

**INTEGRATING RESIDENTIAL HOUSING SATISFACTION ATTRIBUTES  
INTO NEIGHBOURHOOD PLANNING IN ELDORET MUNICIPALITY,  
KENYA**

**BY**

**ALIMA TOVESI DENNIS**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN  
ENVIRONMENTAL PLANNING AND MANAGEMENT IN THE  
DEPARTMENT OF ENVIRONMENTAL MONITORING PLANNING AND  
MANAGEMENT, SCHOOL OF ENVIRONMENTAL STUDIES  
UNIVERSITY OF ELDORET, KENYA**

**MAY, 2021**

**DECLARATION****DECLARATION BY THE STUDENT**

This thesis is my original work and has not been submitted for any academic award in any institution; and shall not be reproduced in part or full, or in any format without prior written permission from the author and/or University of Eldoret, Kenya

\_\_\_\_\_ Date\_\_\_\_\_

**ALIMA TOVESI DENNIS**

**SENV/EPM/M/004/18**

**DECLARATION BY THE SUPERVISORS**

This research thesis has been submitted with our approval as University Supervisors.

\_\_\_\_\_ Date\_\_\_\_\_

**DR. ANDREW KIPLAGAT**

**DEPARTMENT OF ENVIRONMENTAL MONITORING, PLANNING AND  
MANAGEMENT**

**UNIVERSITY OF ELDORET, KENYA**

\_\_\_\_\_ Date\_\_\_\_\_

**DR. BENJAMIN MWASI**

**DEPARTMENT OF ENVIRONMENTAL MONITORING, PLANNING AND  
MANAGEMENT**

**UNIVERSITY OF ELDORET, KENYA**

## **DEDICATION**

I dedicate this thesis to my parents Mr. Francis Alima Injendi and Mrs. Grace Alima Mukoya, my fiancée Mercyline Chepkemoi, my daughter Darlene Mukoya and the entire Alima family and friends.

## ABSTRACT

Sustainable provision of good quality residential housing in urban environments has remained to be one of the major challenges facing urban planning today. Scarcity of land, lack of coordination between key stakeholders, tedious housing planning approval processes, lack of societal equity and fairness in metropolitan housing, rural-urban migration leading to rapid urban growth among other drivers, have made it almost impossible for planners to create a balance between the three pillars of sustainability that is social, economic and environment. Satisfaction studies have been one of the dominant areas of research in social psychology with areas of research including consumer satisfaction and job satisfaction dominating the discipline. These researches were based on the conception that understanding peoples' satisfactory evaluation of a product or service will serve to bring forth improvements to the product or service. Residential studies were first introduced in the western countries during the sub-urban development and housing boom period of the 1950s and early 1960s. The studies were meant to guide the upcoming housing improvement, living forms and principal urban reconstruction through shanty town redevelopment programmes. This study sought asses levels of residential satisfaction, determine the relationship between selected housing attributes, household socio-economic characteristics and residential satisfaction and to determine the extent of compliance to selected residential planning standards. The study was conducted in Elgon View, Kimumu and Munyaka neighbourhoods of Eldoret Municipality. The data was collected using survey, mapping, measurement and observation techniques. The data was analysed using SPSS version 26 and ArcGis 10.5. Descriptive statistics and ordinal logistic regression were used to analyse data in line with the objectives. Eldoret Municipality was found to have a moderate level of residential satisfaction. Neighbourhood hygiene, public security, number of rooms in a dwelling unit, environmental aesthetics, age, marital status, employment, income and house tenure were found to be significant determinants of residential satisfaction. There was 100% compliance to plot size and number of dwelling units per lot planning standard. On access road width, plot coverage and skyline, there was 11.8%, 57.72% and 89.84% compliance respectively. Building line compliance that is front, side and rear had 81.3%, 66.3% and 36.2% compliance respectively. It was concluded that planners should develop plans in a way to lower housing density in neighbourhoods, enhance neighbourhood hygiene, enhance public security and to enhance environmental aesthetics so as to improve residential satisfaction.

## TABLE OF CONTENTS

<b>DECLARATION .....</b>	<b>i</b>
<b>DEDICATION .....</b>	<b>ii</b>
<b>ABSTRACT .....</b>	<b>iii</b>
<b>TABLE OF CONTENTS .....</b>	<b>iv</b>
<b>LIST OF TABLES.....</b>	<b>viii</b>
<b>LIST OF FIGURES.....</b>	<b>x</b>
<b>LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS .....</b>	<b>xii</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>xiii</b>
<b>CHAPTER ONE.....</b>	<b>1</b>
<b>INTRODUCTION .....</b>	<b>1</b>
1.1 Background to the Study.....	1
1.2 Problem Statement.....	4
1.3 Objectives .....	5
1.3.1 Main Objective .....	5
1.3.2 Specific Objective .....	5
1.4 Hypothesis .....	5
1.5 Justification and Significance of the Study.....	6
1.6 Structure of Thesis Report .....	6
<b>CHAPTER TWO.....</b>	<b>8</b>
<b>LITERATURE REVIEW .....</b>	<b>8</b>
2.1 Overview.....	8
2.2 Housing Planning Challenges.....	8
2.3 The Role of Residential Satisfaction Studies.....	10
2.4 Understanding the concept of Residential Satisfaction .....	11
2.5 The Origin of Residential Satisfaction.....	13
2.6 Theories Related to Residential Satisfaction .....	13
2.7 Reflection on Residential Satisfaction Theories .....	16

2.8	Empirical Studies on Residential Satisfaction .....	16
2.9	Implications of Residential Satisfaction on Urban Planning .....	20
2.10	The Nexus Between Urban Housing Planning Standards and Housing Satisfaction .....	22
2.10.1	Housing Development Plans .....	23
2.10.2	Planning Control in Housing Development .....	24
2.11	Policy, Legal Context and Institutional Framework of Residential Housing Planning in Kenya .....	24
2.12	Integrating New Planning Concepts into the Existent Land Use Planning Principles .....	25
2.12.1	Smart Cities .....	26
2.12.2	New Urbanism.....	27
2.13	Conceptual Framework.....	28
<b>CHAPTER THREE.....</b>		<b>30</b>
<b>MATERIALS AND METHODS.....</b>		<b>30</b>
3.1	Introduction.....	30
3.2	Study Area Description.....	30
3.2.1	Physiography .....	30
3.2.2	Climatic Condition .....	30
3.2.3	Geology, Soils and Ecology .....	31
3.2.4	Infrastructures and Transport .....	31
3.3	Nature, Types and Sources of Data .....	33
3.4	Research Design .....	34
3.5	Target Population.....	35
3.6	Sampling Design.....	35
3.6.1	Stratified Sampling.....	35
3.6.2	Purposive Sampling.....	35
3.6.3	Simple Random Sampling.....	36

3.7	Sample Size Determination .....	36
3.7.1	Respondent Sampling procedure .....	37
3.8	Data Collection Techniques and Tools .....	38
3.8.1	Survey Technique .....	38
3.8.2	Mapping Methods .....	42
3.8.3	Measurement Techniques .....	43
3.9	Data Management and Analysis .....	43
3.9.1	Objective One: To assess level of residential satisfaction across neighbourhoods .....	43
3.9.2	Objective Two and Three: To determine the relationship between selected housing attributes, selected socioeconomic characteristics and residential satisfaction .....	44
3.9.3	Objective Four: To determine the extent of compliance to selected residential planning standards .....	47
<b>CHAPTER FOUR .....</b>		<b>48</b>
<b>RESULTS .....</b>		<b>48</b>
4.1	Overview .....	48
4.2	Levels of Residential Satisfaction .....	48
4.3	Satisfaction with Housing Attributes .....	50
4.4	Relationship between selected housing attributes and residential satisfaction .....	65
4.4.1	Dwelling Unit Attributes .....	65
4.4.2	Neighbourhood Attributes .....	70
4.4.3	Ordinal Logistic Regression on Housing Attributes and Residential Satisfaction .....	73
4.5	Relationship between household socio-economic characteristics and residential satisfaction .....	76
4.5.1	Socio-economic Characteristics of Respondents .....	76

4.5.2 Ordinal Logistic Regression on Socio-Economic Attributes and Residential Satisfaction .....	82
4.6 Extent of compliance to residential planning standards .....	86
<b>CHAPTER FIVE .....</b>	<b>100</b>
<b>DISCUSSIONS .....</b>	<b>100</b>
5.1 Overview.....	100
5.2 Residential Satisfaction in Eldoret Municipality.....	100
5.3 Relationship between selected housing attributes and residential satisfaction.....	104
5.4 The relationship between selected household socio-economic characteristics and residential satisfaction .....	107
5.5 Compliance to selected residential planning standards .....	109
<b>CHAPTER SIX.....</b>	<b>112</b>
<b>SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION ..</b>	<b>112</b>
6.1 Introduction.....	112
6.2 Summary of findings .....	112
6.3 Conclusions.....	113
6.4 Recommendations.....	113
<b>REFERENCES .....</b>	<b>117</b>
<b>APPENDICES.....</b>	<b>129</b>
<b>APPENDIX I: QUESTIONNAIRE.....</b>	<b>129</b>
<b>APPENDIX II: LIST OF NEIGHBOURHOODS IN STUDY AREA.....</b>	<b>134</b>
<b>APPENDIX III: OBSERVATION CHECKLIST .....</b>	<b>135</b>
<b>APPENDIX IV: RESEARCH PERMIT .....</b>	<b>136</b>
<b>APPENDIX V: SIMILARITY REPORT .....</b>	<b>138</b>



## LIST OF TABLES

Table 3.1 Data Sought by Survey Technique .....	41
Table 3.2 Data Sought by Mapping Technique .....	43
Table 3.3 Data Sought by Measurement Technique .....	43
Table 3.4 Matrix of Compliance .....	47
Table 4.1 Overall Residential Satisfaction Level in the Study Area .....	48
Table 4.2 Satisfaction with Number of Rooms .....	50
Table 4.3 Satisfaction with Neighbourhood Hygiene .....	51
Table 4.4 Satisfaction with General Cleanliness and Environmental Aesthetics.....	53
Table 4.5 Satisfaction with Rent and Mortgage Expenses .....	54
Table 4.6 Satisfaction with Housing Ventilation .....	55
Table 4.7 Satisfaction Natural Lighting in the House .....	56
Table 4.8 Satisfaction with Transportation Cost .....	58
Table 4.9 Satisfaction with Public Facilities .....	59
Table 4.10 Satisfaction with Public Security .....	60
Table 4.11 Dwelling unit Features Summary.....	65
Table 4.12 Summary of Mean Distances to Various Neighbourhood Facilities.....	73
Table 4.13 Final Ordinal Logistic Regression Model with Predictors of Residential Satisfaction .....	74
Table 4.14 Model Fitting Information.....	75
Table 4.15 Goodness of Fit .....	75
Table 4.16 Pseudo R-Square .....	75
Table 4.17 Test of Parallel Lines.....	76
Table 4.18 Socio Economic Characteristics of Households in Eldoret Municipality ..	77
Table 4.19 Case Processing Summary .....	83
Table 4.20 Model Fitting Information.....	83
Table 4.21 Goodness of Fit .....	84
Table 4.22 Pseudo R-Square .....	84
Table 4.23 Parameter Estimates .....	85
Table 4.24 Test of Parallel Lines.....	85
Table 4.25 Access Road Width in Elgon View Kimumu and Munyaka.....	86
Table 4.26 Test of Homogeneity of Variance .....	88
Table 4.27 ANOVA Table .....	88
Table 4.28 Robust Tests for Equality of Means .....	89

Table 4.29 Multiple Comparisons .....	89
Table 4.30 Plot Coverage Means.....	92
Table 4.31 Mean Building Lines .....	93
Table 4.32 Mean Plot Size, Skyline and Number of Dwelling Units.....	97
Table 4.33 Summary Compliance to Planning Standards .....	99

