.....	44
4.2.6.	Respondents Monthly income.....	45
4.3.	The Factors Contributing to the Growth of Informal Settlements	46
4.4.	The Consequences of Informal Settlements on the City, Its Residents, existing urban infrastructure and services.....	50
4.5.	Focus Group Discussion.....	55
4.6.	The Sustainable Strategies Implemented to Transform Informal Settlements.....	59
CHAPTER FIVE		62
5.	CONCLUSIONS AND RECOMMENDATIONS.....	62
5.1.	Conclusion.....	62
5.2.	Recommendation.....	63
REFERENCE.....		65
APPENDIX.....		71
Appendix A: Survey Questionnaire		71
Appendix B: Focus Group Discussion Question.....		76
Appendix C: Interview Question.....		77
Appendix D: Gaaffii Qorannoo.....		78

LIST OF TABLES

Table 2. 1: Factors contributing to the growth of informal settlements.....	19
Table 3. 1: Distribution of sample size	32
Table 3. 2: Result of Reliability test	39
Table 4. 1: Gender of the Respondents	42
Table 4. 2: Age of the respondents	43
Table 4. 3: Respondents Educational Background	43
Table 4. 4: Respondents Marital status	44
Table 4. 5: Respondents Occupation	44
Table 4. 6: Respondents Monthly income	46
Table 4. 7: Factors contributing to the growth of informal settlements.....	47
Table 4. 8: Consequences of informal settlements	50
Table 4. 9: Sustainable strategies implemented to transform informal settlements	59

LIST OF FIGURES

Figure 3. 1: Map of Adama, Boku Shenen sub city	27
Figure 3. 2: Map of Adama, Boku Shenen sub city Land use and Classification	35
Figure 4. 1: Map of Adama, Boku Shenen sub city informal settlement.....	42
Figure 4. 2: The informal business (calling it unemployed).....	45
Figure 4. 3: Low-Income Group of Peoples Un-able to Re-build their Houses	46
Figure 4. 4: Impacts of informal settlements on the urban infrastructure and services	55
Figure 4. 5: Demolished Houses	58

LIST OF ACRONYM

CAD	Computer aided and Drafting
GIS	Geographic Information System
NGOs	Non-governmental organizations
RII	Relative importance index
SPSS	Statistical Package for service solutions
UN	United Nation

ABSTRACT

Cities all across the world, including Adama city, are witnessing an increase in the phenomena of informal settlements. The study aims to investigate and analyze the challenges and consequences of informal settlements on the environment and livelihood of the community in Adama Town, Boku Shanan Sub-City. To achieve the objective, the study used a mixed-research approaches that combines quantitative and qualitative research methods. Data are acquired by using a questionnaire, interview, remote sensing technique, field observations, amenities and services, document analysis and focus group discussions. The research design was used a combination of descriptive and exploratory research design; asimple random sampling technique was used. The data analysis methods were used descriptive analysis techniques and exploratory analysis techniques using mean scores and standard deviation and relative important index method. The study findings addresses contributing to the growth of informal settlements underlying factors is crucial for developing effective and sustainable strategies to manage and integrate informal settlements into the urban fabric of Adama. This requires a multifaceted approach involving land tenure reforms, affordable housing initiatives, improved urban planning, inclusive governance, and fair compensation practices for peri-urban farmers. The socio-economic and environmental consequences of informal settlements in Adama's Boku Shenen sub-city have far-reaching impacts on the city, its residents, existing urban infrastructure, and services. Addressing these issues requires comprehensive strategies that prioritize access to basic services, improved infrastructure, and sustainable urban planning to enhance the overall quality of life for all residents. By addressing the key challenges, policymakers can work towards enhancing the resilience and sustainability of urban infrastructure and services in Adama's informal settlements. By addressing the underlying challenges faced by residents in these settlements and promoting inclusive urban development practices, local authorities can work towards building a more sustainable and equitable city for all.

Key Words: - Challenges, Consequences, Informal Settlement, Livelihood and Urbanization

CHAPTER ONE

1. INTRODUCTION

This chapter covers background information, statement of the research problem, research questions and research objectives. It further presents the significance of the study, scope of the study, the expected outcomes of the study, operational definition and structure of research.

1.1. Background of Study

Urbanization, the process of increasing population concentration in urban areas, is a defining global trend. The world's urban population has skyrocketed in recent decades, exceeding 50% of the total population and expected to reach two-thirds by 2050. This rapid growth is particularly pronounced in developing regions like Africa, where the urban population is projected to double by 2050. This rapid urbanization brings about significant opportunities for economic development and social progress but also presents numerous challenges (Mezgebo, 2021).

Challenges of urbanization is One of the most significant challenges associated with rapid urbanization is the emergence and expansion of informal settlements. These settlements lack secure land tenure, basic infrastructure (water, sanitation, electricity), and access to essential services like healthcare and education. Their existence reflects the complex interplay of factors driven by economic, social, and environmental pressures (Kookana et al., 2020).

Causes of informal settlements which are the rise of informal settlements are intricately linked to the challenges of urbanization. Key contributing factors include rapid population growth which is outpacing the capacity of cities to provide adequate housing and services, leaving many seeking shelter in informal areas. Rural-urban migration which are driven by poverty, unemployment, and limited opportunities in rural areas, prompting people to seek a better life in cities. Inadequate housing affordability which is the cost of formal housing in cities often exceeds the means of many new residents, forcing them to seek cheaper alternatives in informal settlements. Limited urban planning which is weak planning, insufficient investment in infrastructure, and a shortage of affordable housing options contribute to the expansion of informal settlements (Alene, 2022).

The phenomenon of informal settlements is a global concern. It is estimated that over one billion people worldwide live in informal settlements, representing a significant proportion of the urban population. Africa, with its rapid urbanization and high poverty rates, is disproportionately affected. It is estimated that over 60% of Africa's urban population resides in informal settlements (Agyabeng et al., 2022).

The main adverse effect of urbanization is the rapid, often unofficial, expansion of urban centers into rural and agricultural areas. Large-scale population shifts from rural to large urban areas have plagued developing nations, resulting in an increase in informal settlements and socioeconomic problems for cities (Nouri A. Elfarnouk, 2015). Therefore, the unlawful occupancy of urban land is one of the confusing issues that many emerging nations are currently facing. Most people refer to this as "squatting." The main reasons of it are the rapid population expansion in the country, the migration of people into cities, and the inability of the impacted countries to supply the land and houses required to handle the influx of newcomers.

Urbanization stands as an irreversible global phenomenon that has transformed landscapes, economies, and societies. As populations continue to migrate towards urban centers in pursuit of economic opportunities, social amenities, and enhanced living standards, cities like Adama become focal points of this transformative trend. Adama currently undergoing rapid urban growth grapples with the repercussions of haphazard and often unlawful construction, leading to the emergence of informal settlements (Kumar, Kuldeep., Devendra, Pratap, 2023). Ethiopia is experiencing rapid urbanization, with its urban population steadily increasing. While Addis Ababa, the capital, has received considerable attention regarding informal settlements, the problem extends to other rapidly growing cities across the country, including Adama.

According to Menwuyelet Melesse (2005), there are a number of reasons why squatter communities have developed in Addis Ababa, including delays in the distribution of legal land, delays in the implementation of legal housing, and rises in the cost of housing rent in urban areas. Along with those economic factors, he added, there are political and legal failures that stand in for the lack of government action to organize and manage open spaces, the absence of code enforcement services to regulate and control the emergence of illegal house

construction, the lack of inclusive legal responses to the ongoing emergence of the squatting phenomenon, and the failure to regulate and legalize land speculators' practice of profiting from the sale of their properties (Pomaza-Ponomarenko et al., 2023).

In Adama, informal settlements are a growing concern, fueled by a combination of factors are High Internal Migration which is driven by the search for employment opportunities and access to services in Adama. Limited Affordable Housing which is the growing demand for housing often outpaces the supply, particularly for low-income residents. Inadequate Urban Planning and Infrastructure which is limited investment in urban development, coupled with a lack of robust planning, has contributed to the expansion of informal settlements (Abagissa, 2019).

The impact of informal settlements which is the presence of informal settlements has significant ramifications for urban development and the quality of life for residents are strained services which is Informal settlements put immense strain on existing infrastructure (water, sanitation, electricity) and public services (healthcare, education, security) in Adama. Security concerns which is overcrowding and lack of safety regulations in informal settlements increase vulnerability to crime, fires, and other hazards. Livelihood challenges which is residents of informal settlements often struggle to find stable employment, secure land tenure, and access essential resources for their livelihoods, contributing to poverty and inequality (Agyabeng et al., 2022).

The overlooked impact on livelihoods is crucial to recognize that the impact of informal settlements on livelihoods is often overlooked. The lack of access to secure land, employment opportunities, and basic resources for livelihood activities perpetuates a cycle of poverty and vulnerability for residents (Mengistu & Belda, 2024). This study aims to shed light on these overlooked impacts and provide a more comprehensive understanding of the challenges faced by residents of informal settlements in Adama.

This study examines the factors that contribute to the development and spread of informal housing as well as the advantages and disadvantages of the issue in Adama's Boku Sub-City. It's noteworthy that no previous research has specifically looked at the topic of "Assesses the challenges and Consequences of informal settlement on the environment and livelihood of the

community: The Boku Shanan Sub-City's Adama Town Case". The circumstances surrounding informal dwelling in Boku Sub-City and the variables influencing the emergence and spread of unlawful occupation are clarified by this study. The investigation is considered significant considering the obstacles to the city's development that the growth of informal settlements presents.

1.2. Statement of the Problem

The rapid growth of informal settlements in Adama city is a pressing issue, yet there is a lack of comprehensive understanding of the specific factors driving this phenomenon. The absence of in-depth research hinders the development of effective policies and interventions to address the root causes of informal settlement expansion. Without a clear understanding of these contributing factors, it is challenging to implement targeted and sustainable solutions to mitigate the growth of informal settlements in Adama (Abagissa, 2019).

The socio-economic and environmental impacts of informal settlements on Adama city and its residents are not well-documented or understood. There is a need for comprehensive research to assess the implications of informal settlements on health, livelihoods, social cohesion, and environmental sustainability. Without a thorough understanding of these consequences, it is difficult to design and implement effective policies and interventions to improve the well-being of residents living in informal settlements and mitigate the negative impacts on the broader urban environment (Mohammed, 2021).

Informal communities in Ethiopia are referred to as "Chereka Bet", meaning "moon house," reflecting the clandestine nature of their illegal construction, often carried out at night without municipal permission or construction permits. Adama, as a commercial hub and conference center for Ethiopia, has attracted a considerable influx of people from surrounding regions and other urban areas. However, the illegal construction of houses, known as "mana addressaa," conducted primarily at night, poses a significant challenge to urban land management in Adama (Abagissa, 2019).

According to data from municipal administrations, most cities have a significant amount of informal growth relative to planned city expansion, with a lower percentage of formal participation. For example, in 2013 there were 60 ha of land developed for legal expansion,

and 758.89 ha of land developed for informal growth, meaning that the ratio was 1:13. The years 2010 (1,595.68 ha), 2011 (1,366.01 ha), and 2012 (1,138.34 ha) had the greatest amounts of informal expansion in Adama (City Report, 2015). Furthermore, it was stated in 2016 that 37,000 houses in Adama were constructed unlawfully, with Boku Sub-city displaying the highest level of informality (Haile G, 2018).

The expansion of informal settlements in Adama city poses significant challenges to existing urban infrastructure and services, including water, sanitation, transportation, and public facilities. However, there is a lack of research that comprehensively evaluates the specific impacts of informal settlements on infrastructure and services. Without a clear understanding of these impacts, it is difficult to develop targeted strategies to enhance the resilience and functionality of urban infrastructure in areas affected by informal settlements (Agyabeng et al., 2022).

The absence of research on effective strategies for transforming informal settlements into integrated and resilient urban areas in Adama is a critical gap. Without a robust understanding of successful approaches and best practices, policymakers and urban planners face challenges in identifying and implementing sustainable solutions. Research is needed to identify and evaluate potential strategies, drawing from both local and international experiences, to guide the transformation of informal settlements into more inclusive and sustainable urban spaces in Adama city (Peter Ngau, 2012).

Thus, this paper explores the issue and effects of the growth of informal settlements in urban areas and suggests potential remedies to support the social, economic, and environmental development of the city.

1.3. Objective of the study

1.3.1. General objective of the study

The primary objective of this research is to investigate and analyze the challenges and consequences of informal settlements on the environment and livelihood of the community in Adama Town, Boku Shanan Sub-City and propose sustainable solutions for their mitigation and transformation.

1.3.2. Specific objectives of the study

The specific objectives of this study are to:

- Identify factors contributing to the growth of informal settlements in Adama city.
- Assess the socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services.
- Assess the strategies that can be implemented to transform informal settlements into integrated and resilient urban areas.

1.4. Research Questions

In relation to the research questions, this study seeks to answer the following questions:

- What are the key factors contributing to the growth of informal settlements in Adama city?
- What are the socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services?
- What are sustainable strategies that can be implemented to transform informal settlements into integrated and resilient urban areas?

1.5. Scope of the study

The scope of this study would focus on challenges and consequences of informal settlements on the environment and livelihood of the community in Adama city, which is a town divided into six sub-city Administrative units. The study conducted in the informal settlement residents that are located in Adama, Boku Shenen sub-city. It would encompass a comprehensive analysis of the key factors contributing to the growth, the socio-economic, environmental consequences and impacts, and infrastructural aspects of informal settlements. Additionally, the research would explore the existing policies and interventions related to informal settlements in Adama.

1.6. Significances of the study

This research is significant for several reasons. It provides insights into the specific challenges posed by informal settlements in Adama city, contributing to the knowledge base for urban planning and development. The findings would inform policymakers, urban planners,

researchers and community stakeholders about the consequences of informal settlements and provides sustainable strategies to address these challenges. Ultimately, the study aims to contribute to the creation of a more sustainable, inclusive, and resilient urban future for Adama.

1.7. Operational Definitions

In this study, several key terms are defined operationally to provide clarity and consistency in their interpretation.

- **Urbanization:** it is shift of population from rural areas to cities, and the resulting growth of urban areas (Mahtta et al., 2022).
- **Informal settlement:** An informal settlement is a type of housing area that is typically characterized by a lack of formal planning, inadequate infrastructure, and poor living conditions. These settlements are often built by people who do not have access to affordable housing or who are unable to afford formal housing options (Agyabeng et al., 2022).
- **Sustainable Urban Future:** A city development approach that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs, emphasizing social equity, economic prosperity, and environmental stewardship (Mersal, 2016).
- **Challenges:** Obstacles and difficulties faced by the city and its residents due to the existence and growth of informal settlements (Kamana et al., 2024).
- **Consequences:** The direct and indirect outcomes of informal settlements, including social, economic, and environmental impacts (Mohammed, 2021).
- **Urban Infrastructure:** The physical and organizational structures and facilities that support the functioning of the city, such as transportation, water supply, and sanitation systems (UNOPS, 2019).
- **Environment:** The environment refers to the natural world around us, including the air, water, land, and all living organisms. It also includes the physical, chemical, and biological factors that affect these elements (Balasubramanian, 2008).
- **Livelihood:** is a set of activities essential to everyday life that is conducted over one's life span (Serrat, 2017).

- **Community:** A community is a group of people who share common interests, values, and goals. This can include people who live in the same area, work in the same industry, or share a common culture or language (Cobigo et al., 2016).

1.8. Limitation of the Study

Some limitations to consider for this study focusing on the environmental and livelihood impacts of informal settlements in Adama Town, Boku Shanan Sub-City: Limited access to comprehensive data that is obtaining accurate and detailed data on environmental impacts (e.g., waste generation, air and water pollution, land degradation, biodiversity loss) in informal settlements can be challenging due to the lack of comprehensive monitoring systems. Gathering reliable data on income levels, employment patterns, access to resources (water, sanitation, healthcare), and land tenure security within informal settlements can be difficult due to the informal nature of many activities and the potential for underreporting. Limited access to historical data on environmental conditions, migration patterns, and livelihood trends in the study area can hinder the ability to understand long-term changes and impacts. Focus on Boku Shanan Sub-City which is the study's scope might not fully capture the broader context of informal settlements in Adama Town or the region, limiting the generalizability of findings. By acknowledging these limitations and taking proactive steps to mitigate them, the study can produce valuable insights and recommendations for addressing the challenges of informal settlements in Adama Town, Boku Shanan Sub-City, leading to more sustainable and equitable development for the community.