## LIST OF FIGURES

Figure 2.1 Environmental and Dwellers Determinants of Residential Satisfaction. ....	17
Figure 2.2: Conceptual Framework.....	29
Figure 3.1 Study Area.....	32
Figure 3.2 Concurrent Triangulation Strategy.....	35
Figure 3.3 Epicollect 5 Interface .....	39
Figure 4.1 Residential Satisfaction Levels Across Neighbourhoods .....	49
Figure 4.2 Satisfaction with Number of Rooms Across Residential Neighbourhoods	51
Figure 4.3 Satisfaction with Neighbourhood Hygiene .....	52
Figure 4.4 Satisfaction with General Cleanliness and Environmental Aesthetics .....	53
Figure 4.5 Satisfaction with Rent and Mortgage Expenses Across Neighbourhoods ..	55
Figure 4.6 Satisfaction with Housing Ventilation .....	56
Figure 4.7 Satisfaction with Natural Lighting.....	57
Figure 4.8 Satisfaction with Transportation Cost.....	58
Figure 4.9 Satisfaction with Access to Public Facilities .....	60
Figure 4.10 Satisfaction with Public Security .....	61
Figure 4.11 Housing Tenure by Residential Neighbourhood.....	62
Figure 4.12 Likelihood to Recommend a Friend and or a Relative to Stay in Residential Environment. ....	62
Figure 4.13 Reason for Occupation of Residential Environment.....	64
Figure 4.14 Housing Typology and Building Material Across Residential Neighbourhoods .....	67
Figure 4.15 Number of Bedrooms across the Residential Neighbourhoods .....	69
Figure 4.16 Housing Expenditures .....	70
Figure 4.17 Distribution of Neighbourhood Attributes and Sampled Households .....	71
Figure 4.18 Mean Distance to Social Amenities .....	72
Figure 4.19 Age Distribution of Residents.....	78
Figure 4.20 Clustered Bar Graphs Illustrating Household Socio-demographic Characteristics Across Neighbourhoods.....	80
Figure 4.21 Income Distribution Across Neighbourhoods.....	82
Figure 4.22 Compliance to Access Road Width .....	87
Figure 4.23 Mean Plots for Access Road Width .....	90
Figure 4.24 Plot Coverage.....	91
Figure 4.25 Human Waste Disposal Mechanisms.....	93

Figure 4.26 Front Building Lines .....	94
Figure 4.27 Side Building Lines.....	95
Figure 4.28 Rear Building Line.....	96
Figure 4.29 Skyline .....	98
Figure 4.30 Average Observed Dwelling Units Per Plot .....	99
Figure 6.1 Existing Situation Map.....	115
Figure 6.2 Proposal Plan in one of the Neighbourhoods.....	116

**LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS**

CBD	Central Business District
CoK	Constitution of Kenya, 2010
GDP	Gross Domestic Product
GIS	Geographic Information System
GoK	Government of Kenya
KENSUP	Kenya Slum Upgrading Program
KISIP	Kenya Informal Settlement Improvement Program
KNBS	Kenya National Bureau of Statistics
KPDA	Kenya Property Developers Association
MLR	Multinomial Logistic Regression
OLR	Ordinal Logistic Regression
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UN	United Nations
UNGA	United Nations General Assembly
WEF	World Economic Forum
WHO	World Health Organization

## ACKNOWLEDGEMENT

First and foremost, I wish to express my gratitude to the Almighty God for granting me the gift of life, good health and the strength to pursue my academics. Secondly, I wish to acknowledge the tireless effort made by my supervisors Dr. Andrew Kiplagat and Dr. Benjamin Mwasi to guide me through the entire thesis writing process from the proposal stage to completion. Thirdly, I wish to acknowledge the support given to me by the entire School of Environment fraternity especially the Department of Environmental Monitoring Planning and Management for their guidance in the development of my thesis. Fourthly, I acknowledge Uasin Gishu County, Department of Housing and Physical Planning and the residents of Elgon View, Kimumu and Munyaka for sharing data that was essential for conducting the research. Last but not least my gratitude goes to my classmates and colleagues Kilimo John, Haruki Mwangi, Ngobiro Laban in the postgraduate laboratory and my research assistant Amuyunzu Amisi for the support they gave me during data collection, analysis and report writing.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Planning for residential areas is a comprehensive way of ensuring that housing constructed in a particular neighbourhood is adequate in standard and meets the needs of the occupants. It has been termed as one of the fundamental tools for realizing sustainable development and is majorly under the superintendence of local authorities (Teck-Hong, 2012). This is because planning ought to play a key role of enabling all people, more so the homeless and economically weaker sections of the society, to secure affordable decent housing by simplifying zoning regulations and providing for supporting infrastructure (Makinde, 2014). Planning solves challenges of speculation in real estate, inadequate and lack of facilities within housing sector. It also provides a good environment for housing in all sections of the society, increasing physical and social infrastructural capacity to the convenience of the residents (Habitat, 2013). This, therefore, leads to the production of liveable and resilient urban centres.

Housing is more than just physical infrastructure. It is a community infrastructure that developers must think of wholistically if it has to satisfy a population's housing needs. Housing development must therefore provide for amenities such as schools, health facilities, places of worship and green spaces to create a living area that provides residents with a sense of ownership of their housing (Van Noppen, 2012).

In Kenya, the housing need of the citizens is barely satisfied. With an urban population growth rate of about 4.2% p.a., 22% of the Kenyan population reside in urban areas (Hakijamii, 2012). This has continued to lower the quality of housing as developers' main aim is to maximise profit with less concern on the quality. As a result, prices for decent accommodation have more than doubled pushing the low and middle-income

groups that comprise of 60-70% of urban dwellers out of the formal housing market. Instead, this population lives in poor quality dwelling units in the informal settlements (Mwaniki et al. 2015; Ondieki, 2009; Van Noppen, 2012). To fill the gaps in housing quality and quantity, it is imperative to understand the degree to which people are content with their present housing units and environments wherever they are. Further, factors underlying different levels of residential satisfaction should be well understood for planners to better plan for increased access to formal housing (Teck-Hong, 2012). Residential satisfaction is a sense of fulfilment when a person has or realizes what he or she desires in a residential environment. It has proven to be fundamental in understanding individual's perception of the general quality of life (Mohit & Raja, 2014). Residential satisfaction has also helped in assessing the success of neighbourhood developments by both the private and public sector, foreseeing possible residential mobility and defining deficits in residential neighbourhoods (Mohit & Raja, 2014). This is because residential satisfaction is an individual reaction to the specific housing attributes. These attributes are the dwelling unit features and neighbourhood features, which are the factors that planning seek to influence through housing planning standards (Liu, 2005). Residential satisfaction is therefore essential in improving the qualitative and quantitative access to housing as it enables understanding of housing needs, influencing and directing future public and private investment in housing development.

Besides the dwelling unit features and neighbourhood features that influence residential satisfaction, the need for and access to housing of desired quality is saliently driven by the socio-economic attributes of the households occupying those residential developments (Mohit & Raja, 2014; Wu, 2001). The success of residential planning is dependent on a number of some fundamental aspects including demographic structure,



socioeconomic attributes of a population, land uses, housing stock, existing physical and social infrastructure and environmental considerations (Byun & Ha, 2016). This, therefore, means that to have successful residential planning that addresses residents' needs, one must understand how the stated factors, that is socio-economic factors, dwelling unit features and neighbourhood features influence housing satisfaction in each context (Teck-Hong, 2012).

Most residential developments in Kenya lack a definite urban development framework (Olima, 1997; Syagga, 2011). Consequently, challenges of urban pressure due to overcrowding and human settlements beyond the carrying capacity have been on the rise. It is not known how this has impacted on residential housing satisfaction due to limited to no research in housing satisfaction (Mwaniki et al. 2015).

Recent studies on the housing situation in Kenya show that, despite the deficit in housing supply, a number of houses in urban areas remain unoccupied especially in the outskirts of Nairobi city due to misalignment between housing needs and housing supply. It is therefore essential that the development of fresh housing developments take into considerations other important social infrastructure that goes alongside housing development. This includes socio-economic conditions of the targeted population and even their aspirations in housing. Unoccupied housing is an indication of the lack of balance between housing supply and the needs of those intended to occupy those houses (Mwololo, 2020). As Salleh (2008) points out, once a balance is reached between the housing situation and housing aspire for many households become satisfied.

## 1.2 Problem Statement

There exists little in literature on residential satisfaction studies especially for housing projects undertaken in developing countries (Aigbavboa & Thwala, 2018). This has consequently resulted into the deterioration in individual housing quality in the third world where 60 to 70% of the urban population reside in informal settlements (Amnesty International, 2009). A people's satisfactory evaluation of a product or a service serves to bring forth improvements to better the product or service (Abidin et al., 2019). As such, the failure of laudable housing projects in developing nations has been attributed to the non-existence of information on the determinants of residential satisfaction (Byun & Ha, 2016; Jiboye, 2014). It is not yet clear on how households form their housing satisfaction (Aigbavboa & Thwala, 2018; Yiping, 2005).

In Kenya, since the first domestic housing policy in Sessional Paper No. 5 of 1966/1967, housing development has mainly focused on quantity whereas housing quality has been deteriorating (Muraguri, 2011). The scarcity of information on residential satisfaction has led to poor decision making by planners and policy-makers which do not solve the housing challenge (Van Noppen, 2012). In Nairobi for instance, about 2.5 million people (60%) of the municipal population reside in slums such as Kibera on land making up only 6% of the entire municipal land (Amnesty International, 2009). Eldoret municipality on the other hand has experienced an ad hoc implementation of good residential development standards with housing largely being produced informally (Ngetich et al., 2014). Land prices and house-rent has increased tremendously leading to more informal settlements. About half of the population in Eldoret municipality lives in dilapidated and semi-permanent structures which are unplanned with high density and inadequately serviced (Cheserek and Opata, 2011).

### **1.3 Objectives**

#### **1.3.1 Main Objective**

The broad objective of the study was to determine to what extent residential housing satisfaction attributes are considered in planning for residential neighbourhood development in Eldoret Municipality

#### **1.3.2 Specific Objective**

The specific objectives include;

1. To assess levels of residential satisfaction across neighbourhoods
2. To determine the relationship between selected housing attributes and residential satisfaction
3. To determine the relationship between selected household socio-economic characteristics and residential satisfaction
4. To determine the extent of compliance to selected residential planning standards

### **1.4 Hypothesis**

1. Residential satisfaction varies depending on the housing attributes accessed by the occupant
2. There's no relationship between housing attributes and residential satisfaction
3. There's no relationship between household socio-economic characteristics and residential satisfaction
4. There's no relationship between compliance to selected planning standards and residential housing satisfaction

## **1.5 Justification and Significance of the Study**

Kenya desires to house every citizen in a dwelling unit that meets their needs as outlined under Article 43(b) of the Kenya Constitution 2010. In this regard, the government rolled out The Big Four Agenda in 2018 among other goals, as a way of minimizing the deficit in housing supply across urban areas. Conversely, there's little emphasis on the contribution of the supposed beneficiaries of housing developments in ensuring that housing developed under the programme satisfies their needs and aspirations. In housing programmes targeting low-income groups, it is important to ensure that such housing is not only adequate but also meet the housing needs of the occupants. Understanding residential satisfaction is thus critical as a measure for success in housing programmes as well as guiding future housing developments (Van Noppen, 2012). Housing satisfaction being the perceived gap amid occupant's needs, ambitions and the reality of their existing residential situation. It is therefore critical in informing public policy and planning interventions for future housing units (Galster, 1987; Günther, 2009). The study will help explore the underlying factors affecting residential satisfaction which will guide in the provision of proper housing to serve the needs of the people. The study will help in the identification of prerequisite for the development of new housing projects. Tenants, house developers and home owners will benefit from the study as it will identify which attributes of housing environment are fundamental to the people. The study findings will thus serve to inform the review of housing policies and instruments.

## **1.6 Structure of Thesis Report**

This thesis is organized into Six Chapters. Chapter one is introductory section focusing on contextualizing the study, problem statement, objectives, study hypothesis, rationale and significance of the study. Chapter Two is on literature review with its basis on the

empirical, theoretical and conceptual aspects. Chapter Three presents the research design and methodological framework. Chapter Four gives the findings of the study presented in statistical relevance. Chapter Five presents the discussion of the study findings in comparison with similar studies while chapter six covers conclusions and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Overview

This Chapter presents a review of the works relevant to the study. The Chapter delves into housing as a subject and while on it, reviews residential planning standards, residential satisfaction, housing attributes, effects of socio-economic attributes on residential satisfaction and theoretical framework. Thereafter, it demonstrates the research gap and goes ahead to present the study's conceptual framework.

#### 2.2 Housing Planning Challenges

Housing planning impacts on sustainable provision of housing in urban environments (Yakob et al., 2013). Creating a balance between the three major pillars of sustainability that is social, economic and the environment in housing development has proven to be challenging. Despite increasing and supporting the economy of a country, development of housing also creates negative environmental and social impacts. Some of the issues in and challenges related to housing development in planning perspectives as viewed by Choguill, (2008) are worth examining.

Provision of public open space is one of the most highlighted components of housing in urban areas. The establishment of public open space inside residential neighbourhoods to cater for the diverse needs of diverse groups within the population is important. Scarcity of land in urban areas due to competing land uses make it difficult for inhabitants to access open spaces. This highly affects poor households. Competing land uses as explained by the bid rent theory of Alonso which allows urban land to be allocated to use with the highest rate of returns and it is mainly fuelled by the upper-income group that has high purchasing power to such resources (Yakob et al. 2013).

Lack of coordination between key stakeholders has been highlighted by housing developers as an impediment to sustainable housing development. The process of getting approval for housing planning permission has been cited as one of the inhibitors of housing development. Dealing with improvement plans, development standards, planning applications, development decision and communication are not well laid down (Ngetich et al., 2014).

Societal equity and fairness in metropolitan housing has mostly affected the poor. Despite the intent of housing policies to cater for the needs of all clusters of population, poor people have always had challenges accessing better quality life. For example, the Kenyan government has always had programmes for affordable housing to provide shelter for the low- and medium-income people and yet the quality of housing and the living conditions in their environments are still disappointing (Mose et al., 2018). Marginalization must be dealt with in the development process to ensure the poor benefit from development rather give advantage to the upper-income group (Ondieki, 2009; Van Noppen, 2012; Yakob et al., 2013).

Housing necessity versus home buyers needs influence production and utilization of housing. The overconsumption of accommodation often results in environmental deterioration especially by the affluent who are more attracted to the suburban residential developments, unlike the poor who reside in the city centre. Further, the amplified housing cost is argued to be grounded on housing want rather than needs and which in turn pushes the urban poor into living in squatter settlement (Choguill, 2008 & Yakob et al. 2013).

Rapid urban growth has been mainly associated with rural-urban migration as a result of pull factors such as employment opportunities generated through industrialization, healthier city communal amenities and better urban living neighbourhoods (Salfarina et

al. 2010). Majority of urban poor dwellers have little or no access to formal low-cost housing programmes to support the increasing number of migrants to the city. This thus compels them to reside in informal settlements that are quicker and cheap to build (Salleh & Badarulzaman, 2012). As such, issues of poor hygiene, poor drainage, poor waste management and uncertainty of tenure have remained dominant.

### **2.3 The Role of Residential Satisfaction Studies**

Satisfaction studies have been one of the dormant areas of research in social psychology. Areas of research include consumer satisfaction, job contentment and satisfaction are not a new thing in our literature (Yiping, 2005). It was long established that individuals' satisfactory assessment of service or a product when identified and implemented can bring forth improvements that can increase the effectiveness of a product or service (Gifford, 2014).

Research on residential satisfaction was first introduced in the western countries during the sub-urban development and housing explosion period of the 1950s and early 1960s. To guide upcoming housing improvement, living forms and principal urban reconstruction was done through shanty town redevelopment programmes (Mohit & Raja, 2014). Developing countries are undergoing a similar experience of urbanization as a consequence of hasty industrialisation and economic development. Governments in these states, have been aiding the development of diverse houses for different income clusters. In Kenya, the Civil Servants Housing Scheme Fund under the 2004 National Housing Policy called for employers to facilitate employees to acquire housing. The Big Four Agenda, one of its core focus as affordable housing. The provision of decent shelter to the citizens is a priority to the Kenya governments Article 43b of (CoK 2010). Researches in housing satisfaction in the emerging economies are limited to the point at which it is not possible to ascertain the level to which houses developed by both the private and public segments meet the ambitions of the people (Aigbavboa & Thwala,



2018). Residential satisfaction is described as one of the most dynamic constructs. Its meaning depends on factors such as habitation, time and the goal of the assessment, the value system of the assessor that is designers, organisers, sociologists, psychologists and city geographer (Erdogan et al., 2007).

#### **2.4 Understanding the concept of Residential Satisfaction**

Residential satisfaction has been defined from both one dimension and multidimensional perspectives by a varied range of experts. Onibokun (1974), well-defined residential satisfaction as a spatial fact, it is a cumulative fulfilment arising from both the dwelling unit and the neighbourhood component of housing. On the other hand, Satsangi and Kearns (1992) referred to housing satisfaction to be a psychological fact and a complex attitude. In the same light Lu (1999) also referred to residential satisfaction as a multifaceted cognitive concept. On the other hand, Galster (1985) had a different thought where he referred to residential satisfaction as a social aspect.

However, unlike the above one-dimensional definitions of residential satisfaction, multi-dimensional thinkers such as Bechtel and Bechtel (1997) submitted that housing fulfilment is influenced by not only the dwelling unit and its physical parameters but also the bordering neighbourhood and the societal quality of the immediate environment. Residential satisfaction is a peoples' reaction to the localities in which they reside. In this case, the environment is the physical aspects of the residential context that is dwelling, housing developments, communities, social, economic, organizational and also institutional facets determinants of residential satisfaction (Francescato et al. 1987). Residential satisfaction is an excellent societal pointer utilized by neighbourhood developers, specialists and policymakers equally (Galster, 1985). It is engaged to assess residents' perceptions of and feelings for their homes and the environment. It also

elucidates the level of contentment experienced by a person or a household member regarding their present home conditions (McCrea et al., 2005; Ogu, 2002).

The concept of residential satisfaction is directly linked to planning discipline such that the appeal to comply with planning standards is aimed at ensuring that housing development is habitable and up to standards. Planning sets up standards and regulations to guide the development of major key components of residential areas in same regard residential satisfaction is a subjective response to these components involving dwelling unit and neighbourhood components (Byun & Ha, 2016). Development planning guidelines such as accessibility, number of dwelling units per plot, plot coverage, building lines and skyline are meant to mitigate major challenges that arise from unplanned development which may lead to low residential satisfaction of the residents. As such, residential satisfaction is a vital tool in assessing whether housing developments in a country are up to the planning standards and regulations for human habitation (Galster, 1985). It is also useful in determining how well the housing sector in a country meets the needs of the citizens (Teck-Hong, 2012). Development in the housing sector must seek to understand what citizens' desire in a house to solve the housing challenges in the nation. Housing developers must understand that housing is not just a simple structure to be developed on land without major considerations to other essential services and infrastructure that go alongside it. This can be done by studying the attributes which affect satisfaction to develop housing that is desirable and meets the expectations of the occupants (Ogu, 2002).

Satisfaction is an important determinant of individuals' discernments of overall quality of life. It is as an ad hoc evaluative basis for judging the attainment of residential developments. Emergent residential relocations may disrupt housing demand, supply and neighbourhood change. This valuation of discernments of residents' shortfalls in

their present-day housing situation can be employed to improve future private and public housing developments (Mohit & Raja, 2014).

## **2.5 The Origin of Residential Satisfaction**

Residential satisfaction is employed interchangeably with housing satisfaction. Housing refers to a combination of general physical and social components that form the housing system rather than just a person's house alone (Francescato et al. 1987; Lu, 1999). Housing is further described as being a multidimensional phenomenon that has different structural typologies, for example, single-family, different tenancy, site, among others (Mohit & Raja, 2014).

Satisfaction on the other hand is the outcome of the course of assessment amid what was received and what was anticipated. According to Galster (1987), satisfaction is not only conditioned by physical aspects, but also by the ability to form social networks.

## **2.6 Theories Related to Residential Satisfaction**

The difference between household current housing condition and preferred housing and surrounding situations forms the basis of residential satisfaction theories (Galster & Hesser, 1981). The five main theories of residential satisfaction include Housing Needs Theory, Housing Deficit Theory, Psychological Construct Theory, Neighbourhood Concept as well as the Systems Theory.

### **i) Housing Needs Theory**

This theory was postulated by Rossi (1955) who introduces the idea of 'housing need' to conceptualize housing satisfaction/ dissatisfaction. It states that housing needs and desires vary as households move through different life cycle stages and this creates a discrepancy between household needs, their housing and neighbourhood situations as explained by Maslow's hierarchy of needs. This creates stress or dissatisfaction for the household with their current housing. As a result, these may lead to migration as a way

of adjustment to housing needs. As a household goes through different life cycle changes, it experiences a varied housing space requirement that affects their housing needs over time. This, therefore, means that families are expected to feel discontented when their dwelling units and neighbourhoods do not live up to their housing needs and ambitions.

### **ii) Housing Deficit Theory**

This theory was postulated by Morris & Winter (1978) where they made known the concept of 'housing deficit' to describe residential fulfilment or discontent. In the housing adjustment model, they theorized that people critic their housing situation concerning normatively defined standards comprising racial customs defined by shared values or rubrics for living environments, and household/ individual standards which results into families' standards for living. As such, if the actual housing conditions do not conform to the social and or household housing standards, a housing deficit is experienced which results in residential discontent. Families experiencing a housing deficit is likely to contemplate some type of housing change through revision of their needs or improving their housing situations through remodelling.

### **iii) Psychological Construct Theory**

It was postulated by Galster (1985). The Psychological Construct theory is underpinned on the view that individuals cognitively construct a reference point for each specific aspect of their residential condition (Galster, 1985). The amount and or superiority of the particular aspect inferred by the reference point depends on the household's self-assessed needs and ambitions (Galster & Hesser, 1981; William, 1976). If the present situation is seemingly in proximate similarity with or superior to the reference point, a mental state of satisfaction is exhibited. Otherwise, if the existing state falls short of the reference point by more than a brink deficiency then one may try to resolve the deficit

in by adaptation that is redefining wants, lowering ambitions and or changing the assessment of the present state hence manufacturing a minimum fulfilment. If not able to adapt to the present housing setting, dissatisfaction is expressed. However, as time goes by dissatisfied residents might attempt to ameliorate discontent by changing the state of affairs in the present house or by relocating to another, more fitting housing condition (Foote, 1960).

#### **iv) Neighbourhood Concept**

Postulated by Clarence Perry, the 20-minute neighbourhood standard is based on developing walkable compact places that are 800m walk from a household to destination and back again. It recognizes that habitable places are developed on a human scale to encourage walking rather than the use of cars. This approach to planning has been found to have multiple benefits including improved public health, improved safety, and robust social connections. It also lessens emissions, lowers household costs and promotes environmental, economic and social sustainability (Shannon et al. 2019).