1.9. Organization of the Thesis

The cover page, title page, approval sheet, acknowledgment, table of contents, list of tables, list of figures, acronyms, and abstract comprised the preliminary pages of the thesis document. The body section is divided into five chapters, each of which contains a variety of connected but distinct subtopics. The background data, problem statement, objectives, research questions, significance, scope, operational definition, limitations, and study organization are all included in the introduction section, which is covered in the first chapter. The section on the literature review was contained in the second chapter. Research methodologies, sample size determination, demographic and sampling frame, research methodology, research design, data collection and analysis methods, validity and reliability,

and ethical considerations are all covered in the third chapter on research methods and materials. The study's results and discussion section, which focuses on data presentation and discussions, are covered in the fourth chapter. This detailed how the mixed research approach was used to analyze the primary and secondary facts. The study's results and recommendations were presented in the final chapter.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Introduction

The literature review relevant to the research that will be employed in the investigation is described in this topic. These comprise study theories, concepts, and ideologies that are relevant to the theoretical and empirical problems of the effects of informal settlements on the local environment and way of life.

2.2. Conceptual Definition of Informal Settlements

The fast-expanding city of Adama, which is situated in Ethiopia's Oromia region, is dealing with issues like incorrect land use and informal settlement. Due to rural-urban migration, the city has seen tremendous population expansion in recent years, which has led to the rise of informal settlements around the city. Slums and other informal settlements have emerged in the city as a result of improper planning and management of urban growth. These areas are typified by subpar housing, a dearth of essential services, and poor sanitation.

A literature review on this topic reveals that the causes of informal settlements and improper land use in Adama City are complex and multifaceted. Some studies attribute it to the lack of proper urban planning, inadequate enforcement of zoning regulations, and limited access to affordable housing. Others suggest that rural-urban migration and population growth have also contributed to the issue.

One study by Gebreslassie and Gebremedhin (2018) examined the challenges of urban land management in Adama City. They found that the city lacks an adequate land administration system, which has led to illegal land grabbing and the development of informal settlements. The study also highlighted the need for more effective urban planning and the enforcement of land use regulations to address these issues.

Another study by Mamo et al. (2017) investigated the environmental impacts of informal settlements in Adama City. The study found that informal settlements contribute to deforestation, soil erosion, and pollution of water sources. The authors recommend that expanding access to necessities like water and sanitary facilities, as well as promoting sustainable land use practices, could help mitigate these negative impacts.

A study conducted by Gebrehiwot and Woldemichael (2020) examined the factors contributing to the proliferation of informal settlements in Adama. The study found that rapid urbanization, lack of affordable housing, inadequate government policies and regulations, and lack of proper planning were the main factors contributing to the emergence of informal settlements. The study also found that the residents of informal settlements in Adama faced significant challenges related to access to basic services such as water, sanitation, and electricity.

Another study by Terefe and Gebrehiwot (2021) focused on the impact of improper land use on the urban environment in Adama. The study found that the improper use of land, including encroachment on public land, unauthorized construction, and the conversion of agricultural land to urban use, had significant negative impacts on the environment and urban sustainability. The study also found that improper land use had resulted in the degradation of natural resources such as water, soil, and vegetation.

A study by Tsega et al. (2019) examined the challenges facing the provision of basic services in informal settlements in Adama. The study found that the lack of basic services, including water, sanitation, and electricity, was a major challenge facing residents of informal settlements in the city. The study also found that the provision of basic services in informal settlements was hampered by a lack of government support, inadequate funding, and poor planning and management.

2.2.1. Definition of Informal Settlements

Seldom is there a clear explanation of what informal settlement is in existence. Squatter communities have been referred to by a number of different names throughout literature. These comprise impromptu, erratic, unplanned, fringe, and unofficial settlements. The term "informal settlements" has several definitions. The labels "spontaneous," "unplanned," "unauthorized," illegal, or squatter settlements have been used to describe uncontrolled, unlawful, and unauthorized development that results from the laws and rules in various countries. Unplanned settlements, where housing is not in compliance with current planning and building regulations (unauthorized housing), and residential areas where a group of housing units has been built on land to which the occupants have no legal claim or which they occupy illegally are both considered informal settlements according to the United

Nations (United Nations, 2015).

According to Daniel (2013), informal settlements are populated areas made up of groups of people living in self-built homes under customary or informal land tenure. These are typical characteristics of emerging nations and are usually the result of the urban poor's desperate need for housing. Because of this, they are distinguished by a significant increase in the number of tiny, improvised shelters made of a variety of materials, the deterioration of the surrounding ecology, and serious social issues. Furthermore, according to the Vienna Declaration (2004), which was cited by Bogdan and Daniel (2013), informal settlements are defined as human settlements that exist in their respective countries and impede economic development but, for a variety of reasons, do not meet the requirements for legal recognition (having been constructed without respecting formal procedures of legal ownership, transfer of ownership, as well as construction and urban planning regulations). These settlements are primarily defined by informal or unstable land tenure, insufficient access to essential amenities, both social and physical infrastructure, and housing finance, notwithstanding substantial geographical variability in their manifestation.

2.2.2. Characteristics of Informal Settlements

The definition makes clear the traits of informal settlements. According to Sirgut Gezahengn (2013), squatter settlements are distinguished by three interconnected and fundamental characteristics. Among the traits are: Physical characteristics: The infrastructure and services in squatter communities are subpar. They might not be related to deaths from roads, drainage, sewers, electricity, or water supplies. Lack of security services, such as fire and police protection, makes it insecure. Additionally, squatter colonies are constructed on marginal land along rivers, dump areas, and the edges.

The primary attribute that distinguishes a squatter colony is the absence of ownership of the land parcel occupied by the settlers. These could be marginal property parcels such as railroad setbacks or "undesirable" swampy areas, or they could be empty government or public land. Social aspects: Informal laborers and low-income people reside in squatter communities. The majority of the population works part-time or performs daily labor, and their average salary is quite low. The majority of squatters are either second or third generation squatters, or migrations from rural to urban or urban to rural areas. Legal aspects:

Since squatters occupy public land without a permit, squatter colonies are by definition illegal. In addition, a study carried out in Kenya found that all informal settlements have the following common characteristics: (1) insecurity of tenure; (2) lack of planning; (3) lack of infrastructure (e.g., roads, water pipes, drainage systems, toilets, waste collection, electricity); (4) poor environmental condition; (5) lack of public facilities (schools, dispensaries); and (6) unemployment and poverty (Pellikka, Ylhäisi & Clark (eds. 2004).

As the research, findings of Pekka, (2004) on the informal settlements in Helsinki (Kenya) put the characteristics of informal settlements. The uncertainty of land property right, deficient in public facilities and dispensaries, houses developments in the spontaneous area, unhealthy environmental situation un-employment and poverty (Pekka, 2004). There are varieties of criteria for identifying informal settlement among them: to lack of basic services, poor building structures, overcrowding, shanty and hazardous conditions, insecure tenure, poverty, and exclusion (Ghasempour, 2015).

The astounding rate of social and demographic change in most developing-nation cities has placed a heavy weight on the populace and government. The necessary funding falls short of the peoples' expectations and the government is not providing enough services. Not just the local government finds it problematic when there is a lack of road infrastructure and other necessities, even when it puts international investors in a difficult situation. Instead of expensive formal urban land, people have chosen to build their homes on farms closest to towns or cities. It can be a management issue, requiring strong collaboration between the government, housing services, and other sectors (Ayman, 2011).

Physical characteristics of an informal settlement include inadequate or nonexistent infrastructure and services, such as roads, drainage systems, schools, health centers, markets, and social infrastructure like electricity and water supply (Ampofo et al., 2024). These are caused by the informal settlement's intrinsic "non-legal" status. For instance, a household may not have access to water, there may not be many public or community pipes available, or water is supplied manually using a hand pump or city networks. Unofficial water delivery networks can also exist; see World Bank. The low-income population that works in numerous enterprises in the industry or is employed in waged or salaried job is the social characteristic of informal settlements. The majority of them make at least the minimum

salary on average. Owing to earned income and part-time employment, the household income level may also be high. Urban or urban-rural migrants make up the bulk of informal settlers (Yassin, 2020).

2.2.3. History of Informal Settlements

Informal settlements have a varied history and evolution, ranging from slums to standardized residences, from suburban areas to secure city centers, and from small units to large multi-story buildings as well as single-family homes to settlements with over 50,000 residents. In addition to other legitimate causes, the migration of people from rural regions, as well as the arrival of refugees and internally displaced persons, has led to irregular and unlawful building in major cities. In addition to meeting their immediate housing needs, many households have turned to illicit real estate investments as a buffer against instability and hyperinflation. According to Bañez-Coronel et al. (2018), these places frequently lack roads, basic infrastructure, and social institutions like schools, hospitals, and safe access to water, which contributes to the development of suburban neighborhoods.

Similarly, a number of research findings clarified that informal settlement is a worldwide phenomenon that poses problems in both industrialized and developing nations, while the existence, severity, nature, and underlying causes of the issue vary from one nation to the next. Even inside the same nation, an unofficial community going by several names. The number of squatters has dramatically increased in recent years due to factors such as poverty, the high cost of the formal urban land market, the rise in urban population in third-world nations, and poor governance. In most African cities, squatter families with the greatest deprivation of shelter can be seen either in the heart of the city or on its outskirts (Bimalkanta, 2013).

The many research studies show that there is less government control over open spaces, higher housing rentals in the city center, late answers, procedural issues with the legal land provision, and high building standards of the legal dwellings. One of the main mechanisms to prevent unauthorized housing is law enforcement. People at the time opposed government interference, but those who benefitted from it did favor the ideals. Lack of comprehensive legal solutions, legal land provision, and the issue of the built-up area of the city or town expanding horizontally that is, expanding the urban area without terminating the area zone so

that rural and urban regions merge are the main causes of informal settlement. Over time, marginalized people's homes become illegal due to a lack of prompt actions from the government, local governments, and planners (Mohammed, 2021 and Kelemu, 2016).

According to Daniel, a variety of social, economic, and political issues have contributed to the emergence of the informal settlement. The following is a description of the key elements from an international standpoint. One is the socioeconomic causes, which include the scarcity of housing, the rise in urban poverty, and the high rate of migration from rural to urban areas (rural poverty or factors that motivate people to relocate to urban areas), the high unemployment rate, and the high or rising cost of living in comparison to economic decline. Two, institutional factors include bad situational setup and lack of coordination, unclear regulations and lengthy procedures, corruption, a lack of accountability and transparency, poor enforcement, exploitation of public land, and a lack of technical manpower and financial resources. Three political elements, including colonization's influence, inadequate policy, less attention to urban issues, civil war, and a lack of prompt remedies (segregation), among others.

2.2.4. Theories and Approaches in Informal Settlements

There are three primary hypotheses that are widely addressed in industrialized countries regarding urban settlements. First, the Chicago School of the 1930s saw informal settlements as a sort of residential heterogeneity brought about by the disparities in affluence between various ethnic groups vying for attractive or valuable urban land. Second, according to Alonso's neo-liberal theory of slums, informal settlements are an answer to the housing demands of urban residents who are unable to purchase a permanent residence because of biased municipal laws and government funding. Lastly, informal settlements are seen by post-modern theory of the urban landscape, or factorial ecology, as the result of people settling in urban areas based on their social position and occupation (Hardyns & Pauwels, 2017). Four major theories, however, have been identified as relating to land management, the colonial legacy, inadequate economies, and demand and supply disequilibrium in developing countries. Specifically, the first theory holds that the informal urban areas are caused by poor land management practices, ineffective urban planning schemes, and inefficiency on the part of urban authorities. The second theory, on the other hand, connects

the expansion of informal settlements to historical and political factors, particularly colonialism, postcolonial practices, and civil and political instability (Laura, 2014).

According to a third perspective, the emergence of informal settlements has been significantly influenced by the implementation of a new economic system. According to this view, residential discrimination and social exclusion resulted from the development of urban trade, income, and class disparities that translated geographically. According to a fourth theory, the disequilibrium between the supply and demand of urban commodities, such as land, infrastructure, and services, accounts for the formation and expansion of informal settlements. This point of view investigates the longevity and durability of informal settlements and suggests that, even as efforts are made to ameliorate slums, new informal settlements are sprouting up all over the city (Ashenafi, 2015).

Additionally, there are other options. The first is the self-help housing plan, which has grown to be one of the well-known methods for providing low-income housing in developing nations. The Development Bank of South Africa DBSA (1994) defines a self-help scheme as an urban poor household's (individual or group's) process of improving their standard of living through their own resources, such as labor, savings, and management skills, without receiving financial assistance from the government. It appeals to the urban poor because it upholds the proverb "God helps those who help themselves" and because self-housing initiatives inside housing fraternities foster the socioeconomic development of families and communities by enhancing their capacity for self-assurance, management, and decision-making. The urban WB development policies have inspired three distinct types of self-housing plans. Unaided self-help that arises naturally: families take care of their own needs on their own without outside help. Assisted self-help is when a group of people support one another by getting outside help in the form of money, expertise, or building supplies; Mutual aid is when individuals or groups assist one another in meeting their housing needs through the provision of private, semi-private, and other forms of support, such as the improvement of informal settlements and basic services. The second strategy is the development of sites-and-services housing schemes, which have been around for a while as a way to address issues with low-income housing. These schemes are defined as the provision of land plots on either an ownership or land lease basis on top of the barest minimum of infrastructure

suitable for human settlements; these models predate both the coinage of the phrase and the World Bank's decision to endorse them. In addition, the models sought to house the urban poor by increasing the number of permanent households, cutting public spending, displacing informal settlements and the ensuing tax implications, developing a dependable construction sector for employment opportunities, and empowering the burgeoning small business sector (Bañez-Coronel et al. 2018 and Tshikotshi, 2014).

2.2.5. Consequences of Informal Settlements

Seen in a larger context, the collective weight of informal settlement has fundamentally harmed cities, the populace living in them, and the informal settlement inhabitants themselves. There are substantial and diverse legal, social, political, environmental, and economic repercussions to the phenomena. Informal settlements in cities are a contributing factor to environmental degradation, health problems, urban violence, and social instability. In this regard, different authors have seen different consequences of squatter settlements in different parts of the world (Mostafa, 2000). Among the social, physical, hygienic, political, security and financial damages it causes are the increases in drug abuse, prostitution, alcohol consumption, crime, and homicide. Physical harms include haphazardly constructed homes, disorganized building facades, and their negative impacts on the look and reputation of cities. Squatter settlements in developing nations are situated in prospective city expansion zones, which impede planned development and lead to the misappropriation of infrastructure and land resources.

2.3. Empirical Literature Review

Empirical studies have investigated the issue of informal settlement and improper land use in Adama city from various perspectives. The following are some of the key findings from these studies:

A study by Sileshi and Tariku (2016) found that the rapid urbanization of Adama city has led to the development of informal settlements in areas designated for other purposes, such as agricultural land and open spaces. The study identified a lack of enforcement of zoning regulations as a key factor contributing to this challenge.

A study by Fisseha and Tadesse (2017) examined the causes and consequences of informal

settlements in Adama city. The study found that poverty and lack of affordable housing were major factors driving the development of informal settlements. The study also identified the negative impacts of informal settlements on the environment, social cohesion, and access to basic services.

A study by Woldegiorgis and Abebe (2018) investigated the factors that contribute to improper land use in Adama city. The study identified a lack of comprehensive planning and inadequate enforcement of land use regulations as major factors contributing to this challenge. The study also found that improper land use had negative impacts on the environment, public health, and safety.

A study by Goshu et al. (2021) examined the social and economic impacts of informal settlements in Adama city. The study found that informal settlements had negative impacts on the social and economic well-being of residents, including limited access to basic services, increased risk of disease outbreaks, and reduced economic opportunities.

Overall, these empirical studies highlight the complex nature of the challenges and consequences of informal settlements in Adama city. They suggest that addressing these challenges will require a comprehensive approach that addresses the root causes of the issues, such as poverty, inadequate planning, and weak enforcement of regulations. The studies also emphasize the negative consequences and challenges of informal settlements on the environment, public health, and social and economic well-being of residents, underscoring the importance of finding sustainable solutions to these challenges.

2.4. Factors contributing to the growth of informal settlements

Edwin and colleagues (2012) found that the growth of informal settlements is facilitated in part by industrialization, poverty, unemployment, and population growth in the community. The study also demonstrated that adequate attention must be paid to the issues of Mombasa County's industrialization, poverty, unemployment, and population growth in Changamwe Constituency in order to address the issue of the informal settlements' proliferation.

According to Alene (2022), study indicated that the factors contributing to the growth of informal settlements in the extant literature and therefore bring together a set of most notable factors contributing to the growth of informal settlements presented as shown in table 2.1.

Table 2. 1: Factors contributing to the growth of informal settlements

Factors
Inability to afford the price of land in the formal market
High housing rent at the center
Income disparity
Land speculation through brokers
Insufficient compensation paid to peri-urban farmers during their land expropriation
Land substitution modality for previous informal settler after eviction
Educational level
Poverty and economic inequality
Inconsistency in land and plan legislation
Rigid building regulation for legal houses
Population growth due to natural increase and migration
Inadequate housing policy
Current political situation of the country
Corruption in relation to land provision by the leaders
Inefficient public administration
Procedural problem of legal land provision

Source: Alene (2022)

There are numerous significant interconnected issues that are significantly related to critical aspects driving the emergence of informal housing development. The main reasons of informal settlements are poverty, sociocultural issues, inappropriate land distribution, lack of resources, fast urbanization and population influx, absence of development control mechanisms, and lack of formal land distribution. Extraneous bureaucracy for land permissions and development, unrealistic zoning regulations and inadequate planning, inconsistent and complex laws, marginalization, the expansion of informal settlements is frequently attributed to a number of issues, including poverty, a lack of affordable housing finance channels, Political resistance to addressing the issue, building and unauthorized subdivision of agricultural property, and a deficiency of vital geographical data (Yassin, 2020).