#### **v) Systems Theory**

A system defined as a group of interacting components with defined boundary working towards a common goal. Systems theory has been vital in environmental planning and management. Housing just like a system is a combination of the whole physical, social and infrastructural constituents that make up the community and or the neighbourhood at large (Francescato et al. 1986). More so, housing is a multidimensional phenomenon comprising physical type (e.g., single-family home), tenancy (own or rent), site and political jurisdiction. Defects in one component of a system may cause inefficiency in the whole system. Similarly in housing development inadequacy in planning some of the components such as waste management, water, social amenities among others may lead to dissatisfaction among the residents.

## **2.7 Reflection on Residential Satisfaction Theories**

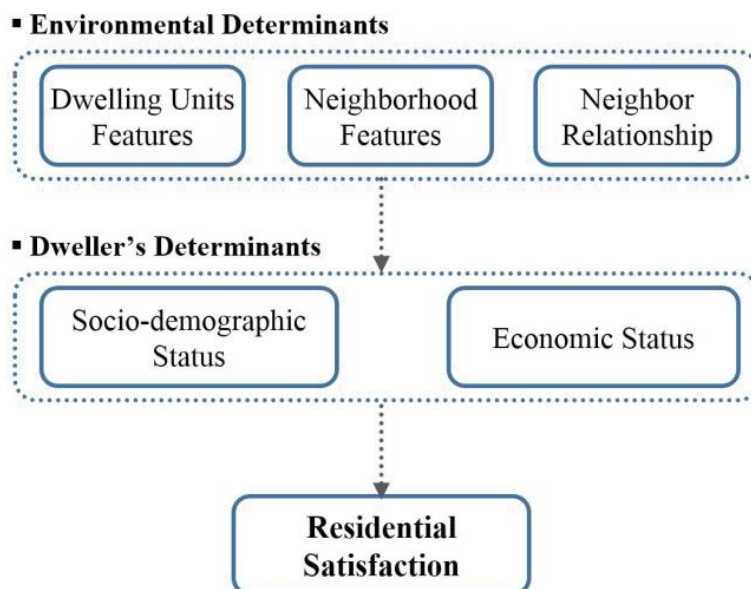
Past pragmatic research on residential satisfaction has employed the use of either a single or a number of the earlier stated residential satisfaction models (Mohit & Raja, 2014). Several selected variables representing dwelling unit and neighbourhood features, persons' socio-economic characteristics along with their perceptions of the dwelling unit and neighbourhood settings have been assessed in several residential housing studies (Lu, 1999). These theories were fundamental in describing the underlying factors that affect the individuals' perceptions of their residential environment. They were thus crucial in conceptualizing the study and identifying the variables for the study.

Before the reform of housing system in China, housing demands were only quantity based. With the new commercial housing development regimes, housing needs have slowly shifted to housing performance and quality. The degree of residential satisfaction has become a significant indicator of housing procurement determination as they reflect the consumers quality of residential environment (Yin, 2018). Among the attributes that impact residential satisfaction include user characteristics, the housing physical condition, social space state, location advantage, property services, public facilities and environment (Li, 2014).

## **2.8 Empirical Studies on Residential Satisfaction**

Residents' and environmental characteristics have been the most significant variables of study in research on residential satisfaction. Residents' characteristics are the socio-demographic and behavioural characteristics while environmental characteristics are the dwelling unit and neighbourhood attributes (Byun & Ha, 2016; Mohit & Raja, 2014). Unlike behavioural characteristics which considered as a result of the dynamic interaction, socio-economic, neighbourhood and housing unit attributes are considered

essential in determining residential satisfaction levels (Mohit et al., 2010). Figure 2.1 illustrates the environmental and dweller's determinant of residential satisfaction.



**Figure 2.1 Environmental and Dwellers Determinants of Residential Satisfaction.**

(Source: Byun & Ha, 2016).

#### i) Dwelling unit Characteristics

Besides sociodemographic attributes of residents, dwelling unit attributes have recorded a very significant impact on residential satisfaction. These according to empirical studies are structural features such as the number of rooms, size, quality of housing units, housing cost, privacy, ventilation and lighting, hygiene such garbage disposal, persons per room ratio (social density) and location of the kitchen (Ariffin et al. 2010; Elsinga & Hoekstra, 2005; Hipp, 2010; Mohit & Raja, 2014; Morris et al. 1976; Morris & Winter, 1978; Parkes et al. 2002; Rowley et al., 2015). According to Mohit et al. (2010) and Morris et al. (1976), a positive association exists between the number of rooms and housing fulfilment. Peck, (1981) and Peck & Kay Stewart, (1985) research showed that the number of individuals in a house was inversely related to housing satisfaction. Their study showed that as the number of persons per room rises, causing

a higher concentration in the living environment, the level of residential satisfaction decreased. Dwelling unit structural quality and age of dwelling unit are also related to residential satisfaction (Mohit & Raja, 2014). A negative interaction existed between the age of the housing unit and residential satisfaction where individuals occupying older houses showed less satisfaction. Specifically, type of dwelling structure, house price and length of residency also showed an impact on residential contentment (Mohit et al. (2010). In the same regard, Baum et al. (2010), Hipp, (2010), Parkes et al. (2002) and Teck-Hong, (2011) identified housing structural attributes for instance kitchen area, washing areas, space in the living room and dining space, design, quantity of sockets, rooms available in the house and lavatory and supplementary features of housing such as housing superiority, privacy, and housing services delivered by landlords such as waste management, security, illumination and aeration of the house as important elements of housing satisfaction.

## **ii) Neighbourhood Characteristics**

Neighbourhood attributes have been stated as important predictors of residential satisfaction (Lu, 1999). Research by Morris et al. (1976) highlighted that households assess a neighbourhood with regards to the normatively defined standards: first, the zone should be chiefly residential. Secondly, accessibility to a good education. Thirdly, good boulevards and roads and fourthly, homogeneity regarding social class, race and ethnic group. Dissatisfaction in a neighbourhood is mainly due to increased distance of travel for school, work, shopping, health facilities and the geographic setting of housing estates. Consequently, user-friendliness of public transport, shopping services and physical environment features have been acknowledged as fundamental determinants of residential satisfaction (Abidin et al. 2019; Mohit & Raja, 2014). However, unlike housing which could likely be a cause of residential fulfilment, some features of the



neighbourhood for instance levels of crime, deficiency in amenity, industrial establishments or workplace areas may lead to discontent (Mulliner & Maliene, 2012; Parkes et al. 2002). Despite little research on the relationship between residential satisfaction and factors such as safety from physical accidents, Abidin et al. (2019) suggested that they might have an impact on housing satisfaction. Nevertheless, Mohit et al. (2010) suggest that privacy is of importance to residential. Other neighbourhood characteristics that have an effect on residential satisfaction according to Oh (2000) include communal infrastructures such as recreational area, outdoor play area, and transport facilities in the housing area. As such, the role neighbourhoods play in residential satisfaction remain to be significant (Ariffin et al., 2010; Salleh, 2008).

### **iii) Socio-economic Attributes of Inhabitants**

Essential socio-economic attributes recognized as predictor variable according to past empirical studies on residential satisfaction include income, ownership of a house, age and duration of residence (Lu, 1999). Age, income, level of education and homeownership have a positive impact on residential satisfaction. Baum et al. (2010); Chapman & Lombard (2006); Lu, (1999) and Pinqart & Burmedi, (2003) found that elderly members of the society tend to be more contented with their housing than young individuals. On the contrary, Mohit et al. (2010) disputed by arguing that the relationship between age and housing satisfaction is inverse. This according to him is that as people get older, their housing needs change hence feel the urge to modify their housing to be congruent with their current state. Higher-income on the other hand empower households to move to a fitting house in better neighbourhoods leading higher satisfaction levels (Adriaanse, 2007; Frank & Enkawa, 2009; Lu, 1999). The higher the education the more satisfied households are (Vera-Toscano & Ateca-Amestoy, 2008). Nonetheless, Lu (1999), recorded an insignificant impact by education on residential

satisfaction. Homeownership gives a sense of self-gratification to owner-occupiers making them psychologically proud and satisfied with their dwelling units as opposed to renters (Barcus, 2004; Elsinga & Hoekstra, 2005; Kaitilla, 1993; Lu, 1999)

## **2.9 Implications of Residential Satisfaction on Urban Planning**

Urban planning in developing nations such as Kenya began courtesy of Western colonial legacies specifically the British planning system (Ogu, 2002). Even so, these planning processes have been under criticism because they promote middle-class values of planning professional and policy makers and for applying borrowed standards from the western nations to the demise of low-income sections of the urban population (Majale et al., 2012). Further, it has been argued that this kind of urban planning favours conventional infrastructure even in the face of inadequate public resources to implement the planning stipulations. Traditional services are often exemplified by urban policies where public agencies implement the building codes and regulations made by technocrats (Ogu, 2002). Residential satisfaction concept seeks to change this form of planning to develop housing that is human-centric. This is in line with the global agenda of sustainable development. Participation is a key principle of sustainable development is employed residential satisfaction. People are asked to state their satisfaction levels with various housing components. When dealing with planning controls, residential satisfaction informs planners to determine the components that are significant in the provision of high-quality residential environments important to the needs of the people. In this regard analysis of residents' satisfaction with housing and environmental conditions serve well as a means to public participation (Aigbavboa & Thwala, 2018; Hipp, 2010; Mohit & Raja, 2014). More so, the necessity of examining the impacts of residential satisfaction for metropolitan design and administration are prevalent. The assessment of societal and equity concerns in housing and amenity delivery appraises

residential satisfaction (Hipp, 2010; Ogu, 2002; Parkes et al. 2002). This is because town improvement and design is for the society and as such, proper cognisance of social, economic, cultural and interrelated environments in any urban area, nation or region is essential (Ogu, 2002).

The two major approaches in literature employed to assess residential quality are categorized into economic and non-economic determinants of quality (Troy, 1973). Residential satisfaction is an example of a non-economic method of quality assessment whose techniques is to measure residents' perception towards housing which may serve to insinuate housing quality (Arimah, 1992; Awotona, 1988, 1990; Ogu, 2002; Rent & Rent, 1978). This, therefore, means that besides monetary value good quality housing development accrues to the nation, it leads to the general psychological well-being of the people which can only be quantified by assessing residential satisfaction.

In the face of persistent infrastructural challenges experienced in developing countries especially in the low-income regions, the old-fashioned planning a colonial legacy is insufficient to deal with present-day planning challenges UN-HABITAT, (1996). Given the unsubstantial increase in public finances in most developing nations, the implementation of conventional infrastructure systems and major housing programmes is a tall order to most governments. As such, with the present decline in urban fabrics, the incorporation of residents' ambitions and contribution in the design and administration practise is key to designing practicable and applicable ways out of poor-quality housing and service challenges. It is also a way of soliciting local input in decision making and planning process (Ogu, 2002; Parkes et al. 2002; Vera Toscano & Ateca Amestoy, 2008). It is therefore vital that developing countries employ the use of residential satisfaction in town planning and improvement predominantly in sections where urban dweller reside in health-threatening conditions. Satisfaction studies give us

an understanding of the extent of residential needs, service delivery and service enhancement as may per the need.

### **2.10 The Nexus Between Urban Housing Planning Standards and Housing Satisfaction**

The development process has its shortcomings which may have an adverse influence on the health and wellbeing of the society (Doeringer et al. 1987). Different countries have employed unique planning standards to address these shortcomings. Planning standards are thus essential in regulating the provision of fundamental neighbourhood and dwelling unit features including utilities that are vital in sustaining quality living.

With the increasing demand for better residential environments, planning control ensures that preparation of plans for housing development envisions good quality of living environments (Rameli, 2009). Planning is a legislative and a state endeavour where county administration is mandated with preparing improvement plans to guide and standardize the development in their jurisdiction. In Kenya, county governments are mandated to manage housing schemes as stipulated by the County Government Act 2012 and the Urban Areas and Cities Act 2011, laws of Kenya. Sustainability concepts focus on three main pillars that are social, economic and environment. Per se housing is essential in accomplishing this goal as it has a significant impact on those three dimensions of sustainability (Yakob et al. 2013).

With the increasing global urbanization, pressure on urban economy, infrastructure and facilities often lead to environmental problems. In Kenya the Big Four Agenda was put in place to ensure that housing is provided on a sustainable basis. Its implementation however, is still inadequate as a result of low stakeholder engagement, limited expertise in sustainable housing among county governments and housing developers and the cost constraints in its operation and maintenance. Most sustainable housing programmes in

Kenya mainly focus on design, construction and technology rather than planning for sustainable housing development (Hakijamii, 2012; Mose et al., 2018; Van Noppen, 2012).

### **2.10.1 Housing Development Plans**

The development plans that are structure plans, as well as local plans, are developed by county governments as stipulated by the County Government Act (2012) and the Urban Areas and Cities Act 2011 CoK (2010). These plans are the foundation upon which development application is assessed, identify forms and setting of land use for residential establishment. Effectuation of these development plans serves to monitor housing developments. Types of plans prepared to guide housing development, include;

#### **i) Structure Plans**

These are written statements of the programmes and schemes concerning the broad development and land use, encompassing social and economic aspects and physical environs of the region backed by statistics, photographs and illustrations. This practice of developing plans must, according to the CoK (2010), involve public participation before being publicised and gazetted. In the case of residential developments, the generation of development plans as a means of fore planning examines the present residential setting, articulates housing policies and also govern future housing needs for the entire structure plan zone in broad (Ngetich et al. 2014; Physical Planning Handbook, 2007; Rameli, 2009).

#### **ii) Local Plans**

At the local level, the two plans delivered are local plan and special zone plan. Local plans are highly detailed compared to structure plans where they consist of comprehensive planning courses of action such as permissible density, structure height and setbacks, proposed land usages such as residential, commercial, industrial, services

and open space. Local plans also play a crucial role of forecasting future housing requirements, provision of land area for residential purposes and supply of appropriate land sites yet to come housing development (Ngetich et al., 2014; Physical Planning Handbook, 2007).

### **2.10.2 Planning Control in Housing Development**

The process of housing developments begins from the procurement of parcel phase and stops at the selling of dwelling units established. Planning has a key role at the phase of getting legislative approval phase. Claims have been made that planning controls only come in when a submission for housing authorization is made to the county planning establishments or land agencies (Ngetich et al., 2014). Nevertheless, in consideration of the design authorization, planning agencies consider several guiding principles and rules including planning ethics and protocols. For example, when the county planning authorities assess planning authorization requests, it must ensure that the suggested improvement is in line with the present local plan or those being put in place. Under normal circumstances, the efficiency of housing planning regulation protocol is determined based on alignment with the suggested land use district and low-cost residential housing programmes as provided for in the development plans, and with regards to planning regulations such as permissible housing density, variety of residential development among others (Ngetich et al., 2014; Physical Planning Handbook, 2007; Rameli, 2009).

## **2.11 Policy, Legal Context and Institutional Framework of Residential Housing Planning in Kenya**

The rationale of enforcing planning standards on both private and public land is to create an improved environment for the safety and better health of the society (Dissanayake 1987). Different countries have employed unique planning standards to address the

shortcomings of the development process. The most common approaches of planning in Africa include master planning, action planning and structure planning. In the country Kenya, urban planning remains vested within the authority of two bodies that is Ministry of Lands, Housing and Urban Development and the County Governments. These institutions are guided principally by the Physical and Land Use Planning Act 2019, Urban Areas and Cities Act (2011), County Government Act 2012 and the National Land Commission Act (2012). Non-compliance to planning regulations leads to various negative consequences to the society and the developer. This includes unhealthy environments, lack of aesthetics, inadequate parking and children's playgrounds, inadequate space for the provision of public amenities e.g., solid waste management landfills, drainage infrastructure, sewer management systems among others (Gatabaki Kamau & Karirah-Gitau, 2004). Public participation is one of the major principles of governance under the CoK (2010). As one of the functions mandated to the government, the planning process requires public participation. As such, the employment of residential satisfaction in planning for housing development is indispensable to a wide-ranging understanding of the public housing needs (Parkes et al. 2002).

## **2.12 Integrating New Planning Concepts into the Existent Land Use Planning Principles**

Aligning the new planning concepts into the existent land use principles is a complex task. More so, doing away with the existing planning principles and planning standard is a costly endeavour. To achieve the best outcomes that promote sustainability, planners are normally faced with the challenge of using traditional planning standards as they are or compromising them to achieve better planning outcomes (Iravani & Rao, 2020). There are various ways to adjust the planning activity to avert weaknesses of existent planning standards to generate an integrated, equitable and sustainable planning

approach. From this basis, it is time to rethink and set renewed standards for urban, rural and regional planning and the need for environmental improvement for sound changes in land use planning. Urban design factors have an impact on public health in several ways including physical activity, pollution exposure, mental well-being, affordability among others (Iravani & Rao, 2020). As a result, the new paradigm in planning advocates for growth control, smart growth and new urbanism. However, the two popular movements that have attained high legitimacy are smart growth and new urbanism.

### **2.12.1 Smart Cities**

As stated by the Environmental Protection Agency (2004), smart growth is the development that works for the economy, the community and the environment alike. It shifts the traditional view of development from growth or no growth problem, to by what means and where new developments ought to be undertaken. This view has proven to be appealing to the extent of receiving a lot of advocacy from developers, policy makers and people with concern in urban and regional development (Iravani & Rao, 2020). Although the origin of the smart growth concept is not clear, it is believed to have originated from three key projects in the mid-1990s when the American Planning Association introduced Growing Smart, a scheme that led to Growing Smart Legislative Guidebook titled 'Model Statutes for Planning and Management of Change' in 1997. Further, in the same period, 'The Tool Kit for Smart Growth' book providing model plans for encouraging densification, diverse land uses and transit-oriented development was produced (Burchell et al., 2000). The state of Maryland also, in the same year (1997), approved the Smart Growth and Neighbourhood Conservation Act that promoted slum redevelopment, living close to your place of employment, concentrating infrastructure in priority areas, conserving countryside heritage lands and



geographically concentrating income-generating opportunities. Ever since the smart growth principles have gained global recognition. This comprises generating a variety of housing opportunities and choices, creating walkable neighbourhoods, mix land uses, promoting societal and stakeholder partnership, nurturing unique eye-catching spaces with a robust feeling of place, making development resolutions foreseeable, non-discriminatory and economical, winning benefit of compact development design, strengthening and guiding development towards the needs of prevailing communities, provide a multiplicity of transport choices and conserving green spaces, countryside, natural beauty and environmental hotspots.

The UN-Habitat under the flagship programme ‘People-centered smart cities’, promotes the use of technology and innovation to promote sustainability, inclusivity, prosperity and human rights in cities. One good example is the Masterplan developed in 2017 by UN-Habitat in collaboration with the Rwanda Ministry for Youth and ICT and Smart Africa Alliance. It provides a framework to guide Rwandan Cities and urban centres in an effort to transform digitally into sustainability and inclusivity. The adoption of the masterplan by Rwandan government is quickly transforming to a regional leader in implementing Smart city Technology in Africa (Mwaura 2017).

### **2.12.2 New Urbanism**

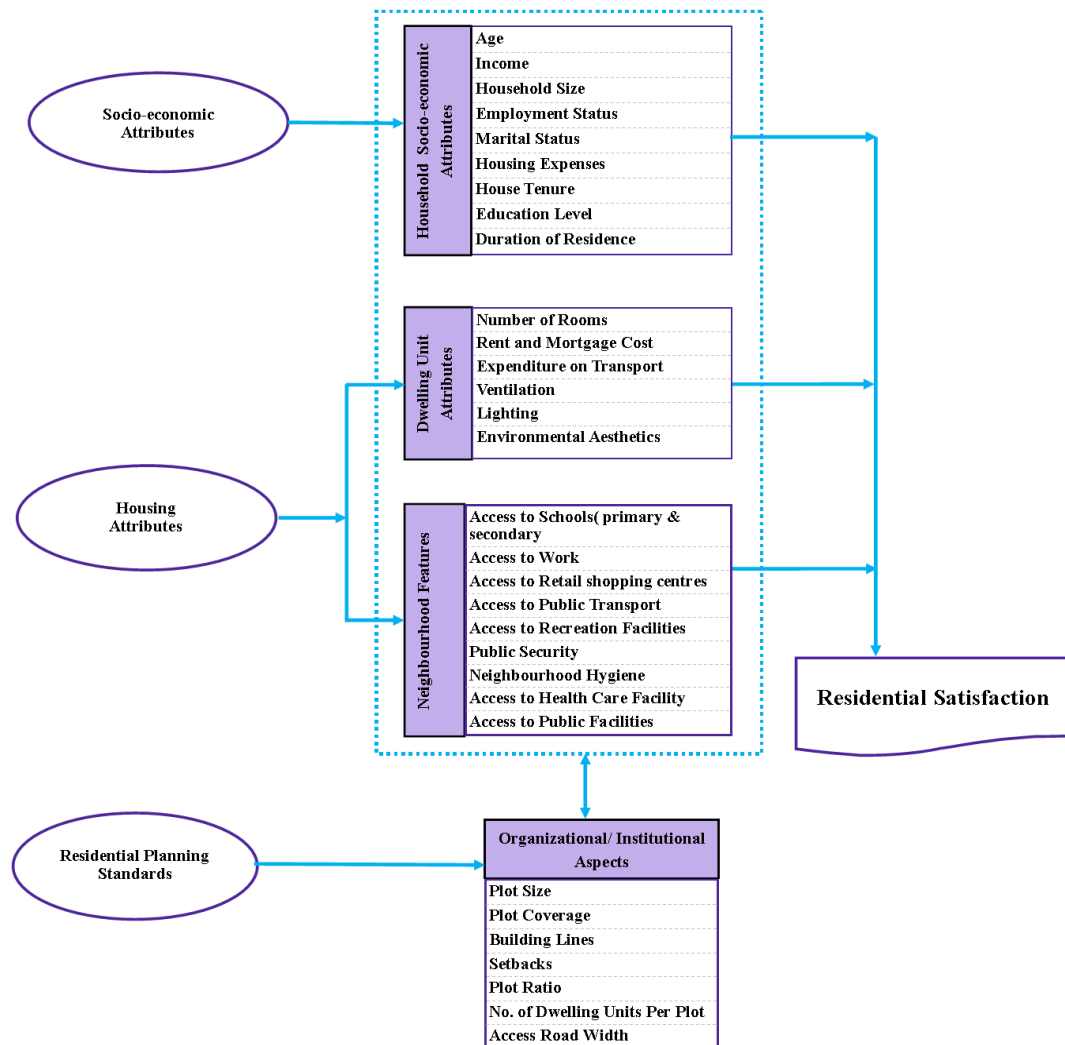
New Urbanism and Smart Growth though seemingly the same, they vary one in origin. Smart Growth originated from a group of conservationists, policy planners whereas new urbanism was mainly postulated by architects and physical planners. Further, New urbanism is an all-encompassing term to refer to the traditional neighbourhood concepts, the pedestrian pockets of Kelbaugh, the transit-oriented designs of Calthorpe and the quarters method of Leon (Bohl, 2000). Further, the new urbanism draws from American metropolitan planning that is Progressive Era town planning, the Garden Cities crusade

and the regionalism of Lewis Mumford (Iravani & Rao, 2020). New urbanism ideologies function based on a variety of issues that is buildings, plots and districts, neighbourhoods, districts and corridors and cities and regions in entirety. Similar to smart growth principles new urbanism advocate for organizing development in metropolises, towns and communities that are compact, walkable, mixed-use, transportation friendly and with a diversity of dwelling units. Nonetheless, unlike smart growth, promoters of new urbanism are more concerned with the physical form, putting forward those changes in the physical arrangement are a precursor for town economic, social and environmental change. Moreover, the promoters of new urbanism have the belief that market forces will promote urban development without having to put in place regulatory measures (Iravani & Rao, 2020).