According to Bañez-Coronel et al. (2018), study indicated that the major cause of informal

settlements are Lack of comprehensive legal responses, Informality of land tenure, High cost of formal urban land market and cheap land Market with the farmer and Government financial problems.

2.5.Socio-economic and environmental consequences of informal settlements

According to Bañez-Coronel et al. (2018), study indicated that the consequences of informal settlements are Health problems (water Born diseases and problems of food storage the facilities), Resource depletion and problem of sewerage disposal lead to pollution of physical environment deterioration (loss of agricultural land, water and air pollution, pollution of water sources such as river and ground water) and Irregular settlement.

Informal settlements, also known as slums or shantytowns, are characterized by inadequate housing, lack of basic services such as water and sanitation, and poor living conditions. These settlements are typically found in urban areas and are often the result of rapid urbanization, poverty, and lack of affordable housing options. The socio-economic and environmental consequences of informal settlements are significant and have been the subject of numerous studies in the literature (Tilaki et al., 2011).

Socio-economic consequences are poverty and inequality which is informal settlements is often home to the poorest and most marginalized populations, leading to high levels of poverty and inequality. Residents of informal settlements typically have limited access to education, healthcare, and job opportunities, perpetuating the cycle of poverty (K. Melehy, 2023). Health risks which are the lack of basic services such as clean water, sanitation, and healthcare in informal settlements leads to increased health risks for residents. Poor sanitation and overcrowding can contribute to the spread of diseases such as cholera, malaria, and tuberculosis (Hossain, 2020). Social exclusion which is residents of informal settlements often faces social exclusion and discrimination, leading to limited social mobility and opportunities for advancement. This can further exacerbate poverty and inequality within these communities (Tilaki et al., 2011).

Environmental consequences are poor waste management which is informal settlements often lack proper waste management systems, leading to the accumulation of garbage and pollution in the environment. This can have negative impacts on public health and the

environment, contributing to the spread of diseases and environmental degradation. Deforestation which is informal settlements is often located in environmentally sensitive areas such as forests or wetlands, leading to deforestation and loss of biodiversity. The clearing of land for housing construction can also contribute to soil erosion and other environmental problems. Water pollution which is the lack of proper sanitation facilities in informal settlements can lead to contamination of water sources, posing a risk to public health and the environment. Polluted water can also impact agriculture and other economic activities in the surrounding areas (City, 2014; Tilaki et al., 2011).

Overall, the socio-economic and environmental consequences of informal settlements are complex and interconnected, requiring holistic approaches to address the underlying causes and improve living conditions for residents. Efforts to upgrade informal settlements through improved housing, infrastructure, and access to basic services can help mitigate these consequences and promote sustainable development in urban areas.

2.6.Impact of informal settlements on the existing urban infrastructure and services

According to Bañez-Coronel et al. (2018), study indicated that the Positive impact of informal settlement low-income group of peoples settled as temporary residing area. Informal settlers doing the activities without paying a government tax this benefit for the residents and opportunities for some people to improve their life style easily. Negative impact; the illegal settlers are obstacles in the settlement legalization process (to give compensation and supply public services).Informal settlers, they do not have confidence to invest as permanent settlers. Psychologically they feel lose and weak integration of the residents with formal settlers. Remedial actions to diminish illegal settlement legalization of housing and infrastructural development play a great role for the development of town and good opportunities for the residents. Legalization of houses by cooperating the residents (relocation and settlement upgrading depending on the problems happen) addressing of houses with low cost especially for the poor's. Otherwise demolishing of informal settlement without prioritizes condition it is painful for residents. Because they are living with and generating income but after the demolishing of houses those of the residents are may the loser. To conclude that informal settlement is negative impacts rather than the positive and affects for the development of the town.

According to Yassin (2020), study indicated that the city's development is impacted by informal settlement in a number of ways, encompassing the environmental, social, economic, and physical domains. In terms of the physical environment, informal settlements result in unplanned, spontaneous growth, poor housing development, and expansion of unplanned regions, insufficient infrastructure, and a dearth of essential services. It gets harder to incorporate these villages into the current city layout as a result. Social impact: Land disputes (between original settlers' families and between land sellers and buyers), overcrowding, a lack of legality for this type of crime, which has an impact on people's social behavior, and a lack of integration between locals and formal institutions are one of the area's social impacts. Economic impact: The government or municipality loses a lot of money because most parcel sizes are enormous. The development of the city is impacted by this. Environmental impact: The city's built-up area increased by 293% based on Landsat images acquired between 1984 and 2015. This shows that there has been a considerable loss of agricultural land, deforestation in the adjacent peripheries, and deforestation in rural forest regions utilized for building materials and firewood as a result of the existence of informal settlements in these towns. The cumulative consequences of the informal settlements on the environment, law, economy, and society hindered the growth of the city of Adama.

According to Nixon (2020), study indicated that there are numerous obstacles to overcome when analyzing the environmental effects of projects in "developing" nations, including a dearth of baseline data, poor data quality, insufficient environmental regulations, and a propensity to withhold or conceal results. These difficulties arise when an attempt is made to apply EIA principles to evaluate the effects of an informal settlement and then decide whether the community could continue to live there with sufficient mitigation given their high level of social, economic, and cultural capital. Building on the idea of "living heritage," this study argues that the Hue Citadel World Heritage site would lose some of its appeal to visitors if there was no sense of community. As an alternative, it suggests that an infrastructure upgrade plan be created and carried out in collaboration with the community, aid organizations, and local authorities. This plan would help address the environmental challenges at the site and permit the community to continue living in the Citadel. The plan would involve an adaptation of the EIA process to an informal settlement context and a compilation of all existing infrastructure upgrade proposals.

According to Mohammed (2021), study indicated that the term "informal settlement" describes a scenario where residents lack essential utilities and other socioeconomic infrastructure, have no security of housing or land ownership, and live in homes that do not adhere to current construction codes and planning requirements. Slums are the most marginalized type of informal settlements. Factors such as population growth, rural-to-urban migration, poor government policy-making, planning, and management of urban land, and the inability to provide solutions for displacement brought on by natural disasters, conflict, and climate change are all interconnected and contribute to the informal settlement problem.

2.7.Sustainable strategies that implemented to transform informal settlements

According to Mohammed (2021), study indicated that the sustainable strategies for implemented to transform informal settlements are creating and overseeing the institutional framework for handling housing-related concerns, Create and implement clear administrative processes, norms for rules, and a campaign to educate people about informality.

According to Yassin (2020), study indicated that numerous strategies and techniques to eradicate this occurrence. A few of these techniques are detrimental to the general public. Therefore, in order to manage the backlog of housing for informal settlements in the city as well as the problems these settlements present, the government should provide the necessary regulations and laws to regularize the current informal system and enable sustainable applications to offer effective solutions.

According to Msimang (2017), study indicated that must be sustainable, integrated, and continue to advance in terms of development. More employment possibilities and affordable housing for the underprivileged are needed, as these could assist move the environment in the correct direction. Individuals who move to cities from rural regions in pursuit of greater opportunities require assistance. There is a possibility that the housing problem and the environmental effects of informal settlements can be resolved if the issues of employment possibilities, access to quality healthcare, and educational chances are addressed in rural areas. There won't be a need for the growth of informal settlements if opportunities are available where people are, in this case, in rural areas, eliminating the need for people to travel to urban areas in search of them.

2.8.Gaps of the Study

Gaps of the research:

- Lack of detailed analysis on the role of government policies and urban planning in fostering or hindering the growth of informal settlements. For example, are there specific land-use policies or development plans that unintentionally promote informal settlements?
- Insufficient understanding of the interrelationships between migration patterns, economic opportunities, and informal settlement growth. For instance, how do specific job sectors or economic activities attract migrants to Adama, and how does that influence the creation of informal settlements?
- Limited research on the impact of climate change and environmental degradation on migration patterns and the growth of informal settlements in Adama. How do factors like drought, land degradation, or natural disasters influence the movement of people to urban areas and contribute to informal settlement formation?
- Lack of quantitative data on the economic impacts of informal settlements. For example, how do informal settlements contribute to the city's economy (through informal employment, trade, etc.), and how does that impact local businesses and formal economic activity?
- Insufficient understanding of the specific health impacts of living in informal settlements, including the relationship between environmental factors (water quality, air pollution) and disease prevalence.
- Limited research on the social consequences of informal settlements, such as community cohesion, social networks, and the role of informal social institutions in mitigating challenges.
- Lack of detailed analysis on how informal settlements strain specific infrastructure systems (e.g., water supply, sanitation, transportation). How do informal settlements affect the capacity, efficiency, and maintenance of these systems?

- Limited research on the impact of informal settlements on service delivery, particularly in terms of accessibility and quality of healthcare, education, and public safety for residents. How do these services reach residents in informal settlements, and what are the barriers to access?
- Insufficient understanding of how informal settlements affect the urban landscape and spatial development of Adama. How do informal settlements influence the layout, growth, and overall planning of the city?
- Lack of empirical evidence on the effectiveness of different intervention strategies used in other contexts. For example, how have programs for upgrading informal settlements, providing land tenure security, or fostering economic opportunities fared in other cities, and what lessons can be learned?
- Limited research on the role of community participation and local governance in successful transformation efforts. How can residents be actively involved in planning and implementing interventions?
- Insufficient understanding of the long-term sustainability of transformation strategies. What are the financial and resource implications of implementing and maintaining these strategies over time, and how can they be ensured?

By addressing these research gaps, your study can provide more nuanced and comprehensive insights into the challenges and potential solutions for informal settlements in Adama, Boku Shanan Sub-City.

CHAPTER THREE

3. Methods and Materials

3.1.Introduction

The research methodology and materials used in the study are described in this chapter. These consist of the research area, methodology, design, population and sampling frame of the study, sampling strategy, sample size estimation, data collection method, data analysis procedures, questionnaire validity and reliability tests, and ethical considerations. Excel and SPSS software were used to evaluate the data that had been gathered. A mixed research technique, including qualitative and quantitative methods, was chosen as the research methodology because it was deemed the most suited for this particular study.

3.2.Description Study Area

The study area of Adama Town, specifically the Boku Shanan Sub-City, presents a complex set of challenges and consequences related to informal settlements that have significant impacts on the environment and livelihoods of the community. The land use and land cover (LULC) in this area are characterized by a mix of urban development, agricultural land, and natural vegetation, reflecting the diverse agro-ecological conditions present. The socio-economic conditions of the community are varied, with a significant portion of the population residing in informal settlements characterized by inadequate housing, limited access to basic services, and economic marginalization. The settlement pattern in the area is marked by a lack of formal planning and infrastructure, leading to haphazard and unplanned growth of informal settlements. This has resulted in environmental degradation, including deforestation, soil erosion, and pollution of water bodies due to inadequate waste management practices. Moreover, the informal settlements are often located in vulnerable areas such as floodplains or steep slopes, increasing the community's exposure to natural hazards and climate-related risks.

The climate in Adama Town is characterized by seasonal variations, with distinct wet and dry seasons. The impacts of informal settlements on the environment are exacerbated during the rainy season, leading to flooding and associated health risks. Additionally, the reliance of the community on natural resources for livelihood, such as agriculture and informal employment, further strains the environment and contributes to unsustainable land use practices. Understanding the interplay between informal settlements, environmental challenges, and

livelihoods in this context is crucial for developing effective interventions. This requires a multidisciplinary approach that considers urban planning, environmental management, and social development to address the complex dynamics at play in the Boku Shanan Sub-City of Adama Town. Figure 3.1, as shown below presents the spatial description of the research area.

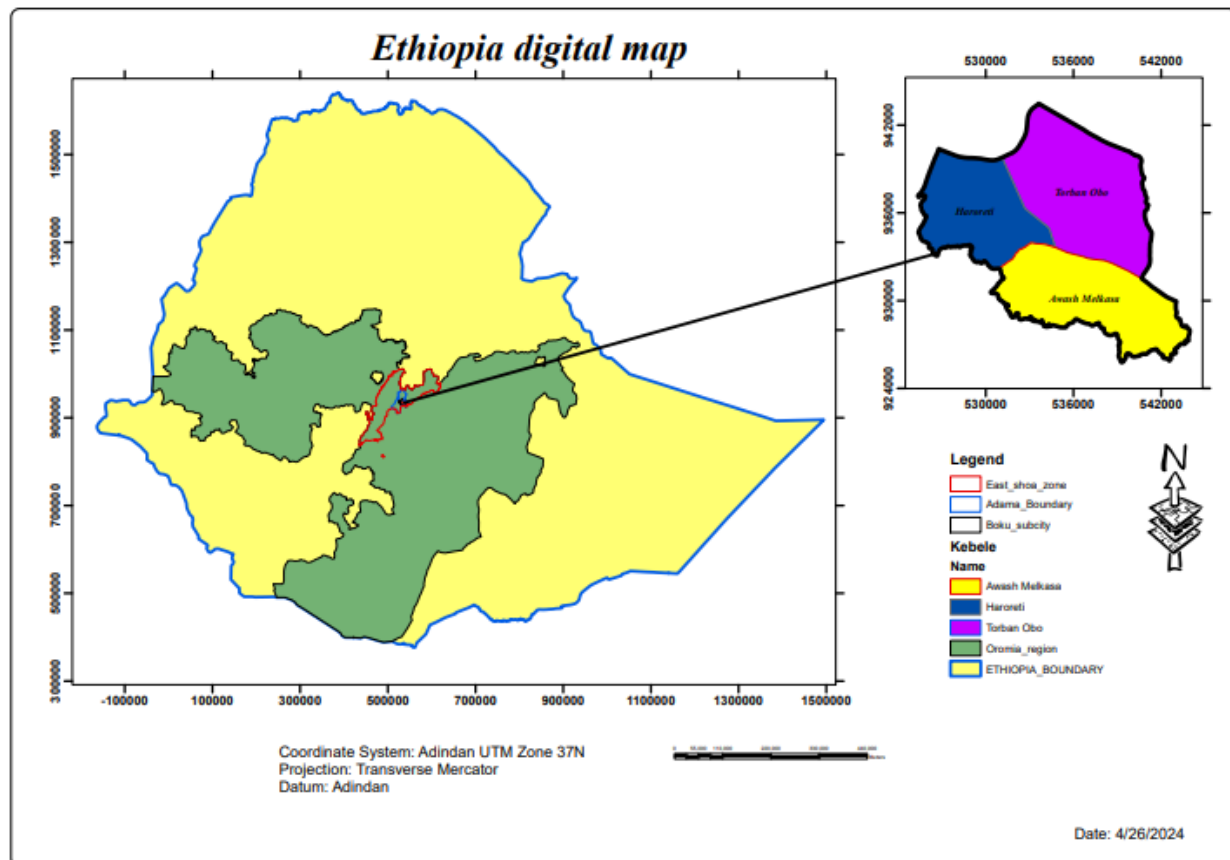


Figure 3. 1: Map of Adama, Boku Shenen sub city

Source: Adama city Municipal

3.3.Research Approach

Research approaches are plans and procedures for conducting research that cover a wide variety of activities, from formulating broad hypotheses to utilizing particular methods for collecting, processing, and interpreting data. The study employed a mixed-methods approach, integrating both quantitative and qualitative data collection techniques, to offer a thorough comprehension of the obstacles and outcomes associated with informal settlements in Adama, Boku Shenen sub city.

Qualitative methods such as interviews and focus group discussions were used to gather in-depth insights into the experiences and perspectives of the factors contributing to the growth, challenges and consequences of informal settlements and their impacts on the environment and livelihood of the community. Quantitative methods such as surveys and data analysis were used to assess the factors contributing to the growth of informal settlements, their challenges and consequences, impacts of informal settlements on the environment and livelihood of the community.

3.4. Research design

Choosing the best methodology, picking the best data gathering techniques, and creating a framework for data analysis are all parts of research design. To collect data from various sources, the research design would make use of a mixed-methods approach, which combines both qualitative and quantitative research techniques. The researcher used an exploratory and descriptive research strategy, depending on the goals of the study. The socioeconomic and environmental effects of informal settlements on the city and its inhabitants, as well as the reasons influencing their rise, were all well-documented using the descriptive research design.

The exploratory research design would be valuable for gaining insights into the key impacts of informal settlements on the existing urban infrastructure and services, and sustainable strategies can be implemented to transform informal settlements into integrated and resilient urban areas.