### **2.13 Conceptual Framework**

In the conceptual framework, the socio-economic attributes, housing attributes and residential planning standards on the left side of the conceptual framework form the independent variables that impact on the dependent variable (residential satisfaction) on the right side of the conceptual framework as explained in the theoretical framework. The variables of study identified through literature review under socio-economic attributes are the household socio-economic attributes that is age, income, household size, employment status, marital status, house expenses, house tenure, education level and duration of residence. For housing attributes, the variables of study identified through literature review are divided into two major categories that is dwelling unit features and neighbourhood features. Dwelling unit features were number of rooms, rent and mortgage cost, transport costs, housing ventilation, housing natural lighting and environmental aesthetics. Under neighbourhood features these included; access to schools (both primary and secondary), access to work, access to retail shopping centres,

access to public transport, access to recreational facilities, public security, neighbourhood hygiene, access to healthcare facility and access to public facilities. Even so, the quality of residential housing environment which reflects on residential satisfaction is checked by residential planning standards. As such, the conceptual framework links all these features to planning standards as explained in section 2.10; the nexus between urban housing planning standards and housing satisfaction and section. The planning standards assessed for the purpose of this study include plot size, plot coverage, building lines, setbacks, plot ratio, number of dwelling units per plot and access road width. Figure 2.2 is a conceptual framework.



**Figure 2.2: Conceptual Framework**

(Source: Author, 2020)

## CHAPTER THREE

### MATERIALS AND METHODS

#### 3.1 Introduction

This Chapter presents the study area, processes and approaches engaged in data collection, analysis and presentation. It also outlines the tools used in the data collection and sample size determination.

#### 3.2 Study Area Description

This study was in Eldoret Municipality, located in Uasin Gishu County in the former Rift valley province approximately 320.8 Km North West of Nairobi via road A104, Kenya. The town has various residential neighbourhoods comprising low, medium and high-density settlements. It is home to 475,716 people and a centre for agriculture and trade making it the fifth largest urban centre in the country after Nairobi, Mombasa, Kisumu and Nakuru in terms of urban population (KNBS, 2019). Figure 3.1 presents the geographical position of the study area.

##### 3.2.1 Physiography

Eldoret Municipality lies in a highland plateau traversed by Latitude  $0^{\circ} 31'$  North and Longitude  $35^{\circ} 16'$  East, approximately 2,085m above sea level. The Municipality area ascends from River Sosiani valley at about 1800 metres to 2200 metres creating a steep descend. The plateau terrain in the study area allows for easier construction of infrastructure such as roads and deployment of modern farming machinery in agricultural fields. The study area is within Lake Victoria catchment zone where the major river in the study area is R. Sosiani (Uasin Gishu CIDP 2018 -2022)

##### 3.2.2 Climatic Condition

Due to high altitude in the study area, temperature are fairly low with moderate humidity. The area experiences a high and reliable rainfall with an annual average

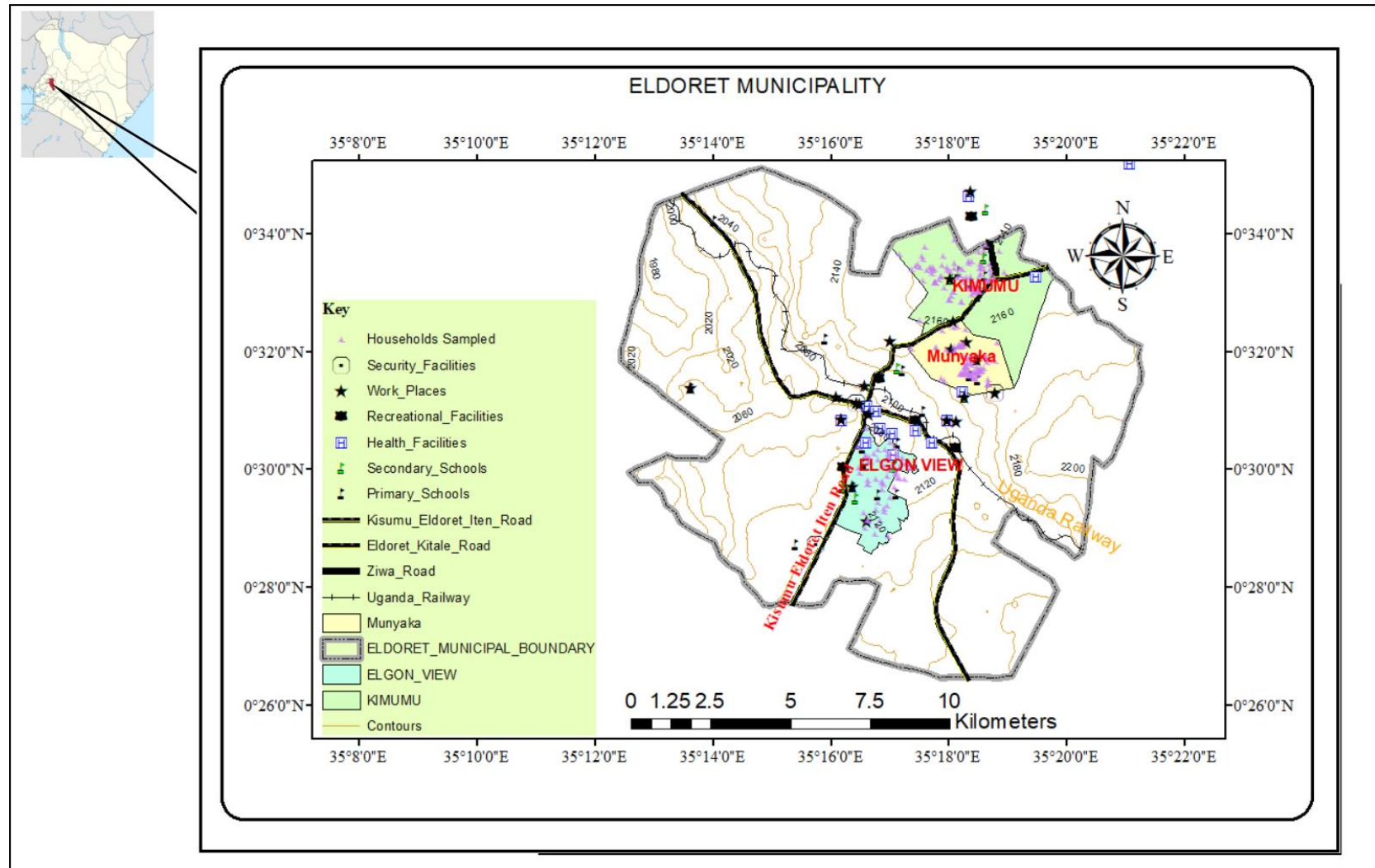
rainfall ranging between 624.9mm to 1560.4mm. Most of the rains occurs between the months of March and September with two distinct peaks in May and August. The dry seasons starts in the months of November and end in the months of February. The average temperatures range between 7<sup>0</sup>C and 29<sup>0</sup>C. The temperature and rainfall in the study area are conducive for both crop farming and livestock keeping (Uasin Gishu CIDP 2018 -2022).

### **3.2.3 Geology, Soils and Ecology**

The geology of the study area is dominated by tertiary volcanic rock with no known commercially exploitable minerals. There are four major soil types in the study area; red loam, red clay, brown loam and brown clay soils. The soils are good maize, sunflower, cattle farming, wheat, forestry, pyrethrum, potato and barley farming (Uasin Gishu CIDP 2018 -2022).

### **3.2.4 Infrastructures and Transport**

The study area has extensive infrastructure comprising of bitumen surface roads, gravel roads and earth surface roads. There is also the Eldoret International Airport and an Airstrip in the study area. The study area has also a railway line. Major roads Major roads traversing the County include; A8 (Timboroa – Kipkaren); C51 (Eldoret – Iten), C 54 (Eldoret – Kaptagat), C39 (Eldoret – Kapsabet), B2 (Eldoret – Kitale), D328 (Eldoret – Ziwa – Kitale), which link Uasin Gishu county with the neighboring counties of Elgeyo Marakwet, Nandi and Trans Nzoia. There are four main bus parks in Eldoret in the study area namely; Sosiani, Iten, Tagore and Main Bus Park and two main lorry parks at Maili Nne and Jua Kali. This makes the study area a regional transport and service hub.



**Figure 3.1 Study Area**

(Source: Author, 2020)

### **3.3 Nature, Types and Sources of Data**

To conduct and accomplish the study's objectives, the following data was sought for the four objectives of the research. The first objective was to assess levels of residential satisfaction across neighbourhoods in Eldoret Municipality. This study sought to acquire data on the residents' perceptions towards their residential environment. Specifically, this objective required the participants in the study to state their residential satisfaction on a Five-Level Likert scale representing perceptions on the degree to which the respondents were satisfied with their residential housing. The specific attributes of the residential environment with which respondents were asked to state their satisfaction levels were number of rooms (Number), neighbourhood hygiene, general cleanliness and environmental aesthetics (Likert scale as follows; 1- 'Not Satisfied', 2- 'Slightly Satisfied', 3- 'Moderately Satisfied', 4- 'Very Satisfied' and 5- 'Extremely Satisfied'), rent and mortgage expenses( Kenya shillings), transport cost (Kenya Shillings), public security (Likert scale as follows; 1- 'Not Satisfied', 2- 'Slightly Satisfied', 3- 'Moderately Satisfied', 4- 'Very Satisfied' and 5- 'Extremely Satisfied'), access to public facilities (metres), housing ventilation and natural lighting (Likert scale as follows; 1- 'Not Satisfied', 2- 'Slightly Satisfied', 3- 'Moderately Satisfied', 4- 'Very Satisfied' and 5- 'Extremely Satisfied'). The target population were the household heads.

The second objective was to determine the relationship between selected housing attributes and residential satisfaction, data required included data on the number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and mortgage expenses, expenditure on transport, housing unit GPS coordinates, distance to school, work, healthcare and public security ratings. This data was obtained from the household heads, sampled neighbourhoods and dwelling units in the study area.

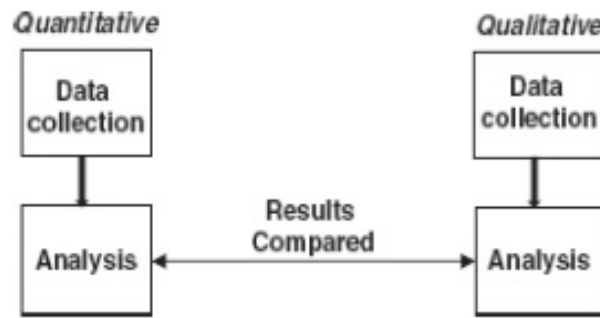
The third objective entailed determination of the relationship between selected household socio-economic attributes and residential satisfaction. To accomplish this, the study sought data including house tenure, education level, marital status, income, employment, household size and age. Household heads were the target respondents.

The fourth objective involved acquisition of data required to determine the extent of compliance to selected residential planning standards included data on plot size, plot coverage, building lines, setbacks, skyline, number of dwelling units per plot and access road width. This data was obtained from the household heads, sampled neighbourhoods and plots on which the dwelling units are developed. Data on residential planning standards were obtained from Uasin Gishu Department of Lands, Housing, Physical Planning and Urban Development.