The mixed-methods research design would offer a comprehensive approach by combining both qualitative and quantitative methods. This would allow researchers to gather detailed information about the factors contributing to the growth of informal settlements, their challenges and consequences, impacts of informal settlements on the environment and livelihood of the community. This design would provide a well-rounded understanding of the situation, making it a strong choice of sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas.

3.5.Data type and source

Primary Data:

Household Surveys: Collect data through structured questionnaires administered to households in Boku sub-city. This can include information on housing conditions, access to services, socioeconomic status, and perceptions of land use.

Key Informant Interviews: Conduct interviews with key informants such as local authorities, community leaders, NGOs, and relevant stakeholders to gain insights into the Challenge, consequence, and interventions related to informal settlements.

Secondary Data:

Government Reports and Records: Gather data from government agencies responsible for urban planning, land administration, and housing. These sources may provide information on land use policies, regulations, and official reports on informal settlements.

Satellite Imagery and Aerial Photographs: Utilize remote sensing data to analyze land cover, land use patterns, and the extent of informal settlements in boku sub-city. This can provide valuable spatial information.

Existing Surveys and Research: Review previous studies, research papers, and reports on informal settlements, land use, or urban development in boku sub-city or similar contexts. These sources can provide background information and comparative insights.

Geographic Information System (GIS) Data:

Digital Maps: Access digital maps that show boundaries, infrastructure networks, land use classifications, and other relevant spatial data for Boku sub-city.

Land Use Plans: Obtain land use plans and zoning regulations for Boku sub-city from local authorities or government agencies responsible for urban planning. These documents can provide insights into intended land uses and regulations.

Other Data Sources:

Community-based Organizations: Collaborate with local community-based organizations or non-governmental organizations (NGOs) that work in Boku sub-city they may have collected data on informal settlements, community dynamics, or interventions related to land use.

Field Observations: Conduct field visits and make observations to supplement your data collection efforts. This can involve documenting the physical characteristics of informal settlements, infrastructure deficiencies, or land use patterns.

When utilized primary and secondary data sources, ensure that the data is reliable, relevant, and up-to-date. Consider the validity and representativeness of your sample when conducting household surveys. Additionally, maintain ethical standards by respecting the privacy and confidentiality of participants and obtaining necessary permissions for data collection.

3.6. Population and Sampling Frame

The population refers to the entire group of individuals or objects that meet a certain set of criteria and are of interest to the researcher. The target populations of the study are informal settlement residents and government officials (professionals) in Adama, Boku shenen sub city. This were include residents and government officials who are directly the factors contributing to the growth of informal settlements, their challenges and consequences, impacts of informal settlements on the environment and livelihood of the community. The study were also involve relevant stakeholders such as local government officials, urban planners, and experts who are involved in decision-making processes related to sustainable strategies can be implemented to transform informal settlements into integrated and resilient urban areas.

A sample frame is a list or representation of the population from which a sample is drawn for the research study. The sampling frame of the study were include a list of informal settlement residents in Adama, Boku shenen sub city, as well as relevant stakeholders such as local government officials, urban planners, and experts who are involved in decision-making processes related to sustainable strategies can be implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku shenen sub city.

3.7.Sampling Technique

By using a technique called sampling, researchers can draw conclusions about a community without having to look into every single person by analyzing data from a portion of the population. For this investigation, a simple random sampling was the most suitable sample method.

Simple random sampling, or a sample chosen by randomization, is a probability sampling strategy in which every member of the population has an equal and independent chance of being included in the sample. It is the process of choosing a sample by choosing a subject that is chosen for a particular reason rather than based on level or region. To perform research and derive inferences about the larger group, a smaller sample size can be chosen by simple random selection from a larger population.

3.8.Sample size determination

The procedure of choosing representative units of a construction party for a study in a research investigation is known as sample size determination. Making sure the sample size is sufficient to yield accurate and dependable study results is crucial. In order to obtain the required quantity of responders, the sample size for the complete sampling frame was determined (representatives). This method will yield more representative and trustworthy data collection.

The sample size of a random sampling techniques for an unknown population size was determined because don't know the exact size of the population study using Cochran's Formula equation 3.1 (Oribhabor & Anyanwu, 2019).

$$n = \frac{z^2 p(1-p)}{e^2} \dots \dots \dots 3.1$$

Where p is the population proportion, e is the precision or error limit, n is the sample size, and z is the confidence interval corresponding to a degree of confidence. Therefore, using the values of e=9% for level precession, p=0.5 (for unknown population size), and Z=1.645 (91% Confidence Interval).

To calculate the sample size of respondents was used above equation 3.1, as shown below:

$$n = \frac{z^2 p(1-p)}{e^2} = \frac{(1.645)^2 (0.5)(1-0.5)}{(0.09)^2} = 84$$

Thus, using basic random sampling, 84 households make up the sample size. The distributing the sample size proportionately for each werda equal sample size in Adama city, Boko Shanan sub-city (Aroretii, Torban obbo and Awash melkasa Werda) is a methodological approach that supports comprehensive, fair, and representative research, enabling a more nuanced understanding of informal settlements and their impacts across the entire city. According to Table 3.1, the determined sample size would be distributed proportionately for each werda that is the outcome.

Table 3. 1: Distribution of sample size

Sampling Frame (Resident)	No of respondents	Sampling Technique
Aroretii Werda	28	Random Sampling technique
Torban obbo	28	Random Sampling technique
Awash melkasa	28	Random Sampling technique
Total	84	

3.9.Data Collection Method

This study was carried out using a variety of data collection techniques. Data, both primary and secondary, has been gathered. The primary data is gathered by the researcher through focus groups, interviews, and questionnaires given to the respondents. In order to obtain information from standard papers, maps, plans, public and unpublished documents, statistical data, and other relevant information gathered from many sources, the researcher gathers secondary data types. The subsequent methods of gathering data have been employed:

3.9.1. Interview

Interviews: Speak with important informants, such as representatives of the local government, business owners, and specialists, in-depth or semi-structured. These interviews can offer insightful information about the causes, difficulties, outcomes, effects, and interventions surrounding Adama's informal settlements. These interviews were also a great source of information about long-term plans to improve Adama's informal settlements. Key informant

interviews with pertinent parties, including representatives of the local administration, urban planners, and experts: Key informant interviews would offer further viewpoints on the difficulties and effects of informal settlements on the local environment and way of life.

For the interview 10 individuals were randomly selected as a key informant: two from local government officials, two from professionals, and six from residents of informal settlements to answer question about issue regarding the challenges and consequences of informal settlements on the environment and livelihood of the community in Adama, Boku Shenen sub city.

Overall, this study use of random sampling for selecting 10 individuals for interviews in informal settlements in Adama, Boku Shenen sub city is based on the practicalities of accessing hard-to-reach populations, building trust and rapport, capturing diverse perspectives, and obtaining rich qualitative data that can inform a deeper understanding of the community's experiences.

3.9.2. Focus group discussions

Focus group discussions were conducted to obtain qualitative information on the experiences, viewpoints, and opinions of community members, residents, and government officials on informal settlements, arrange focus groups. A deeper comprehension of societal dynamics, problems, and potential solutions can be facilitated by these conversations. In order to gather information about the difficulties and effects of informal settlements on the environment and the standard of living of the community, it is commonly utilized as a qualitative strategy to data collection (Lombeso, 2018). Using snowballs, seven key informants three from local government representatives and four from residents of informal settlements were chosen to representatives in a FGD. Focus group discussions were allowing the researchers to explore common experiences and potential sustainable strategies for implemented.

3.9.3. Questionnaires/Surveys

Questionnaires/Surveys: Develop structured questionnaires to collect data from households, local authorities, or community members. The questionnaires can include questions about the factors contributing to the growth, consequences, impact of informal settlements and sustainable strategies for implemented to transform informal settlements. Questionnaires are used to gather quantitative data on specific aspects of the challenges and consequences of informal settlements

on the environment and livelihood of the community, such as factors contributing to the growth, consequences, impact of informal settlements and sustainable strategies for implemented.

The researcher prepared 60 questions that are the first 7 questions about respondents' information; the next 12 questions related to the first objective; the next 19 questions related to the second objective; the next 15 questions related to the third objective; and the last 7 questions related to the fourth objective. There are two sections in the questionnaire. The questionnaire's initial section collects background information of the respondents. The second section of the questionnaire collects data on the factors that have contributed to the growth of informal settlements, the socioeconomic and environmental effects that informal settlements have had on the city and its citizens, the effect that informal settlements have had on the city's current infrastructure and services, and the sustainable strategies that have been put into place to turn informal settlements in Adama, Boku Shenen sub-city, into integrated and resilient urban areas.

3.9.4. Field Observations

Field observations can provide visual evidence and context to complement other data collection methods. Field observation was conducted to observe and document the physical characteristics of informal settlements, land use patterns, infrastructure deficiencies, and other relevant aspects.

3.9.5. Document Analysis

Document Analysis: Review of existing documents, reports and records related to land use policies, urban development plans, zoning regulations, and previous studies conducted in Boku Sub-City. These documents can provide background information and insights into the historical context and existing interventions.

3.9.6. Remote Sensing and GIS

Remote Sensing and GIS were utilized to analyze land cover changes, identify informal settlements, and assess land use patterns. Satellite imagery, aerial photographs, and digital maps can be used to gather spatial data and support the analysis.

3.9.7. Amenities and Services

Boku shenen sub-city has can also classified according to its physical characteristics and suitability for various uses, Freight Terminal proposed Administration Waterbodies Residence, Boku natural stream Commerce and Business Area Green open space Reserved

area Health center Industry and Manufacture Mixed Area proposed Residence R2 Reserved land use.

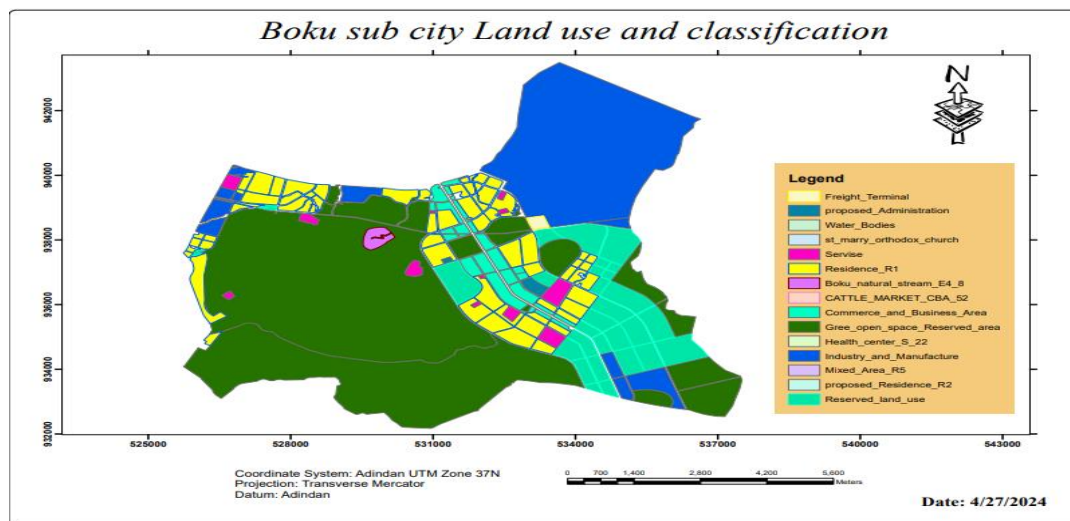


Figure 3. 2: Map of Adama, Boku Shenan sub city Land use and Classification

Source: Adama city Municipal

The researchers in Adama, Boku Shenan sub city, were able to identify potential sustainable strategies for transforming informal settlements and gained comprehensive and nuanced insights into the challenges and consequences of informal settlements on the environment and livelihood of the community by combining a variety of data collection techniques.

3.10. Data analysis Method

These data analysis techniques are best suited for this study to take into consideration based on its particular objectives:

Frequencies, charts, and percentages were used in a descriptive analysis of the data gathered from the respondent's profile, which is the first section of the questionnaire. This data includes the respondent's sex, age, marital status, educational background, occupation, employment status, and monthly income.

Mean score and standard deviation technique

The data collected from the factors contributing to the growth of informal settlements of the questionnaires are analyzed by mean score and standard deviation technique was determined the average significant contribution to the growth of informal settlements in Adama, Boku Shenan

sub-city using the following a 5-point likert scale: Strongly Disagree (SD) = 1, Disagree (D) = 2, moderately Agree (MA) = 3, Agree (A) = 4 and Strongly Agree (SA) = 5.

In order to ascertain the average most significant socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Shenan Boku sub-city, data collected by using questionnaire regarding the socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services was analyzed using the mean score and standard deviation technique that is a statistical technique used to evaluate the average importance of different variables or factors in influencing a dependent variable (Kassem et al., 2020) using five likert scale: Very low effect = 1, Low effect = 2, Moderate effect = 3, High effect = 4 and Very high effect = 5.

Relative Importance Index (RII) Technique

Data collected from the sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas of the survey is further examined using the relative importance index approach, which was employed to ascertain the relative most effective strategies as a result of sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku Shenan sub-city using five likert scale: 1 = Not Effective (NE), 2 = Slightly Effective (SE), 3 = Moderately Effective (ME), 4 = Effective (E) and 5 = Extremely Effective (EE). Equation 3.2, is applied for determining the relative relevance index, as follows (Joro, 2013):

$$RII = \frac{\sum W_i f_{xi}}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{AN} \dots \dots \dots 3.2$$

Where W_i is weight given to i^{th} response; $i = 1, 2, 3, 4$ and 5 , f_{xi} is the responses frequency, N is total number of responses, RII is relative importance indices, A is the highest weight (i.e. 5 in this case), n_5 is number of respondents for value 5, n_4 is number of respondents for value 4, n_3 is number of respondents for value 3, n_2 is number of respondents for value 2 and n_1 is number of respondents for value 1.

The main statistical tools for the classified data were tables, charts, graphs, maps, and images that used the SPSS, Excel, CAD, and GIS software in order to facilitate the interpretation of the data analysis results.

3.11. Validity and Reliability

Concepts like validity and reliability show how well a method, approach, or test assesses an item and are used to assess the caliber of research. A study by Stilwell & Hoskins (2013), found that validity and reliability are the two primary factors used to determine data quality control, with validity assuming reliability.

3.11.1. The study method's validity

Research validity is the extent to which a study accurately measures what it is supposed to measure, and a key component in assessing the validity of the questionnaire results is the ability and willingness of respondents to provide the requested information. The degree to which a study accurately measures what it is intended to measure is known as research validity, and the ability and willingness of respondents to supply the desired information is a critical factor in determining the validity of the questionnaire results. The questionnaire used was modified to fit the current research environment by taking into account similar study instruments and examined literature. In addition, advisers, local professionals, and specialist's pilot tested the modified questionnaires in order to validate them. In general, the researchers want to make sure that their findings can be applied to different populations or environments, adjust for confounding variables, and use proper metrics in order to maximize the validity of their investigations.

The instrument's similarity to other challenges and effects of informal settlements on the environment and community livelihood measurement scales, the advisor's review, the comments from university instructors, and the subsequent steps in the process that follow formal statistical/scientific approach in answering the research questions ensured that the study approach and the measurement instrument fulfill all of the construct, face, and content validity of the research. All of these factors contributed to the study's accurate and clear answer of the research question.

3.11.2. Reliability of Questionnaire

A questionnaire's consistency and stability over time are considered its reliability. When given by multiple researchers or to the same set of participants at different periods, a trustworthy questionnaire consistently yielded consistent results. It is crucial to include standardized questions, unambiguous instructions, and a consistent format while creating a questionnaire in order to guarantee its dependability. Before distributing the questionnaire to a larger sample, it would also be beneficial to do a pilot test on a smaller sample in order to find any problems with the questions or structure. All things considered, acquiring accurate and trustworthy data for research purposes requires the use of a credible questionnaire.

A statistical tool used to evaluate the internal consistency of questionnaire reliability tests is the Cronbach's alpha coefficient. It shows how similar a group of items is to one another and how they would measure the same underlying construct. An elevated Cronbach's alpha coefficient, usually surpassing 0.7, indicates that the survey is dependable and consistent in gauging the targeted construct. It is crucial to remember that construct validity and content validity were taken into consideration, and reliability is only one component of questionnaire validity.

The information obtained from the respondent profile of the questionnaire reliability, which includes test participants' personal characteristics regarding the test environment and their general health, can be used to measure a test's effectiveness. The researcher uses the stratified sampling, simple random sampling, and snowball sampling methods to pick the target population based on the competency and dependability of the informants. This is a legitimate worry, particularly in light of the important informants who provide the majority of the data quality.