### **3.4 Research Design**

The study employed a mixed-methods research design where a blend of quantitative and qualitative research methods was used to gather and analyse data. Mixed research design is a flexible methodology that allows comprehensive and synergistic use of data by combining both qualitative and quantitative data in the collection and analysis process (Creswell & Clark, 2017). The approach of data collection was concurrent triangulation. Concurrent triangulation is a strategy that puts equal emphasizes both to qualitative and quantitative components of a research design. It is suitable in the case of research questions aimed at getting information on a variable from multiple angles to eliminate biases. The qualitative data are obtained for whatever complimentary insights they can provide on the research question. Figure 3.2 illustrates the concurrent triangulation approach.





**Figure 3.2 Concurrent Triangulation Strategy**

(Source: Creswell & Clark, 2017)

Qualitative and quantitative data was collected during the initial stage, analysed and results compared to equally contribute to reaching the conclusion (Kanazawa, 2017).

### **3.5 Target Population**

The target population of the study consisted of the 475,716 residents of Eldoret Municipality across all residential neighbourhoods consisting of low, medium and high-density neighbourhoods. Such neighbourhoods and households therein made up the sampling frame for the study.

### **3.6 Sampling Design**

For the data to be representative of the various income groups, the study employed stratified, purposive and simple random sampling procedures.

#### **3.6.1 Stratified Sampling**

This study employed the neighbourhood strata namely low, medium and high-density neighbourhoods as per the Uasin Gishu County Land Use Regulation Framework 2014-2017 to sample the neighbourhoods. See appendix II for list of residential neighbourhoods in the study area.

#### **3.6.2 Purposive Sampling**

Purposive sampling method was used to select Elgon View (Block 13 and Block 14) neighbourhood as it is the only existing low-density neighbourhood in Eldoret

Municipality (*Uasin Gishu County Land Use Regulation Framework 2014-2017*). According to Nanda (2005), purposive sampling is considered more appropriate when the choice is limited that is one or two neighbourhoods only. In this sampling technique, the researcher uses his/her expert judgement and purpose to decide whom to include in his/her sampling frame.

### 3.6.3 Simple Random Sampling

Study sites in the medium and high-density neighbourhoods were selected using this technique. The lottery method involving probability sampling was used whereby a list of neighbourhoods in each stratum was made in a paper, separated and rolled into balls that were mixed well and put in a plate before picking them randomly. Under this sampling design, every item in space has an equal opportunity for inclusion in the sample. Kimumu for medium density and Munyaka for high density emerged as the selected study site. The list of residential neighbourhoods in the study area is attached. See appendix II.

### 3.7 Sample Size Determination

The sample size was determined the following Fischer (1991) method.

$$n = \frac{Z^2 p(1-p)}{D^2}$$

$$n = \frac{1.96^2 \times 0.24 \times 0.76}{0.05^2}$$

$$= 280.283136$$

$$= 280$$

Where,

$n$  = Sample size for target population

$Z$  = The Confidence Interval Value (1.96 for 95% Confidence Interval)

*P = The Estimate Proportion of Population*

*D = The Margin of Error*

The target respondents were selected according to the strata that are low-density medium-density and high-density residential neighbourhoods. In each stratum, the first respondent was identified randomly, after which the subsequent respondents were picked at an interval of seven households apart. According to the formula, a sample of 280 was to be used, however, due to non-response in some instances a sample of 246 was used. The respondents were selected in a systematic random manner where a household was selected at an interval of seven households apart. The interval of seven households apart was picked randomly, thereafter, systematically the rest of samples selected. In random sampling all the subjects have an equal chance of inclusion in the sample thus eliminating bias. The samples were collected along a transect in the three neighbourhoods that is Elgon View, Kimumu and Munyaka. Geographically, Kimumu being the largest, followed by Munyaka and the least being Elgon View, the transect in Kimumu was the longest leading to a sample size of 109, followed by Munyaka the second longest with a sample of 80 and Elgon View with the shortest transect leading to a sample size of 57.

### **3.7.1 Respondent Sampling procedure**

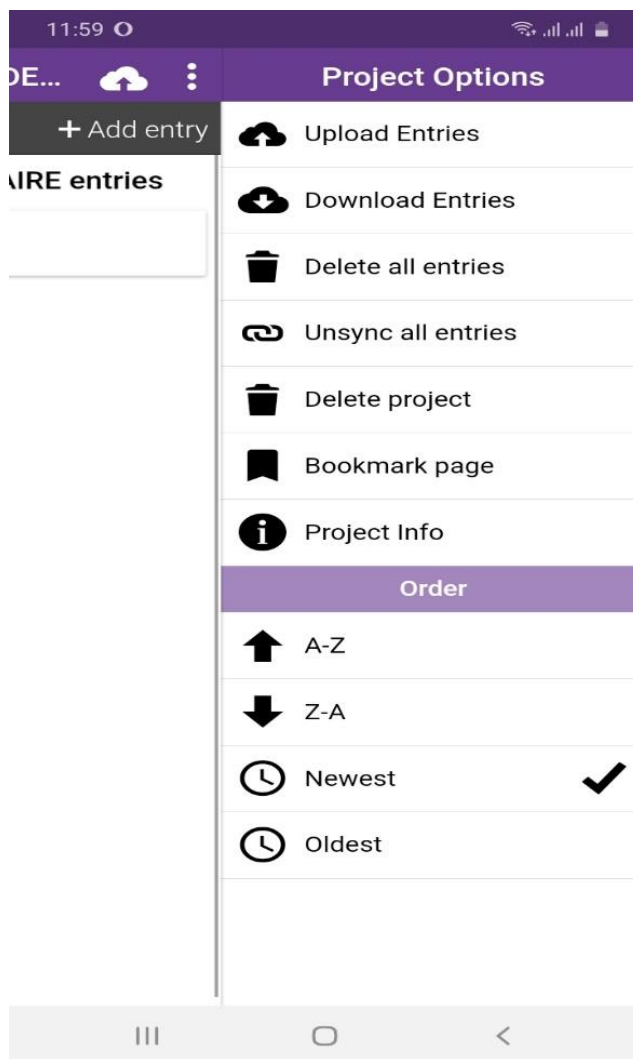
Upon completion of study sites selection and determination of the sample size, the target respondents were selected according to the strata that are low density, medium density and high-density residential neighbourhoods. In each stratum, the first respondent was identified randomly, after which the subsequent respondents were picked at an interval of seven households apart.

### **3.8 Data Collection Techniques and Tools**

Data on the study was collected from 16th January 2020 to 23rd January 2020. Various data collection techniques and tools were employed to collect data to meet the objectives as described in the next section.

#### **3.8.1 Survey Technique**

Survey Technique is a set of answer options either numeric or verbal that covers a range of opinions on a topic. The questions in a survey are either open ended or closed ended questions. Closed ended questions present the respondent with pre-populated answers choices while open ended questions do not provide options to the respondent. Survey technique was employed to acquire data on the levels of residential satisfaction, residential housing attributes and socioeconomic characteristics of study and compliance to selected residential planning standards. A questionnaire administered through Epicollect 5; a generic free source mobile phone data collection tool and associated web application that provides two-way communication between multiple data collectors and project database, was used as shown in Figure 3.3.



**Figure 3.3 Epicollect 5 Interface**

(Source: Author, 2020)

### **i) Likert Scale Survey Questions**

Developed back in 1932 by Rensis Likert, Likert survey questions is a tool used to quantify attitudes. A typical Likert scale is a five (5) or seven (7) point ordinal scale employed by respondents to measure the extent to which they agree or disagree with a statement (Sullivan & Artino Jr, 2013). In addition to measuring the extent of agreement to given statements, Likert scales can measure other attributes such as frequency of quality, likelihood, importance among others. A Likert scale is made up of four or more questions measuring a single trait where response scores are combined to get a more

accurate measure of the liberal or conservative opinions. Each question might be used to quantify a unique component of the overall topic (McLeod, 2019). Unlike simple yes or no answer, Likert scales allows for degrees of opinion and include a mid-point for example 'neither agree nor disagree' for those who are neutral on the subject matter. As such quantitative data is obtained leading to ease in data analysis (Rickards et al., 2012). Likert scales enables one to uncover degrees of opinions that could make real differences in comprehending the feedback received. Further, it can enable one to identify the areas that need improvement in terms of service or product offered.

There are two ways of formulating Likert scale questions that is unipolar and bipolar. On a Unipolar scale only one attribute is measured that is 'satisfaction' in the case of this study. In a bipolar scale, you measure two attributes for example satisfaction or dissatisfaction (Chyung et al., 2017). Nonetheless, for finer grained details about one attribute, a unipolar scale is recommended. A bipolar scale is only recommended in the case where the researcher wants to allow for a broader response (Croasmun & Ostrom, 2011). Unipolar scales are easier for respondents to think about, and both the researcher and the respondent can be certain that one end is the exact opposite of the other, making it methodologically more sound as well. It is further recommended to keep Likert scales odd to ensure there's a midpoint value (Sullivan & Artino Jr, 2013). Even so, giving respondents Likert scales with more than seven choices poses the risk of random selection of scores by the respondents making data obsolete. Practically, it is recommended for one to use a five scale points for a unipolar scale, and a seven-scale point for a bipolar scale (McLeod, 2019).

Considering that the data sought for this study was unipolar and the cons of using a bipolar scale, this study employed the use of a 5-point Likert scale to assess the levels of residential satisfaction. Respondents were asked questions to gauge their satisfaction

levels with the number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and mortgage expenses, expenditure on transport and public security components of their residential environment on a five-point Likert scale. The satisfaction levels were quantified as follows; 1- 'Not Satisfied', 2- 'Slightly Satisfied', 3- 'Moderately Satisfied', 4- 'Very Satisfied' and 5- 'Extremely Satisfied'. See table 3.1.

The kind of questions in the questionnaire used to assess satisfaction were Likert questions. Likert questions are used to measure attitudes and opinions with greater degree of nuance than simple 'yes/no' questions. The questions enable the researcher uncover degrees of opinions that helped understand the feedback of whether residential environments were just 'good enough' or hopefully 'excellent. The series of questions in the survey were focused around residential satisfaction. See appendix I for questionnaire used in the field study

### ii) Survey with Open and Closed Ended Questions

This tool was used to collect data on housing attributes and socio-economic. Socioeconomic data obtained by this method was house tenure, education level, marital status, income, employment, household size and age while housing attributes data include number of rooms that is living area and bedrooms. See Table 3.1

**Table 3.1 Data Sought by Survey Technique**

<b>No.</b>	<b>Data Variable</b>	<b>Measure</b>	<b>Tool</b>	<b>Respondent</b>
1.	a) Residential Satisfaction levels (the number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and mortgage	Likert Scale: 1- 'Not Satisfied', 2- 'Slightly Satisfied', 3- 'Moderately Satisfied', 4- 'Very Satisfied' and 5- 'Extremely Satisfied'	Questionnaire	Household head

	expenses, transport cost, public security, access to public facilities, housing ventilation and natural lighting)				
2.	Number of rooms	Bedrooms and living area	Questionnaire	Household head	
3.	House Tenure	Owner/ Renter	Questionnaire	Household head	
4.	Education level	None, Primary, Secondary and Tertiary	Questionnaire	Household head	
5.	Marital Status	Married/ Single	Questionnaire	Household head	
6.	Income	Ranges of Kshs. 10,000 from Kshs. 0 to Above Kshs. 100	Questionnaire	Household head	
7.	Employment	Employed/ Not Employed	Questionnaire	Household head	
8.	Household Size	Individual members in the household	Questionnaire	Household head	
9.	Age	Years (Household head)	Questionnaire	Household head	

### 3.8.2 Mapping Methods

Mapping method was employed to collect data on the neighbourhood components of the residential environment. Coordinates of the sampled housing units were taken using a GPS. Distance to various functional areas from the sampled housing unit that is the distance to school, work and health care were determined using google maps. To measure the distance to various functional areas, GPS coordinates of the household were obtained using GPS then using google map distances estimated. ArcGIS was used to draw the study area and map the sampled households. Table 3.2 shows data sought by the mapping technique.