Using information acquired from the factors contributing to the growth of informal settlements, the Cronbach's alpha coefficient on a five-point Likert answer scale is used to determine the internal consistency reliability which included Strongly Disagree (SD) = 1, Disagree (D) = 2, moderately Agree (MA) = 3, Agree (A) = 4 and Strongly Agree (SA) = 5, the internal consistency reliability of the data gathered from the questionnaires on the socioeconomic effects and environmental effects of informal settlements on the city, its residents, existing urban infrastructure and services is assessed using the Cronbach's alpha coefficient and is graded on a five-point Likert scale which included Very low impact (VLI) = 1, Low impact (LI) = 2, Medium impact (MI) = 3, High effect (HI) = 4, and Very high impact (VHI) = 5. The Cronbach's

Equation 3.3, the reliability test, is used to calculate Cronbach's alpha, as indicated below (Namdeo & Rout, 2016):

Where; α is the cronbach alpha coefficient, K is the number of items, S_i^2 is the variance of i^{th} item and S_i^2 is the variance of total score formed by summing items.

Using a five-point Likert scale, Cronbach analysis was performed to determine the internal consistency of the questions prior to performing an analysis based on the questionnaire responses. Table 3.2, as shown below, displays the Cronbach Alpha test results, which demonstrate the questionnaire's reliability. The reliability test was conducted on the factors that contribute to the growth of informal settlements, the socio-economic and environmental consequences of informal settlements, the impact of informal settlements, and the sustainable strategies that can be implemented to transform informal settlements in Adama, Boku Shenen sub-city.

Reliability Statistics	Cronbach's Alpha	No of items
The factors contributing to the growth of informal settlements	0.785	12
The socio-economic and environmental consequences of informal settlements	0.870	19
The informal settlements impact	0.774	15
The sustainable strategies for implemented to transform	0.865	7

informal settlements		
Overall	0.868	53

Source: Own survey data analysis

The outcome shows a correlation between the 53 elements in the factors influencing the expansion, the socio-economic and environmental consequences, informal settlements impact and sustainable strategies for implemented to transform informal settlements in Adama, Boku Shenen sub-city. The components are consistent with one another internally. Since the data was gathered using five Likert scales, Cronbach's Alpha was utilized to assess the research's reliability, and every component is at or near 1. Actually, the total Cronbach Alpha score for the 53 elements is 0.868, indicating strong data dependability. The researchers conclude that the exam and its questions were reliable as a consequence.

3.12. Ethical consideration

There were several ethical concerns with this study. It is crucial to take ethical considerations like informed consent, confidentiality, and privacy into account while creating and implementing a questionnaire. The rights of the research participants and the manner in which their data was utilized were explained in detail, along with the goal of the study. Furthermore, there was no penalty for research participants who choose to decline participation or leave the study at any time. Additionally, it's critical to safeguard research participants' privacy and confidentiality by employing anonymous or pseudonymous identifiers and securely storing data. Lastly, the researcher made sure that any possible risks or harm to participants did not exceed the potential benefits of the study.

The study guarantees the confidentiality of the data and does not reveal the identity of any participant. Making sure that participants don't suffer from the research's conclusions is another ethical responsibility. It is forbidden for the author to purposefully misreport results that could harm the participants.

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1. Introduction

The most significant portion of the study is the discussion and outcomes. This topic presents the findings and is organized in accordance with the research purpose. The difficulties and effects of informal settlements on the environment and way of life of the community in Adama, Boku Shenen sub-city, were directly related to the significant finding results. Within the parameters of the study objectives, data gathered via interviews, survey questionnaires, focus groups, field observations, document analysis, remote sensing, and GIS is examined. Using the mean score approach, the analysis was conducted with an emphasis on the socioeconomic and environmental effects of informal settlements, as well as the variables that contribute to their rise. The other analysis was also carried out using RII method; focusing on the impact of informal settlements, and the sustainable strategies for implemented to transform informal settlements. Exploration analysis was used to the potential solutions and sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku Shenen sub-city. As a result, conclusions constituted the foundation for conversations and interpretations that were given. The results are therefore provided concurrently in accordance with the two main subjects indicated below, and this topic seeks to evaluate the findings'.

Respondents in Adama, Boku Shenen sub-city were given a total of 84 questionnaires covering topics such as growth factors, effects of informal settlements, impact of informal settlements, and sustainable strategies for transforming informal settlements into integrated and resilient urban areas. Only 84 questionnaires were gathered, and of those, 100% of the replies were useful. Relevant documents have also been analyzed, along with interviews, focus groups, field observations, remote sensing, GIS, and field observations. Given the challenges associated with gathering data from people of informal settlements, an 100% response rate was deemed to be very good.

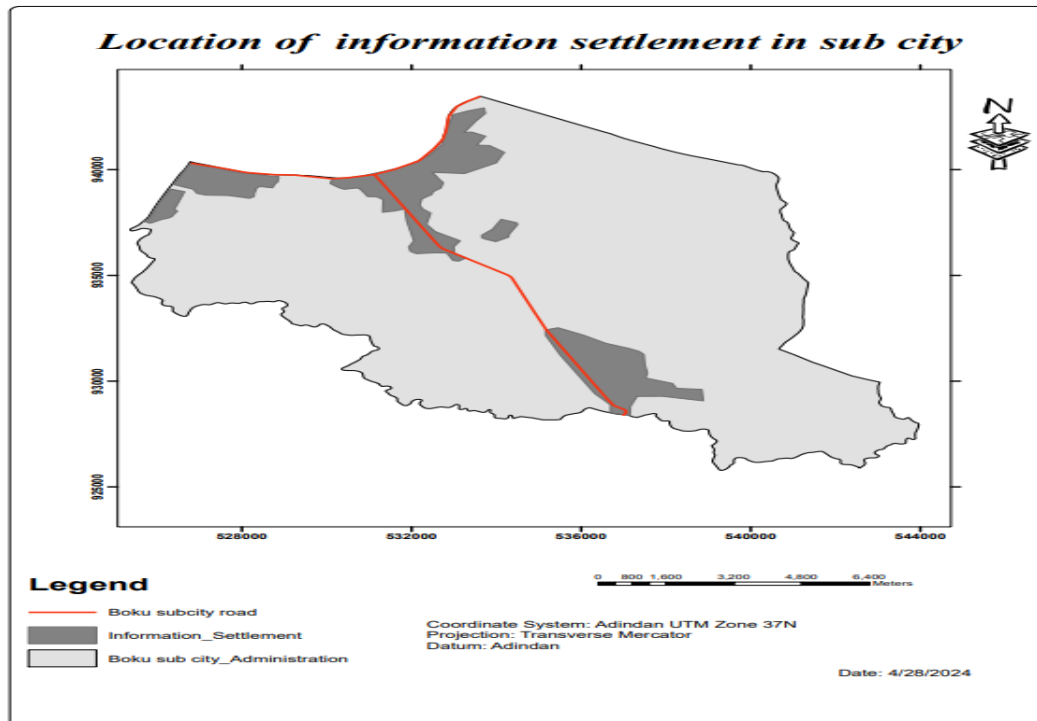


Figure 4. 1: Map of Adama, Boku Shenen sub city informal settlement

Source: Adama city Municipal

4.2. Respondent's Profile

4.2.1. Respondents Gender

The study asked for and collected the respondents' gender information that have been requested during the survey 66.7 percent were male and 33.3 percent were female, which is the result as shown in Table 4.1 below.

Table 4. 1: Gender of the Respondents

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	56	66.7	66.7	66.7
	Female	28	33.3	33.3	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

According to the survey, of the 84 respondents, 56 (66.7%) were men and 28 (33.3%) were women. This suggests that while the majority of respondents were male, both genders

participated in the study to a reasonable extent. This is because, at the time of data collection, the majority of respondents were male.

4.2.2. Respondents Age

Regarding the respondents' ages, 10.7% were between the ages of 18 and 30, 51.2 percent were between the ages of 31 and 45, 25.0 percent were between the ages of 45 and 55, and 13.1% were older than 55. This suggests that the largest proportion of respondents (51.2%) were between the ages of 31 and 45, while the smallest percentage (10.7%) were between the ages of 18 and 30. This indicates that the majority of the households belonged to the active age group and that they were aware of the negative effects that informal settlements have on the local economy and environment. Table 4.2 below provides further details on this.

Table 4. 2: Age of the respondents

	Age (years)	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 30	9	10.7	10.7	10.7
	31 - 45	43	51.2	51.2	61.9
	45 - 55	21	25.0	25.0	86.9
	Above 55	11	13.1	13.1	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

4.2.3. Respondents Educational Background

The study sought to find out the education level of respondents and the responses were analyzed as shown in Table 4.5 below.

Table 4. 3: Respondents Educational Background

	Educational background	Frequency	Percent	Valid %	Cumulative %
Valid	Illiterate	32	38.1	38.1	38.1
	Primary school (1-8 grade)	25	29.8	29.8	67.9
	Secondary school (9-12 grade)	18	21.4	21.4	89.3
	Above grade 12	9	10.7	10.7	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

Regarding the respondents' educational attainment, 32 (38.1%) were illiterate, 25 (29.8%) had finished elementary school, 18 (21.4%) had finished secondary school, and 9 (10.7%) had obtained a certificate and were above grade 12. This suggests that the majority of respondents had a basic level of literacy, which allowed them to comprehend the ways in which informal settlements impacted their various settings.

4.2.4. Respondents Marital status

The results of the survey showed that 43 (51.2%) of the total target respondents were married families, 13 (15.5%) were single families, 14 (16.7%) were divorced families, and 14 (16.7%) were widowed families. Table 4.4 displays the marital statuses of the respondents in the sample, as indicated below.

Table 4. 4: Respondents Marital status

Marital status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	43	51.2	51.2	51.2
	Single	13	15.5	15.5	66.7
	Divorced	14	16.7	16.7	83.3
	Widowed	14	16.7	16.7	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

4.2.5. Respondents Occupation

According to frequency table 4.5, of the total respondents, 24 (28.6%) worked as self-employed people, 45 (53.6%) were employed as public servants, and 15 (17.9%) had other occupations. The occupation-related results that were obtained are displayed in table 4.5 below.

Table 4. 5: Respondents Occupation

Occupation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Self-employed	24	28.6	28.6	28.6
	Public servant	45	53.6	53.6	82.1
	Other	15	17.9	17.9	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

According to the poll results, 28.6% of respondents work for themselves, 53.6% are employed by households (including public and private), and 17.9% of respondents work for themselves, an informal business, or are classified as unemployed. As a result, 17.9% of the area requires that a special emphasis be placed on the job opportunity that is displayed as shown in Figure 4.2.



Figure 4. 2: The informal business (calling it unemployed)

Source: Researcher photo

As shown in Figure 4.2, while informal businesses are not inherently bad, it is essential to understand their complex relationship with urban development and informal settlements. Emphasizing the role of informal businesses in urban economies and considering their impact on settlement growth is crucial for developing holistic strategies to address the challenges faced by both informal businesses and residents of informal settlements.

4.2.6. Respondents Monthly income

The results of the survey showed that 44 (52.4%) of the total target respondents had monthly incomes below 3001 ETB, 20 (23.8%) had monthly incomes between 3001 and 5000 ETB, 13 (15.5%) had monthly incomes between 5001 and 10,000 ETB, and 7 (8.3%) had monthly incomes above 10,000 ETB. Table 4.6 displays the monthly incomes of the respondents' sample, as indicated below.

Table 4. 6: Respondents Monthly income

	Monthly income	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 3001 ETB	44	52.4	52.4	52.4
	3001 -5000 ETB	20	23.8	23.8	76.2
	5001 - 10,000 ETB	13	15.5	15.5	91.7
	Above 10,000 ETB	7	8.3	8.3	100.0
	Total	84	100.0	100.0	

Source: Own survey data analysis

According to table 4.6 above, the majority of households (52.4%) fall into the low-income category. This suggests that the majority of citizens lack the resources to construct their homes and to participate in the public and private development initiatives depicted in Figure 4.3.



Figure 4. 3: Low-Income Group of Peoples Un-able to Re-build their Houses

Source: Researcher photo

4.3. The Factors Contributing to the Growth of Informal Settlements

The goal of this analysis was to determine the degree to which Adama, Boku Shenen sub-city; informal settlement growth is attributed to various contributing factors. A variety of metrics were employed to gauge the expansion of informal settlements. Standard deviations and means were used in the data analysis. The mean score approach was used for the overview evaluation, and respondents were asked to rank the elements that have contributed to the expansion of informal settlements in Adama, Boku Shenen sub-city. Specifically, the mean values are ranked from

highest to lowest, corresponding to 12 common factors that were previously identified through studies and practices. This indicates that the rise of informal settlements in Adama, Boku Shenen sub-city, is attributed to all twelve variables. The value analysis performed on the data mean score is displayed as follows in Table 4.7.

Table 4. 7: Factors contributing to the growth of informal settlements

Factors contributing to the growth of informal settlements	N	Mean	Std. Dev.	Rank
Lack of access to formal land and housing markets	84	3.85	0.988	1
Social and economic disparities within the city	84	3.83	1.074	2
High housing rent at the center	84	3.54	1.035	3
Inadequate urban planning and governance	84	3.49	1.167	4
Insufficient compensation paid to peri-urban farmers during their land expropriation	84	3.45	1.155	5
Land speculation through brokers	84	3.32	1.253	6
Inability to afford the price of land in the formal market	84	3.31	1.086	7
Poverty and economic inequality	84	3.30	1.200	8
Population growth due to natural increase and migration	84	3.26	1.223	9
Cheap land market with the farmer and high cost of formal land to the town	84	3.26	1.262	10
Land substitution modality for previous informal settler after eviction	84	3.25	1.231	11
Lack of affordable housing option	84	3.15	1.207	12

Source: Own survey data analysis

According to the study's conclusions, which are displayed above, Adama, Boku Shenen sub-city's informal settlement growth is mostly caused by the following five major factors: Lack of access to formal land and housing markets with the mean value of 3.85, social and economic disparities within the city with the mean value of 3.83, high housing rent at the center with the mean value of 3.54, inadequate urban planning and governance with the mean value of 3.49 and insufficient compensation paid to peri-urban farmers during their land expropriation with the mean value of 3.45.

Discussion and conclusions on top five most significant factors contributing to the growth of informal settlements in Adama, Boku shenen sub-city:

Lack of access to formal land and housing markets which is the scarcity of affordable and accessible formal land and housing options in Adama, particularly for low-income households has been a major driver of informal settlement growth. The limited availability and high cost of land in formal markets have pushed many residents to seek alternative and often unauthorized housing solutions in informal settlements.

Social and economic disparities which are stark social and economic inequalities have contributed to the proliferation of informal settlements in Adama. Poverty, unemployment, and low wages have made it difficult for many residents to afford formal housing, leading them to resort to informal settlements as a more affordable option.

High housing rent at the center which is the high cost of housing rent in the city center has further fueled the growth of informal settlements. As more people are priced out of the formal housing market, they are forced to seek cheaper accommodation in informal settlements on the outskirts of the city.

Inadequate urban planning and governance which is weak urban planning and governance have exacerbated the growth of informal settlements in Adama. Lack of effective land use planning, zoning regulations, and building codes has allowed for the uncontrolled expansion of informal settlements without adequate infrastructure or services.

Insufficient compensation paid to peri-urban farmers during land expropriation which is inadequate compensation paid to peri-urban farmers during land expropriation has also contributed to the growth of informal settlements. When farmers are not fairly compensated for their land, they may be forced to relocate to informal settlements as they lack the financial means to acquire alternative housing.

According to Edwin (2012), indicated that the problem of the growth of informal settlements in Changamwe Constituency is caused by many factors. The study has also shown that the problems of industrialization of Mombasa County, poverty in the community, unemployment and population growth in Changamwe constituency must be sufficiently addressed if the problem

of the growth of informal settlements in the community is to be addressed. Consequently, the study's findings are consistent with and supportive of (Edwin, 2012)

According to Baye et al. (2023), indicated that the findings on widespread corruption, administrative gaps between rural and urban authorities, lack of clear laws on handling violators of development regulations, and lack of land information systems have fueled the growth of informal settlements. An analysis of the cases presented in this paper reveals that administrative deficiencies interact in complex ways to drive the growth of informal settlements in the areas analyzed. If one looks at the real situation, one would realise that administrative dysfunctions drive the development of informal settlements. Furthermore, it was also concluded that public officials, even though they are responsible for regulating informal settlements within their jurisdictions, failed to do so to the full extent. This is because they have deep ties to land sector corruption. Generally, the assumption that they are responsible for regulating urban land use is ridiculous. Therefore, once again this study finding is also coincides with (Baye et al., 2023)

According to Yassin (2020), indicated that the major factors contributing to the formation and expansions of informal settlements in the study area are Failure of Plan Implementation, lack of financial capacity, rental of unaffordable housing on formal land, absence of accountability and transparency, corruption, and delay in responding to land supply systems as the causes of informal settlement in the study area. The common characteristics of informal housing in the study area are insecurity of tenure, poor housing conditions, lack of infrastructure and basic services, large plot sizes. These have greatly contributed to the unplanned and rapid horizontal expansion of the built-up area of the town, low income group, and hazardous environmental conditions such as flooding. As a result, the findings of this study are consistent and complements with (Yassin, 2020)

Therefore, the conclusions about growth of informal settlements in Adama, Boku Shenen Sub-city can be attributed to a combination of factors, including lack of access to formal land and housing markets, social and economic disparities, high housing rent at the city center, inadequate urban planning and governance, and insufficient compensation paid to peri-urban farmers during land expropriation. Addressing these underlying factors is crucial for developing effective and sustainable strategies to manage and integrate informal settlements into the urban fabric of Adama. This requires a multifaceted approach involving land tenure reforms, affordable housing

initiatives, improved urban planning, inclusive governance, and fair compensation practices for peri-urban farmers.

4.4. The Consequences of Informal Settlements on the City, Its Residents, existing urban infrastructure and services

Each variable's contribution to the overall socioeconomic effects and environmental effects of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Boku Shenen sub-city was examined, and the respondents' perceived criticality of each attribute was used to rank them using a five-point Likert scale (1 = Very low impact, 2 = Low impact, 3 = Medium impact, 4 = High impact and 5 = Very high impact) which was computed most significant consequences and rankings of 19 common socio-economic consequences and environmental consequences of informal settlements as per previous studies and respondents were asked to score which most significant consequences of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Boku Shenen sub-city. An analysis of the mean score and standard deviation values of 34 common factors was conducted in order to rank the most significant impacts of informal settlements. The mean and standard deviation values were interpreted from highest to lowest. This indicates that all thirty four variables are taken into account while analyzing the effects of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Boku Shenen sub-city. The analysis's findings are displayed in Tables 4.8, as can be seen below.

Table 4. 8: Consequences of informal settlements

Consequences of informal settlements on the city, its residents, existing urban infrastructure and services	N	Mean	Std. Dev.	Rank
Irregular residential structure	84	4.01	0.843	1
Access to basic services (water, sanitation, electricity)	84	3.86	1.088	2
Proper sanitation facilities and waste management systems	84	3.86	1.110	3
Security concerns	84	3.85	0.988	4
Informal connections to utilities	84	3.83	1.074	5
Education levels and access to educational facilities	84	3.76	1.248	6
Housing condition and infrastructure	84	3.75	1.096	7

Socio-economic status of residents	84	3.73	1.155	8
Deforestation	84	3.68	1.066	9
Loss of agricultural land	84	3.68	1.355	10
Impact on solid waste management and drainage systems	84	3.67	1.114	11
Health problems (water Born diseases and problems of food storage the facilities)	84	3.67	1.134	12
Access to portable water and energy	84	3.64	1.083	13
Air pollution	84	3.64	1.126	14
Pollution from Solid and Liquid Wastes	84	3.60	1.099	15
Economic opportunities and employment prospects	84	3.58	1.164	16
Weak integration of residents with formal institutions	84	3.54	1.035	17
Challenges for emergency response and disaster management	84	3.54	1.069	18
Problem of sewerage disposal lead to pollution of physical environment	84	3.54	1.145	19
Access to Health facilities	84	3.54	1.164	20
Lack of access to basic services	84	3.49	1.167	21
Pollution of Water Sources	84	3.46	1.265	22
Increased demand for transportation	84	3.45	1.155	23
Degradation of public spaces and recreational areas	84	3.37	1.170	24
Crime rates and public safety concerns	84	3.37	1.185	25
Population density	84	3.36	1.168	26
Social cohesion and community dynamics	84	3.32	1.153	27
Lack of legality of informal settlements prone to crime	84	3.32	1.253	28
Land disputes	84	3.31	1.086	29
Stress on healthcare facilities and services	84	3.30	1.200	30
Social cohesion and community well-being	84	3.26	1.223	31
Informal economy impact	84	3.26	1.262	32
Pressure on water supply, electricity, and sanitation systems	84	3.25	1.231	33
Overcrowding	84	3.15	1.207	34

Source: Own survey data analysis

The following points, in chronological order, represent the socio-economic effects and environmental effects of informal settlements on the city, its residents, existing urban infrastructure and services in Adama specially in Boku Shenen sub-city, based on the mean score standard deviation technique used in Table 4.8 above. The following are the most significant socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Boku Shenen sub-city are irregular residential structure with mean value of 4.01, access to basic services (water, sanitation, electricity) with mean value of 3.86 and standard deviation 1.088, proper sanitation facilities and waste management systems with mean value of 3.86 and standard deviation 1.110, security concerns with mean value of 3.85, informal connections to utilities with mean value of 3.83, education levels and access to educational facilities with mean value of 3.76 and housing condition and infrastructure with mean value of 3.75.

The informal settlements in Boku Shenen sub-city in Adama have significant socio-economic and environmental consequences for the city, its residents, existing urban infrastructure, and services:

The irregular residential structure of informal settlements in Adama's, Boku Shenen sub-city poses significant challenges for urban planning and infrastructure development, making it difficult to efficiently allocate resources and services. Informal settlements often lack proper planning and regulation, leading to irregular and haphazard residential structures. This can pose safety risks and hinder efficient land use.

The lack of access to basic services such as water, sanitation, and electricity in these settlements has a detrimental impact on the quality of life for residents, leading to health issues and overall well-being concerns. Residents of informal settlements may struggle to access basic services such as water, sanitation, and electricity. This can lead to health hazards and a lower quality of life.

The absence of proper sanitation facilities and waste management systems in informal settlements not only contributes to environmental degradation but also increases health risks for residents due to poor hygiene practices. The lack of proper sanitation facilities and waste

management systems in informal settlements can lead to environmental pollution and public health issues.

Security concerns in informal settlements are heightened due to their marginalized status and limited law enforcement presence, making residents vulnerable to crime and violence. Informal settlements are often associated with higher crime rates and security concerns due to the lack of formal law enforcement and surveillance.

Informal connections to utilities strain existing urban infrastructure and services, putting a strain on the sustainability of the city as a whole and potentially leading to service disruptions for all residents. Residents in informal settlements may resort to informal connections to utilities, leading to unsafe and unreliable access to essential services.

Lower education levels in informal settlements perpetuate cycles of poverty and inequality, as residents may not have adequate access to educational facilities or resources to improve their socio-economic status. Informal settlements may have lower education levels due to limited access to educational facilities, which can perpetuate cycles of poverty.

The substandard housing conditions and infrastructure in informal settlements further worsen living conditions for residents, leading to overcrowding, poor ventilation, and inadequate shelter from natural disasters. The housing conditions in informal settlements are often substandard, lacking proper infrastructure and amenities, which can impact the overall well-being of residents.

Accordingly to Bañez-Coronel et al. (2018), indicated that the consequences informal settlement in the town have common problems like problem of legalization of houses, health problems, toilet, electricity and problem of water supply. The consequences of informal settlement, health problems caused by contaminated water. Economic destruction caused by poverty or poor peoples is failures to municipal budget. Therefore, once again this study finding is also coincides with (Bañez-Coronel et al., 2018).

Accordingly to Yassin (2020), indicated that the negative impacts such as social, economic, Environmental and political impacts, informal settlements also have some social benefits especially for low income groups as they are the best alternatives to get land and houses at lower prices. As a result, the rate of informal settlement expansion has been increasing from time to

time and the municipality is missing large amounts of revenue. Since most of the households in the informal settlement sites have low income group they an opinion the government be regularize rather than demolition or forced eviction cannot be the best solution to alleviate the problem as it further exposes the families to awful problems. Therefore, this study also roughly coincide with (Yassin, 2020).

Accordingly to Mohammed (2021), indicated that the squatter area, there is no adequate road that used to vehicle transport. During emergency case, the dwellers in the area used human labor up to the main road. The drainage system is too poor. The dominant energy source is obtained from wood and charcoal. They used electric power only for light purpose. The respondents stated that, they lack access to cover their health cost, because of the expensiveness of medicinal drugs. They are found in health related risks. With regard to education, most of the poor's children are forced to drop out their school education because of lacking of basic educational materials, and other family related problems. As a result, the findings of this study are consistent and complements with (Mohammed, 2021).

In conclusion, the socio-economic and environmental consequences of informal settlements in Adama's Boku Shenen sub-city have far-reaching impacts on the city, its residents, existing urban infrastructure, and services. Addressing these issues requires comprehensive strategies that prioritize access to basic services, improved infrastructure, and sustainable urban planning to enhance the overall quality of life for all residents. Addressing these impacts requires comprehensive strategies that focus on improving security measures, formalizing utility connections, enhancing waste management systems, promoting integration with formal institutions, and strengthening emergency response mechanisms. By addressing these key challenges, policymakers can work towards enhancing the resilience and sustainability of urban infrastructure and services in Adama's informal settlements that is presented as show in Figure 4.4.



Figure 4. 4: Impacts of informal settlements on the urban infrastructure and services

Source: Researcher photo

4.5. Focus Group Discussion

Focus groups are a qualitative method of data collection that this study uses to supplement and close any gaps left by the quantitative section. It has been applied to situations such as adopted strategies and management systems. Its general characteristics include the group's homogeneity; nonetheless, the sequence of the sessions, the gathering of qualitative data, and the focus on a particular issue stand out.

The researcher conducted a focus group with the purpose of gathering information on the informal settlement status in Adama City, Boku Shenan sub-city. The group was guided by eight

key questions that were aimed to facilitate conversation. Representatives from seven carefully chosen key informants comprise the group that was invited; three are local government officials and four are people who live in informal settlements. At the conclusion of the report is an attachment including the attendance list for the seven-person discussion group as well as the researcher's leading questions for the discussion. A synopsis of the conversation is provided beneath the titles of the Boku Shenen sub-city residents below, and pertinent conclusions were extracted from the conversations.

The researcher initiates the discussion by posing questions about the factors that have contributed to the growth of informal settlements in Adama, Boku Shenen sub-city. After much discussion, the most significant factors that have contributed to the growth of informal settlements were found to be a combination of factors like rapid urbanization, lack of affordable housing, limited access to formal employment opportunities, inadequate infrastructure and services, insecure land tenure, and socio-economic disparities have contributed to the growth of informal settlements in Adama's Boku Shenen sub-city. These factors have created a conducive environment for the proliferation of informal settlements, leading to overcrowding, poor living conditions, and limited access to essential services for residents. Addressing these underlying factors is essential for promoting sustainable urban development and improving the well-being of residents in informal settlements.

The focus group discussion on the socio-economic and environmental consequences of informal settlements in Adama's Boku Shenen sub-city shed light on the multifaceted challenges faced by residents living in these settlements. The findings highlighted the detrimental impact of informal settlements on both the city and its residents, including overcrowding, poor living conditions, limited access to essential services, and environmental degradation. It is evident from the discussion that addressing the root causes of informal settlements, such as rapid urbanization, lack of affordable housing, and inadequate infrastructure, is crucial for promoting sustainable urban development and improving the well-being of residents. Sustainable solutions that prioritize inclusive urban planning, access to formal employment opportunities, secure land tenure, and improved infrastructure and services are essential for mitigating the socio-economic and environmental consequences of informal settlements in Adama. Furthermore, engaging with local communities, policymakers, and stakeholders to develop collaborative strategies and

interventions is key to effectively addressing the challenges posed by informal settlements. By working together towards sustainable urban development, we can create a more equitable and resilient city that benefits all residents, including those living in informal settlements in Adama's Boku Shenen sub-city.

The focus group discussion highlighted several significant impacts of informal settlements on the existing urban infrastructure and services in Adama, Boku Shenen sub-city: overburdened infrastructure, increased pressure on services, environmental degradation, increased crime and insecurity, social exclusion and stigma, reduced property values, increased traffic congestion, increased risk of disaster, limited access to formal employment and strain on local government resources. Addressing these impacts requires a comprehensive approach involving upgrading infrastructure and services in informal settlements, improving waste management and environmental protection measures, enhancing security and community policing, promoting social inclusion and community empowerment, and investing in disaster risk reduction strategies. It also necessitates addressing the root causes of informality, such as poverty, lack of affordable housing, and inadequate urban planning and governance.

Overall, the focus group discussions underscored the urgent need for comprehensive interventions to address the impacts of informal settlements on urban infrastructure and services in Adama, Boku Shenen sub-city. Participants emphasized the importance of improving access to basic services, upgrading infrastructure, enhancing disaster preparedness, and promoting sustainable urban planning practices to mitigate the negative effects of informal settlements on the existing urban environment. By addressing these impacts through collaborative efforts involving government agencies, community organizations, and other stakeholders, it is possible to create a more resilient and inclusive urban environment that benefits all residents of Adama, Boku Shenen sub-city.

The focus group discussions on sustainable strategies for transforming informal settlements into integrated and resilient urban areas in Adama, Boku Shenen sub-city yielded several key recommendations. Participants emphasized the importance of adopting a holistic approach that addresses the social, economic, and environmental dimensions of informal settlements to create sustainable urban development solutions. In conclusion, the focus group discussions highlighted the potential for implementing sustainable strategies to transform informal settlements into

integrated and resilient urban areas in Adama, Boku Shenen sub-city. By prioritizing infrastructure upgrades, enhancing access to services, promoting sustainable urban planning, empowering communities, and fostering collaboration among stakeholders, it is possible to create a more inclusive and sustainable urban environment that benefits all residents. Through concerted efforts and collective action, Adama, Boku Shenen sub-city can pave the way for a more resilient and equitable future for its residents. Development unavoidably suffers in nations with high levels of corruption, mismanaged public finances, a lack of transparency, violations of human rights, and disproportionate military power, as Figure 4.5 illustrates.



Figure 4. 5: Demolished Houses

Source: Researcher photo

4.6. The Sustainable Strategies Implemented to Transform Informal Settlements

Each variable's contribution to overall sustainable strategies was evaluated, and respondents' perceptions of each attribute's criticality were used to rank the characteristics were measured using a five-point Likert scale created by the RII (1 = Not Effective, 2 = Slightly Effective, 3 = Moderately Effective, 4 = Effective, and 5 = Extremely Effective). The rankings of seven popular sustainable strategies were also calculated using an equation and prior research, and the results of the analysis are displayed in Tables 4.9, as indicated below.

Table 4. 9: Sustainable strategies implemented to transform informal settlements

Sustainable strategies implemented to transform informal settlements	N	RII	Rank
Community Engagement and Participation	84	0.7833	1
Enhancing access to Social Services and Community Facilities	84	0.7762	2
Creating economic opportunities through skills training, entrepreneurship support, and access to formal employment	84	0.7548	3
Awareness creation to everybody about the informality	84	0.7476	4
Upgrading, Formalization and regularization of land tenure	84	0.7452	5
Affordable Housing Solutions	84	0.7262	6
Inclusive Urban Planning	84	0.6738	7
Valid N (list wise)	84		

Source: Own survey data analysis

Relatively, the following were the sustainable solutions used in Adama, Boku Shenen sub-city, in chronological sequence, to convert informal settlements into integrated and resilient urban regions, based on the RII technique obtained in the above Table 4.9. Thus, top five relatively most significant the sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku Shenen sub-city are Community Engagement and Participation with the RII value of 0.7833, Enhancing access to Social Services and Community Facilities with the RII value of 0.7762, Creating economic opportunities through skills training, entrepreneurship support, and access to formal employment with the RII value of 0.7548, Awareness creation to everybody about the informality with the RII value of 0.7676 and Upgrading, Formalization and regularization of land tenure with the RII value of 0.7452.

Discussion and conclusions on top five relatively most significant sustainable strategies that implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku Shenen sub-city:

Community engagement and participation which is engaging residents of informal settlements in decision-making processes and urban planning initiatives is crucial for transforming these areas into integrated and resilient urban spaces. By involving the community in discussions about infrastructure development, service delivery, and disaster preparedness, local authorities can ensure that the needs and priorities of residents are taken into account, leading to more sustainable and inclusive outcomes.

Enhancing access to social services and community facilities which improving access to essential social services such as healthcare, education, and recreational facilities within informal settlements can help enhance the quality of life for residents and promote social cohesion. By investing in the construction of schools, clinics, community centers, and other public amenities, local authorities can create a more conducive environment for residents to thrive and build strong community ties.

Creating economic opportunities which are empowering residents of informal settlements with skills training, entrepreneurship support, and access to formal employment opportunities can help alleviate poverty, reduce vulnerability, and foster economic resilience within these communities. By promoting small-scale businesses, vocational training programs, and job placement services, local authorities can enable residents to improve their livelihoods and contribute to the local economy.

Awareness creation about informality which is raising awareness among residents, policymakers, and other stakeholders about the challenges and opportunities associated with informality are essential for driving sustainable transformation in informal settlements. By educating the public about the implications of living in informal settlements, the importance of formalization, and the potential benefits of integrated urban planning, local authorities can build support for initiatives aimed at improving living conditions and promoting resilience.

Upgrading, formalization, and regularization of land tenure which is upgrading infrastructure, formalizing land tenure arrangements, and regularizing informal settlements are key strategies

for enhancing the resilience and sustainability of urban areas. By providing secure land rights to residents, improving housing conditions, and upgrading basic infrastructure such as water supply and sanitation systems, local authorities can create a more stable and resilient urban environment that supports long-term development.

In conclusion, implementing sustainable strategies such as community engagement, enhancing access to social services, creating economic opportunities, raising awareness about informality, and upgrading land tenure arrangements can help transform informal settlements in Adama's Boku Shenen sub-city into integrated and resilient urban areas. By addressing the underlying challenges faced by residents in these settlements and promoting inclusive urban development practices, local authorities can work towards building a more sustainable and equitable city for all.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

This study's main goal was to examine and assess the effects of informal settlements on the local community's environment and way of life in Adama, Boku Shanan Sub-City, and to suggest long-term strategies for reducing and transforming these effects. This study's specific goals were to determine what factors led to the growth of informal settlements, evaluate the socioeconomic effects and environmental effects of these settlements on the city and its citizens, city's current infrastructure and services, and evaluate the sustainable strategies that will be used in Adama, Boku Shenen sub-city, to convert informal settlements into resilient and integrated urban areas. In light of this, the conclusion explicitly outlines the key conclusions drawn from the data analysis. As a result, the researcher came to the following conclusion:

The main causes for Adama, Boku Shenen's informal settlement expansion Sub-cities are caused by a number of things, such as poor urban planning and governance, high housing rent in the city center, social and economic inequality, lack of access to official land and housing markets, and inadequate compensation to peri-urban farmers during land expropriation. To effectively manage and integrate informal settlements into Adama's urban fabric, measures that take these fundamental causes into account are essential. This calls for a multimodal strategy that includes equitable pay for peri-urban farmers, land tenure reforms, affordable housing programs, better urban design, and inclusive governance.

The socio-economic and environmental consequences of informal settlements in Adama's Boku Shenen sub-city have far-reaching impacts on the city, its residents, existing urban infrastructure, and services. Addressing these issues requires comprehensive strategies that prioritize access to basic services, improved infrastructure, and sustainable urban planning to enhance the overall quality of life for all residents.

The implementing sustainable strategies such as community engagement, enhancing access to social services, creating economic opportunities, raising awareness about informality, and upgrading land tenure arrangements can help transform informal settlements in Adama's Boku Shenen sub-city into integrated and resilient urban areas. By addressing the underlying

challenges faced by residents in these settlements and promoting inclusive urban development practices, local authorities can work towards building a more sustainable and equitable city for all.

5.2.Recommendation

The following ideas and recommendations might be put into practice in Adama, Boku Shenen sub-city, to transform informal settlements into integrated and resilient urban regions by taking into account the previously mentioned findings and conclusions. Adopted and implemented, these could produce important study results for Adama city experts, policy makers, municipalities, and infrastructure supplying agencies.

The study's conclusions led to the general recommendations listed below:

For Government:

- Government should be implement urban planning and zoning regulations to ensure proper residential structures and land use. Provide support for regularization of informal settlements.
- Government should be investing in infrastructure to ensure equitable access to water, sanitation, and electricity for all residents, including those in informal settlements.
- Government should be develop and implement waste management programs and provide sanitation facilities in informal settlements.
- Government should be increase law enforcement presence and community policing initiatives in informal settlements to address security concerns.
- Government should be providing legal access to utilities and work with service providers to ensure safe and reliable connections for all residents.
- Government should be expanding educational infrastructure and programs in informal settlements to improve access to quality education.
- Government should be investing in infrastructure development and affordable housing options for residents of informal settlements.

For Residents of Informal Settlements:

- Residents should be collaborating with local authorities to develop a framework for regularizing informal settlements and improving housing conditions.

- Residents should be advocate for improved access to basic services through community engagement and involvement in local decision-making processes.
- Residents should be participating in community clean-up initiatives and support waste management efforts within the settlement.
- Residents should be form community watch groups and work with local authorities to improve safety and security within the settlement.
- Residents should be seeking formalized access to utilities through community-led initiatives and engagement with service providers.
- Residents should be advocate for improved educational facilities and support educational initiatives within the settlement.
- Residents should be work with local authorities to improve housing conditions and advocate for better infrastructure within the settlement.

Overall, collaborating between the government, residents, and community organizations is essential to address the socio-economic and environmental consequences of informal settlements in Boku Shenen sub-city. By working together, it is possible to improve living conditions, access to services, and overall well-being for all residents.

REFERENCE

- A. Kassem, M., Azry Khoiry, M., & Hamzah, N. (2020). Using Relative Importance Index Method for Developing Risk Map in Oil and Gas Construction Projects. *Jurnal Kejuruteraan*, 32(3), 441–453. [https://doi.org/10.17576/jkukm-2020-32\(3\)-09](https://doi.org/10.17576/jkukm-2020-32(3)-09)
- Abagissa, J. (2019). Informal Settlements in Addis Ababa: Extent, Challenges, and Measures Taken. *Journal of Public Administration, Finance and Law*, 15, 7–30.
- Agyabeng, A. N., Peprah, A. A., Mensah, J. K., & Mensah, E. A. (2022). Informal settlement and urban development discourse in the Global South: Evidence from Ghana. *Norsk Geografisk Tidsskrift*, 76(4), 242–253. <https://doi.org/10.1080/00291951.2022.2113428>
- Alene, E. T. (2022). Determinant factors for the expansion of informal settlement in Gondar city, Northwest Ethiopia. *Journal of Urban Management*, 11(3), 321–337.
- Ali M. and Sulaiman M. (2006): The Causes and Consequences of the Informal Settlements in Zanzibar. Shaping the Change XXIII FIG Congress Munich, Germany.
- Ali, S. (2006): Managing Slums in Delhi. Sabir Ali ed.: Managing Urban Poverty, Uppal Publishing House, New Delhi.
- Ampofo, J. A., Iddrisu, A., Arfasa, G. F., & Mantey, I. (2024). 1 Judicial Service of Ghana 2 Faculty of Natural Resources and Environment , Department of Environment and Sustainability Sciences , University for Development Studies , Tamale (Ghana) 3 Environmental Protection Agency , Tamale , Northern Region (Ghana. 1(1), 1–18.
- Angel S (2016): Demographic International on Housing Affordability Survey.
- Balasubramanian, A. (2008). Ecosystem and its components. *Earth Science*, 12(7), 1–7.
- Bañez-Coronel, M., Ayhan, F., Tarabochia, A. D., Zu, T., Perez, B. A., Tusi, S. K., Pletnikova, O., Borchelt, D. R., Ross, C. A., Margolis, R. L., Yachnis, A. T., Troncoso, J. C., Ranum, L. P. W., Roos, R. A. C., Perez, M., Jin, W., Le, D., Carlozzi, N., Dayalu, P., ... Frank, S. (2018).

- Baye, F., Adugna, D., & Mulugeta, S. (2023). Administrative failures contributing to the proliferation and growth of informal settlements in Ethiopia: The case of Woldia Township.
- Bose A. (1995): Urbanization and Slums. Prodip to Roy and S. D. Gupta ed.: Urbanization and Slums, Har-An and Publication, New Delhi.
- Brunn S. and Williams J. (1983): Cities of the world: World regional urban development. New York, USA.
- City, K. (2014). Informal settlements: A case study on the informal settlements of Kabul City, Afghanistan. 090.
- Cobigo, V., Martin, L., & Mcheimech, R. (2016). Understanding Community. Canadian Journal of Disability Studies, 5(4), 181.
- Desoto H. (2003): the misty of capital: why capitalism triumphs in the west and fails elsewhere. New York.
- Edwin, R. M. (2012). Factors Influencing Growth Of Informal Settlements: A Case Of Bangladesh Slum, Changamwe Constituency, Mombasa County, Kenya «F*O Z!Y Op < O ^ R By A Research Project Report Submitted In Partial Fullfilment Of The Requirements For The Award Of The Degree.
- Gebrehiwot and Woldemichael (2020): examined the factors contributing to the proliferation of informal settlements in Adama.
- Gebreslassie and Gebremedhin (2018): examined the challenges of urban land management in Adama City.
- Ghasempour, A. (2015). Informal Settlement; Concept, Challenges and Intervention Approaches. Specialty Journal of Architecture and Construction, 1(3), 10–16. www.sciarena.com
- Goshu et al. (2021) examined the social and economic impacts of informal settlements in Adama city.

- Haile G, (2018): Urban land management policy under The Ethiopian federation: the case of Adama city. Addis Ababa, Ethiopia.
- Hardyns, W., & Pauwels, L. J. R. (2017). The Chicago school and criminology. In *The Handbook of the History and Philosophy of Criminology* (Issue February). <https://doi.org/10.1002/9781119011385.ch7>
- Hossain, M. R. (2020). *Introduction to Water, Sanitation and Hygiene (WASH)*. May.
- Joro, A. S. (2013). *Managing And Minimizing Wastage Of Construction Materials On Selected Public Building Projects In Addis Ababa*. June.
- K. Melehy, A. (2023). *How Poverty and income Inequality Affect the Socio-Economic Welfare of the Citizens*. May
- Kadi K. (2003): *The impact of squatter settlement on housing development: The case of Jimma town* (thesis). Addis Ababa, Ethiopia.
- Kamana, A. A., Radoine, H., & Nyasulu, C. (2024). Urban challenges and strategies in African cities – A systematic literature review. *City and Environment Interactions*, 21(December 2023), 100132. <https://doi.org/10.1016/j.cacint.2023.100132>
- Kookana, R. S., Drechsel, P., Jamwal, P., & Vanderzalm, J. (2020). Urbanisation and emerging economies: Issues and potential solutions for water and food security. *Science of the Total Environment*, 732, 139057. <https://doi.org/10.1016/j.scitotenv.2020.139057>
- Kumar, Kuldeep., Devendra, Pratap, S. (2023). Assessing the Dynamics of Urbanization: A Comprehensive Review of Associated Risks and Mitigation Strategies. *Journal of Research in Infrastructure Designing*, 6(3).
- Lamba, A.O. (2005): *Land tenure management systems in informal settlement: the case of Nairobi* (master thesis). ITC, Netherlands.
- Mahtta, R., Fragkias, M., Güneralp, B., Mahendra, A., Reba, M., Wentz, E. A., & Seto, K. C. (2022). Urban land expansion: the role of population and economic growth for 300+ cities. *Npj Urban Sustainability*, 2(1).

- Mamo et al. (2017) investigated the environmental impacts of informal settlements in Adama City.
- Mengistu, N. A., & Belda, R. H. (2024). The role of livelihood diversification strategies in the total household income in Takusa Woreda, Amhara Region, Ethiopia. *Cogent Social Sciences*, 10(1).
- Mersal, A. (2016). Sustainable Urban Futures: Environmental Planning for Sustainable Urban Development. *Procedia Environmental Sciences*, 34, 49–61.
- Mesert (2010): Informal Settlements and its Effect on Socio-Economic development of Burayu town, master's thesis ECSC, Addis Ababa.
- Mezgebo, T. G. (2021). Urbanization and Development: Policy Issues, Trends and Prospects. State of the Ethiopian Economy 2020/2021: Economic Development, Population Dynamics and Welfare. <https://www.researchgate.net/publication/348633575>
- Minwuyelet, M.(2005) City expansion, Squatter Settlements, and Policy Implications in Addis Ababa: The case of Kolfe Keranio Sub City. Working papers on population and land use change in Central Ethiopia, No.2, Acta Geographica, Trondheim.
- Mohammed, K. (2021). Socio-Economic And Environmental Impact Of Informal Settlements : (A Case Study Of Jimma City Selected Sub Cities) Collage Of Business And Economics Socio-Economic and Environmental Impact of Informal Settlements : A Case Study of Jimma City Jimma Unive. June.
- Msimang, Z. (2017). A study of the negative impacts of informal settlement on the environment : a case study of Jika Joe, Pietermaritzburg. University of KwaZulu-Natal, Howard College Campus, 1–114.
- Namdeo, S. K., & Rout, S. D. (2016). Calculating and interpreting Cronbach ' s alpha using Rosenberg assessment scale on paediatrician ' s attitude and p erception on self esteem. 3(6), 1371–1374.
- Nixon, B. (2020). Assessing the environmental impacts of informal settlements in vietnam: The

- case study of the hue citadel unesco world heritage site. *International Journal of Environmental Impacts*, 3(3), 189–206.
- Nouri A.Elfnouk (2015): Squatter Settlements in Tripoli, Libya: Assessing, Monitoring, and Analyzing the Incidence and Prevalence of Urban Squatter Areas In the Peri-Urban Fringe.
- Oribhabor, C. B., & Anyanwu, C. A. (2019). Federal University Dutsin-Ma Journal of Educational Research (Fudjer), 2 (1): 47-56. Federal University Dutsin-Ma Journal of Educational Research (Fudjer), 2(1), 47–56.
- Peter Ngau, P. O. O. M. (2012). Approaches to Informal Settlement Upgrading The Challenge of Sustainable Up-scaling of Informal Settlement Upgrading. Volume 1(July), 12.
- Pomaza-Ponomarenko, A., Leonenko, N., Cherniahivska, V., Lehan, I., & Puzanova, G. (2023). Legal Reform and Change: Research on Legal Reform Processes and their Impact on Society. Analysis of Factors that Facilitate or Hinder Legal Change, Including Political, Social, and Economic Factors. *Journal of Law and Sustainable Development*, 11(10), e1854. <https://doi.org/10.55908/sdgs.v11i10.1854>.
- Rakodi (2014), informal settlements often develop in areas where there is a lack of formal infrastructure provision, such as in peri-urban areas.
- Sameya Yassin Abdulkadir July (2020) Cause and Effects of Informal Housing Development Adama Town, the Case of Boku Shanan Sub-city.
- Samson, K (2010), Urbanization and its impact on the making of informal settlements in Addis Ababa, in Formalization and in formalization process in urban Ethiopia: incorporating informality. 2nd ed. J Fransen,S Kassahun and MP van Dijk, Erasmus University, Shaker,BV.
- Serrat, O. (2017). The Sustainable Livelihoods Approach. *Knowledge Solutions*, November, 21–26. https://doi.org/10.1007/978-981-10-0983-9_5
- Stilwell, C., & Hoskins, R. (2013). Integrated library management systems: A review of choices

made and their sustainability in South Africa. *Information Development*, 29(2), 154–171.
<https://doi.org/10.1177/026666691245406>

Terefe and Gebrehiwot (2021) focused on the impact of improper land use on the urban environment in Adama.

Tilaki, M. J. M., Mustafa, R. A., Marzbali, M. H., Abdullah, A., & Ariffin, J. (2011). Challenges of the informal settlements in developing countries' cities: A case study of Iran. *World Applied Sciences Journal*, 12(2), 160–169.

Tsenkova, S 2009, *Housing Policy Reforms in Post Socialist Europe*, Vienna Declaration on National Regional Policy and Programs 2004 on Informal Settlements, updated 18 May, 2009, Physica-Verlag Heidelberg, Vienna,

UNOPS. (2019). The critical role of infrastructure for the Sustainable Development Goals. The Economist Intelligence Unit Limited 2019, 25. <https://unops.economist.com/wp-content/uploads/2019/01/ThecriticalroleofinfrastructurefortheSustainableDevelopmentGoals.pdf>

UN-Habitat (2003): The challenge of slums: Global report on human settlements. UN Human Settlement Program. Nairobi, Kenya.

UN-HABITAT, (2004): 'Pro-Poor Land Management'. Integrating Slums into City Planning Approaches. Kenya. United Nations.

UNCHS (2002), *Financing Adequate Shelter for all: Addressing the Housing finance*.

UNCHS (2008) *United Nation Human Settlements program regional and technical*.

The UNCHS (2003) estimated that between 40 and 70% of urban growth in developing countries is "informal".

Yassin, S. (2020). Adama; Ethiopia July, 2020 i.

APPENDIX

Appendix A: Survey Questionnaire



Adama Science and Technology University

School of Civil Engineering and Architecture

Department of Architecture (Specialized in Urban Planning and Design)

Questionnaire survey for thesis paper on assesses the challenges and Consequences of informal settlement on the environment and livelihood of the community in Ethiopia, Adama town, Boku Shenen sub-city.

Dear/Sir;

The purpose of this questionnaire is to collect data for the research study entitled “The challenges and Consequences of informal settlement on the environment and livelihood of the community in Ethiopia, Adama town, Boku Shenen sub-city” as a fulfillment of the requirement for the Degree of Master of Science in department of Architecture Specialized by Urban Planning and Design. Your prompt comments and sincere professional opinion will therefore be crucial in determining the outcome of this study. Please be aware that any information disclosed will be kept private and that the data you supply will only be utilized for academic purposes. In order to further develop similar initiatives in the future, we humbly ask that you contribute your share by honestly and responsibly completing the questionnaires. I appreciate your cooperation in advance! The study's conclusions led to the general recommendations listed below:

Please use the following address to get in touch with me if you require any additional clarification:

Kidist Mesfin Gezahgne,

Mobile Number: +2519-38-606505

Email: kidistmesfin2014@gmail.com

General Instruction:

- There is no need to write your name or address.
- For questions that have alternatives, mark your answer by typing "" in the designated space.
- We respectfully ask that you include a brief explanation or supplementary choice in the designated space.

PART ONE: QUESTIONNAIRE FOR RESIDENTS OF THE INFORMAL SETTLEMENTS

Section one: General information about the respondents

1. Sex:
 - a) Male
 - b) female
2. Age (in year):
 - a) 18 - 30
 - b) 31 - 45
 - c) 46 – 55
 - d) Above 55
3. Educational background:
 - a) Illiterate
 - b) primary school (1 -8 grade)
 - c) Secondary school (9 – 12 grade)
 - d) above grade 12
4. Marital status:
 - a) Married
 - b) Single
 - c) Divorced
 - d) Widowed
5. Occupation:
 - a) Self-employed
 - b) Public servant
 - c) Other
6. Employment status:
 - a) Employed
 - b) Unemployed
7. Monthly income:
 - a) Below 3001 ETB
 - b) 3001 – 5000 ETB
 - c) 5001 – 10,000 ETB
 - d) Above 10,000 ETB

Section two: The challenges and Consequences of informal settlement on the community

1. To what extent are you agreeing with the factors contributing to the growth of informal settlements in Adama, Boku Shenen sub-city? Please indicate the most significant contribution level by making on the appropriate box using the following a 5-point likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderately Agree, 4 = Agree and 5 = Strongly Agree.

The factors contributing to the growth of informal settlements	1	2	3	4	5
Inability to afford the price of land in the formal market					
High housing rent at the center					
Lack of affordable housing option					
Land speculation through brokers					
Insufficient compensation paid to peri-urban farmers during their land expropriation					
Land substitution modality for previous informal settler after eviction					
Inadequate urban planning and governance					
Poverty and economic inequality					
Lack of access to formal land and housing markets					
Cheap land market with the farmer and high cost of formal land to the town					
Population growth due to natural increase and migration					
Social and economic disparities within the city					

2. To what extent are you agreeing with the socio-economic consequences and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure and services in Adama, Boku Shenen sub-city? Please indicate the significant consequences by making on the appropriate box using the following a 5-point likert scale: 1 = Very low impact, 2 = Low impact, 3 = Medium impact, 4 = High impact and 5 = Very high impact.

The socio-economic and environmental consequences of informal settlements on the city, its residents, existing urban infrastructure	1	2	3	4	5

and services					
Health problems (water Born diseases and problems of food storage the facilities)					
Crime rates and public safety concerns					
Problem of sewerage disposal lead to pollution of physical environment					
Irregular residential structure					
Loss of agricultural land					
Air pollution					
Pollution of Water Sources					
Deforestation					
Pollution from Solid and Liquid Wastes					
Population density					
Housing condition and infrastructure					
Access to basic services (water, sanitation, electricity)					
Economic opportunities and employment prospects					
Education levels and access to educational facilities					
Access to Health facilities					
Social cohesion and community dynamics					
Socio-economic status of residents					
Proper sanitation facilities and waste management systems					
Access to portable water and energy					
Land disputes					
Weak integration of residents with formal institutions					
Overcrowding					
Lack of legality of informal settlements prone to crime					
Increased demand for transportation					
Pressure on water supply, electricity, and sanitation systems					
Lack of access to basic services					
Stress on healthcare facilities and services					
Security concerns					
Social cohesion and community well-being					

Informal economy impact					
Informal connections to utilities					
Impact on solid waste management and drainage systems					
Degradation of public spaces and recreational areas					
Challenges for emergency response and disaster management					

3. To what extent are you agreeing with the sustainable strategies for implemented to transform informal settlements into integrated and resilient urban areas in Adama, Boku Shenen sub-city? Please indicate the most effective strategies by making on the appropriate box using the following a 5-point likert scale: 1 = Not Effective (NE), 2 = Slightly Effective (SE), 3 = Moderately Effective (ME), 4 = Effective (E) and 5 = Extremely Effective (EE).

The sustainable strategies for implemented to transform informal settlements into integrated and resilient urban area	1	2	3	4	5
Awareness creation to everybody about the informality					
Community Engagement and Participation					
Affordable Housing Solutions					
Inclusive Urban Planning					
Enhancing access to Social Services and Community Facilities					
Upgrading, Formalization and regularization of land tenure					
Creating economic opportunities through skills training, entrepreneurship support, and access to formal employment					

Appendix B: Focus Group Discussion Question

1. What do you think are the main factors contributing to the growth of informal settlements in Adama city?
2. What are the main reasons why people choose to live in informal settlements in Adama?
3. What are the most significant socio-economic consequences of informal settlements on the city and its residents?
4. What are the positive and negative impacts of informal settlements on the city and its residents?
5. How do informal settlements strain the existing urban infrastructure and services, such as water supply, electricity, transportation, and healthcare?
4. What are the challenges and opportunities for integrating
5. Informal settlements into the formal urban planning and service provision systems?
6. What sustainable strategies do you believe could be effective in transforming informal settlements into integrated and resilient urban areas in Adama?
7. What are the best practices and innovative approaches that can be implemented to transform informal settlements into integrated and resilient urban areas?

Appendix C: Interview Question

1. What are your observations on the key factors that have contributed to the growth of informal settlements in Adama city?
2. How you plan to identify the factors contributing to the growth of informal settlements in Adama city?
3. Could you share your insights on the socio-economic and environmental consequences that informal settlements have on the city and its residents?
4. How do you intend to assess the socio-economic and environmental consequences of informal settlements on the city and its residents?
5. How do you assess the impact of informal settlements on the existing urban infrastructure and services in Adama?
6. What specific methods will you use to examine the impact of informal settlements on the existing urban infrastructure and services in Adama?
7. What are your recommendations for sustainable strategies that can be implemented to transform informal settlements into integrated and resilient urban areas?
8. Could you provide examples of sustainable strategies that you believe can be effective in transforming informal settlements into integrated and resilient urban areas in Adama?

Appendix D: Gaaffii Qorannoo



Yuunivarsiitii Saayinsii fi Teeknooloojii Adaamaa

Mana Barumsaa Siivil Injinariingii fi Arkiteekcharii

Kutaa Arkiteekcharii (Ogeessa Pilaanii fi Dizaayinii Magaalaa) .

Qorannoon gaaffilee waraqaa qorannoo barruu qorannoo (thesis paper) irratti qormaata fi Bu'aa qubsumni al-seerummaa naannoo fi jireenya hawaasaa irratti qabu madaala Itoophiyaa magaalaa Adaamaa, magaalaa guddittii Boku Shenen.

Jaallatamoo Obbo/Addee;

Kaayyoon gaaffilee kanaa qorannoo qorannoo mata duree “qormaata fi Bu'aa qubsumni al-seerummaa naannoo fi jireenya hawaasaa Itoophiyaa, magaalaa Adaamaa, magaalaa guddittii Boku Shenen irratti qabu madaala” jedhuuf ragaa walitti qabuu akka guuttachuuf ulaagaan Digirii Lammaffaa Saayinsii kutaa Arkiteekcharii Pilaanii fi Dizaayinii Magaalaatiin adda ta'e. Kanaafuu, milkaa'ina qorannoo kanaa murteessuuf yaadni dhugaa, ogummaa fi deebii yeroon kennitu murteessaadha. Odeeffannoon isin kennitan kaayyoo barnootaa qofaaf kan oolu ta'uu fi odeeffannoon ifa ta'e hundi iccitii akka ta'u hubadhaa. Kanaafis, gara fuulduraatti hojiiwwan walfakkaatan fooyyessuuf yaada dabalataa kennuudhaaf gaaffilee amanamummaa fi itti gaafatamummaadhaan guutuudhaan qooda mataa keessanii akka gumaachitan kabajaan isin gaafanna. Tumsa keessaniif dursinee galatoomaa!!!

Ibsa dabalataa yoo barbaaddan karaa teessoo armaan gadii kanaan na qunnamuu dandeessu:

Kidist Mesfin Gezahgne,

Lakkoofsa Mobaayilaa: +2519-38-606505

Imeelii: kidistmesfin2014@gmail.com irratti ergaa

Qajeelfama Waliigalaa:

- Maqaa/teessoo kee barreessuu hin barbaachisu.
- Gaaffiiwwan filannoo qaban sanaaf deebii kee bakka kenname irratti “ ✓ ” jechuun mallatteessi.
- Filannoo ykn ibsa dabalataa kamiifuu bakka kenname irratti gabaabinaan akka barreessitan kabajaan isin gaafanna.

Kutaa tokkoffaa: Odeeffannoo waliigalaa waa’ee deebii kennitootaa

1. Walqunnamtii saalaa:

- a) Dhiira b) dubartii

2. Umurii (waggaadhaan):

- a) 18 - 30 b) 31 - 45 c) 46 – 55 d) 55 ol

3. Seenaa barnootaa:

- a) Dubbisuu fi barreessuu kan hin dandeenye b) mana barumsaa sadarkaa tokkoffaa (kutaa 1 -8).
c) Mana barumsaa sadarkaa lammaffaa (kutaa 9 – 12) d) kutaa 12 ol

4. Haala gaa’elaa:

- a) Kan heerumte b) Kan hin fuudhin c) Kan wal hiikan d) Kan abbaan manaa irraa du’e

5. Hojii:

- a) Ofiin hojjechiisaa b) Hojjetaa mootummaa c) Kan biroo

6. Haala qaxarrii:

- a) Qaxara b) Hojii dhabe

7. Galii ji’aa:

- a) ETB 3001 gadi c) ETB 5001 – 10,000 gadi ta’a
b) 3001 – 5000 ETB d) 10,000 ETB ol ta’a

Kutaa lama: Qormaata fi Bu'aa qubsumni al-seerummaa hawaasa irratti fidu

1. Magaala xiqqaa Boku Shenen Adaamaa keessatti qubsuma al-seerummaa guddisuuf wantoota gumaachan irratti hangam walii galtee jirta? Maaloo sadarkaa gumaacha guddaa ta'e sanduuqa barbaachisaa ta'e irratti iskeelii likert qabxii 5 armaan gadii fayyadamuun agarsiisuu: 1 = Cimsee walii hin galu, 2 = Walii hin galu, 3 = Giddugaleessatti walii galuu, 4 = Walii galuu fi 5 = Cimsee walii gala.

Qabxiilee guddina qubsuma al-seerummaaf gumaachan	1	2	3	4	5
Gabaa lafaa gabaa idilee keessatti kaffaluu dadhabuu					
Giddugalicha keessatti kiraa mana jireenyaa olaanaa					
Filannoo mana jireenyaa gatii madaalawaa ta'e dhabuu					
Tilmaama lafaa karaa daldaltootaa					
Qonnaan bultoota naannoo magaalaa jiraniif yeroo lafa isaanii saamamu beenyaan gahaan kaffalamuu dhabuu					
Haala bakka bu'iinsa lafaa qubsiistota al-seerummaa duraanii erga buqqifamee booda					
Karoora fi bulchiinsa magaalaa gahaa ta'uu dhabuu					
Hiyyummaa fi walqixxummaa dinagdee					
Gabaa lafaa fi mana jireenyaa idilee argachuu dhabuu					
Gabaa lafaa gatii salphaa qonnaan bulaa waliin fi baasii guddaa lafa sirnaa magaalattiitti					
Guddina baay'ina ummataa sababa baay'ina uumamaa fi godaansa irraa kan ka'e					
Garaagarummaa hawaasummaa fi dinagdee magaalattii keessatti mul'atu					

2. Maaloo iskeelii likert qabxii 5 kan armaan gadii fayyadamuun saanduqa barbaachisaa ta'e irratti gochuun bu'aa guddaa agarsiisi: 1 = Cimsee walii hin galu, 2 = Walii hin galu, 3 = Giddugaleessaan walii hin galu, 4 = Walii galuu fi 5 = Cimsee walii gala.

Bu'aa hawaas-dinagdee fi naannoo qubsumni al-seerummaa magaalattii fi jiraattota ishee irratti fidu	1	2	3	4	5
Rakkoo fayyaa (Dhukkuba bishaan irraa dhalatee fi rakkoo kuusaa nyaataa dhaabbilee) .					
Sadarkaa yakkaa fi yaaddoo nageenya hawaasaa					
Rakkoon kuufama bishaan boollaa faalama naannoo fiizikaalaa fida					
Caasaa mana jireenyaa sirrii hin taane					
Lafa qonnaa dhabuu					
Faalama qilleensaa					
Faalama Maddoota Bishaanii					
Bosona ciruu					
Faalama Balfa Jajjaboo fi Dhangala'aa irraa dhufu					
Dandeettii baay'ina ummataa					
Haala mana jireenyaa fi bu'uuraalee misoomaa					
Tajaajila bu'uura (bishaan, qulqullina, ibsaa) argachuu .					
Carraa dinagdee fi carraa hojii					
Sadarkaa barnootaa fi qaqqabummaa meeshaalee barnootaa					
Dhaabbilee Fayyaa argachuu					
Walitti hidhamiinsa hawaasummaa fi daayinamiksii hawaasaa					
Haala hawaas-dinagdee jiraattotaa					
Dhaabbilee qulqullinaa fi sirna bulchiinsa balfaa sirrii ta'e					
Bishaan fi anniisaa socho'aa argachuu					

3. Dhiibbaa qubsumni al-seerummaa armaan gadii bu'uuraalee magaalaa fi tajaajila magaalaa Adaamaa, magaalaa xiqqaa Boku Shenen jiran irratti hangam dhiibbaa geessisaa? Maaloo iskeelii likert qabxii 5 kan armaan gadii fayyadamuun saanduqa barbaachisaa ta'e irratti gochuudhaan dhiibbaa dhiibbaa agarsiisi: 1 = Dhiibbaa baay'ee gadi aanaa, 2 = Dhiibbaa xiqqaa, 3 = Dhiibbaa giddu galeessaa, 4 = Dhiibbaa olaanaa fi 5 = Dhiibbaa baay'ee ol'aanaa.

Dhiibbaa qubsumni al-seerummaa bu’uuraalee misoomaa fi tajaajiloota magaala jiran irratti qabu	1	2	3	4	5
Falmii lafaa					
Walitti makamuun jiraattotaa dhaabbilee idilee waliin laafaa ta’uu					
Garmalee walitti qabamuu					
Qubsuma al-seerummaa yakkaaf saaxilamu seera qabeessummaa dhabuu					
Fedhiin geejjibaa dabaluu					
Dhiibbaa dhiyeessii bishaanii, ibsaa, fi sirna qulqullinaa irratti					
Tajaajila bu’uura argachuu dhabuu					
Dhaabbilee fi tajaajiloota eegumsa fayyaa irratti dhiibbaa uumuu					
Yaaddoo nageenyaa					
Walitti hidhamiinsa hawaasummaa fi nageenya hawaasaa					
Dhiibbaa dinagdee al-seerummaa					
Walitti hidhamiinsa al-seerummaa dhaabbilee fayyadamaa wajjin taasifamuu					
Dhiibbaa bulchiinsa balfa jajjaboo fi sirna bishaan ba’uu irratti qabu					
Iddoowwan uummataa fi bakka bashannanaa manca’uu					
Qormaata deebii hatattamaa fi bulchiinsa balaa					

4. Qubsuma al-seerummaa gara magaala walitti hidhame fi dandamachuu danda’utti jijjiiruuf tooftaalee itti fufiinsa qaban hojiirra oolchuuf hangam irratti walii galtee jirtu, magaala xiqqaa Boku Shenen Adama keessatti? Maaloo tooftaalee bu’a qabeessa ta’an saanduqa barbaachisaa ta’e irratti iskeelii likert qabxii 5 armaan gadii fayyadamuun agarsiisuu: 1 = Bu’a qabeessa miti (NE), 2 = Xiqqoo Bu’a qabeessa (SE), 3 = Bu’a qabeessa Giddugaleessaa (ME), 4 = Bu’a qabeessa (E) fi 5 = Garmalee Bu’a qabeessa (EE).

Qubsuma al-seerummaa gara naannoo magaalaa walitti hidhame fi dandamatutti jijjiiruuf tooftaalee itti fufiinsa qaban hojiirra oolchuuf	1	2	3	4	5
Waa'ee al-seerummaa nama hundaaf hubannoo uumuu					
Hirmaannaa fi Hirmaannaa Hawaasaa					
Furmaata Mana Jireenyaa Gatiin Isaa Gahaa					
Karoora Magaalaa hunda hammate					
Tajaajila Hawaasummaa fi Faayidaa Hawaasaa argachuu guddisuu					
Qabiyyee lafaa fooyyessuu, Foormaalii gochuu fi sirna qabeessa taasisuu					
Leenjii ogummaa, deeggarsa abbootii qabeenyaa, fi hojii idilee argachuudhaan carraa dinagdee uumuu					