**Table 3.2 Data Sought by Mapping Technique**

No.	Data Variable	Measure	Tool
1.	Coordinates of sampled housing units	Northings Eastings	and GPS ArcGIS
2.	a) Distance to School (Primary & Secondary) b) Distance to work c) Distance to health care facility	Metres (m)	Google Maps

### 3.8.3 Measurement Techniques

Measurement techniques were used to acquire data on the compliance to planning standards. Data on building lines (Front, rear and size), plot coverage and access road width were determined using a tape measure. Table 3.3 shows data acquired by measurement technique.

**Table 3.3 Data Sought by Measurement Technique**

No.	Data Variable	Measure	Tool
1.	Building lines (Front, Rear & Side)	Distance (Metres)	Tape Measure
2.	Access road width	Distance (Metres)	Tape Measure
3.	Plot Coverage	Percentage	Tape measure

Observation technique was used to acquire data on the number of dwelling units per plot and skyline. An observation checklist was the tool employed where the number of dwelling units on the plot and number of floors the dwelling unit on the plot has were counted and recorded. See appendix III for the attached observation checklist.

## 3.9 Data Management and Analysis

This section presents the analysis procedures used to analysis data for the separate objectives of the study.

### 3.9.1 Objective One: To assess level of residential satisfaction across neighbourhoods

Data from the Likert scale was collected using individual Likert-type questions that is Likert scale score measuring satisfaction level with the number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and

mortgage expenses, ventilation, access to public infrastructure, natural lighting, expenditure on transport and public security. As such the data was ordinal thus calling for ordinal analysis procedures. In ordinal scale, each item has a rank that is higher or lower than others, nonetheless the exact differences between the items are not clearly defined. To assess level of residential satisfaction across neighbourhoods that is Elgon View, Kimumu and Munyaka that is low, medium and high-density neighbourhoods respectively, the following analyses were conducted:

i) **Descriptive Statistics**

Descriptive statistics were conducted to summarize the data in simple numerical and visual form. The Likert questions were individually analysed to get insights into the specific attributes. The findings were presented using tables and figures. To the overall impression of the sample, statistical analysis mode for each question were conducted. Bar charts for each question were also created to visualize the Likert score frequency for each housing attribute.

**3.9.2 Objective Two and Three: To determine the relationship between selected housing attributes, selected socioeconomic characteristics and residential satisfaction**

To determine the relationship between selected housing attributes, selected socioeconomic characteristics and residential satisfaction that is objective two and three, the following analyses were conducted:

i) **Regression Analysis – Ordered Logistic Regression (OLR)**

Ordered Logistic regression also referred to as the logit model or cumulative link model is a kind of regression where the dependent variables are ordinal and ordered with more than two categories or levels (Stephanie, 2014). In this study these were the residential satisfaction levels measured on a five-point Likert scale that is 1- 'Not Satisfied', 2-

‘Slightly Satisfied’, 3- ‘Moderately Satisfied’, 4- ‘Very Satisfied’, 5- ‘Extremely Satisfied’. Unlike the conventional regression that uses the R and R<sup>2</sup> values, ordered logistic regression assigns probabilities (log odds) that values will lie below a certain threshold (Menard, 2002). In OLR, regression coefficients show the predicted change in log odds of being in a higher rank of residential satisfaction as opposed to a lower rank on the dependent variable per unit increase on the independent variable. A positive estimate indicates a certain amount of increase in the log odds of falling at a higher level of residential satisfaction as dependent variable, per unit increase in the independent variable. That is, as scores rise on an independent variable, there is an increased likelihood of falling at a higher level on the dependent variable. A negative estimate indicates a certain amount of decrease in the log odds of falling at a higher level of residential satisfaction dependent variable per unit increase in the independent variable. That is, as scores increase in on an independent variable, there is a decreased probability of falling at a higher level on the dependent variable.

The Goodness of fit tests that is Pearson Chi-square tests and Deviance were done to determine whether the Ordered Logistic Regression model was a good fit to the data. Non-significant test results are a show of good model fit (Field, 2018). The Proportions Odds Assumptions were also conducted. The Proportional Odds Assumption states that the relationship between the independent variable and the dependent variable is constant, irrespective of which groups are being compared on the dependent variable. A non-significant value is an evidence that the assumption is met (Parkes, 2016).

In this study, residential satisfaction was an ordinal variable with five categories: 1- ‘Not Satisfied’, 2- ‘Slightly Satisfied’, 3- ‘Moderately Satisfied’, 4- ‘Very Satisfied’, 5- ‘Extremely Satisfied’.

The regression model was conducted in a stepwise manner where the initial model had sixteen (16) independent variables that is neighbourhood hygiene, environmental aesthetics, distance to primary school, secondary school, workplace, healthcare facility, access to retail shopping centres, access to public transport, access to recreational facilities, neighbourhood hygiene, number of rooms, rent and mortgage expenses, public security, lighting, ventilation and expenditure on transport for objective 2. The proportional odds assumption was met with the final regression model having four (4) housing attributes (independent variables) that is neighbourhood hygiene, public security, number of rooms and environmental aesthetics that were significant housing attributes of residential satisfaction.

Similarly, for objective 3, Ordered Logistic regression was conducted in a stepwise fashion. The initial model had nine (9) independent variables that is age, household size, marital status, level of education, employment status, income, duration of residence, housing expenses and house tenure. The proportional odds assumption was met with the final regression model having seven (7) socioeconomic attributes (independent variables) that is age, household size, marital status, level of education, employment status, income and house tenure that were significant socioeconomic attributes of residential satisfaction.

Descriptive statistics were also conducted on dwelling unit, neighbourhood attributes, perceptions on the quality of services and sociodemographic characteristics and presented using tables and figures. GIS was used to conduct spatial analysis where a topographical map was prepared highlighting the distribution of various functional areas in the sampled neighbourhoods, sampled households, schools both primary and secondary and the location of the sampled neighbourhoods.

### 3.9.3 Objective Four: To determine the extent of compliance to selected residential planning standards

In determining the extent of compliance to residential planning standards data on access road width, plot coverage, plot size, skyline and the number of dwelling units per plot were analysed descriptively using means and standard deviations.

A matrix of compliance as shown in Table 3.4 was used to assess the level of compliance to residential planning standards.

**Table 3.4 Matrix of Compliance**

No	Attribute	Planning Standard	Findings	Compliance (Yes/No)
1.	Access road width	9m		
2.	Plot Coverage	Low Density Residential	50%	
		Medium Density Residential	65%	
		High Density Residential	70%	
3.	Building Line	Front	2.5 m	
		Rear	3 m	
		Side	1.5m	
4.	Plot size	Low Density Residential	0.2ha	
		Medium Density Residential	0.2ha	
		High Density Residential	0.045ha	
5.	Number of Dwelling units per Plot	Low Density Residential	50	
		Medium Density Residential	65	
		High Density Residential	70	

**(Source: Physical Planning Handbook 2007)**

An analysis of Variance – one-way ANOVA was also conducted to check the variability between access road width in residential low density Elgon View, Medium density Kimumu and residential high density Munyaka neighbourhoods in the study area. Levene tests of homogeneity of variance, Brown Forsythe robust test for equality of mean and the Post Hoc test Tukey HSD were also conducted to further illustrate the difference in the mean access road width within the neighbourhoods.

## CHAPTER FOUR

### RESULTS

#### 4.1 Overview

This Chapter presents the results from the analysis of data collected in the field. The results presentation is organized in the order of this study's objectives. The findings are presented using descriptive and inferential statistics.

#### 4.2 Levels of Residential Satisfaction

The first objective of the study, to determine levels of residential satisfaction across neighbourhoods in Eldoret Municipality. Residential satisfaction levels were measured on the basis of various residential housing components that is number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and mortgage expenses, ventilation, Natural lighting, expenditure on transport, access to public facilities and public security across the three neighbourhoods under study.

Table 4.1 is a presentation on the study findings on overall residential satisfaction level in the study area. The findings are summarized in percentage across the five Likert scale satisfaction levels.

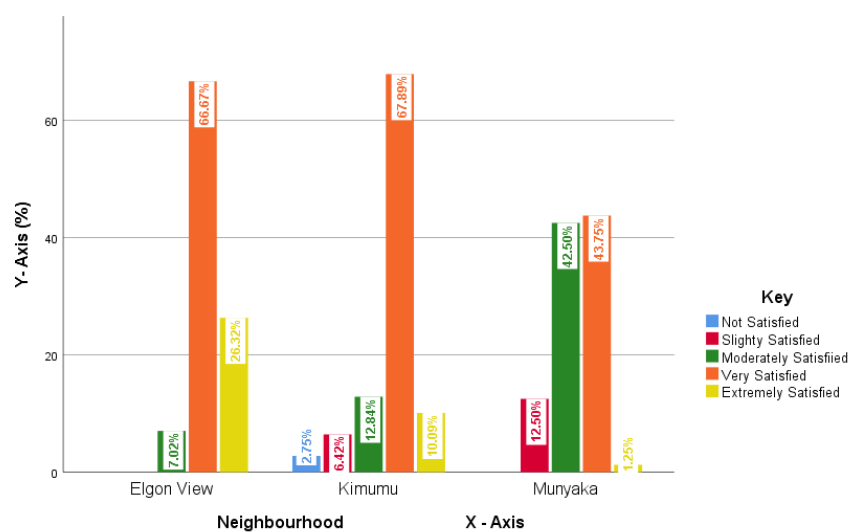
**Table 4.1 Overall Residential Satisfaction Level in the Study Area**

<b>Likert Scale Satisfaction Levels</b>	<b>Percent (%)</b>
Not Satisfied	1.2
Slightly Satisfied	6.9
Moderately Satisfied	21.1
Very Satisfied	59.8
Extremely Satisfied	11.0
<b>Total</b>	<b>100.0</b>

From the findings more than half of the respondents showed an above midpoint level of residential satisfaction. 59.8% of the respondents had 'very Satisfied' while 11% of the respondents exhibited an 'extremely satisfied' level residential satisfaction. 21.1% of

the respondents exhibited an average level of satisfaction that is ‘moderately satisfied’. Only 6.9% ‘slightly satisfied’ and 1.2% ‘not satisfied’ of the respondents exhibited a below average level of residential satisfaction.

Figure 4.1 presents residential satisfaction levels as per the neighbourhoods of study. Elgon View neighbourhood exhibited the highest levels of satisfaction with majority of the respondents in the ‘very satisfied’ 66.67%, ‘extremely satisfied’ 26.32%, and ‘moderately satisfied’ 7.02%. This neighbourhood had no respondents in ‘slightly satisfied’ and ‘not satisfied’ categories. Kimumu neighbourhood followed Elgon View neighbourhood in terms of satisfaction with majority of the respondents in the ‘very satisfied’ 67.89%, ‘moderately satisfied’ 12.84% and ‘extremely satisfied’ 10.09% categories. Further, Kimumu neighbourhood had 6.42% in ‘slightly satisfied’ and 2.75% ‘not satisfied’ categories. Among the three neighbourhoods, Munyaka had the least residential housing satisfaction levels where it recorded the least percentage that is 1.25% in the ‘extremely satisfied category. The other three satisfaction categories in Munyaka were ‘very satisfied’ 43.75%, ‘moderately satisfied’ 42.50% and ‘slightly satisfied’ 12.50%. Munyaka had zero respondents in the ‘not satisfied’ category.



**Figure 4.1 Residential Satisfaction Levels Across Neighbourhoods**

### 4.3 Satisfaction with Housing Attributes

This section presents results on the satisfaction with the fundamental housing attributes measured by individual Likert questions.

#### i) Satisfaction with Number of Rooms

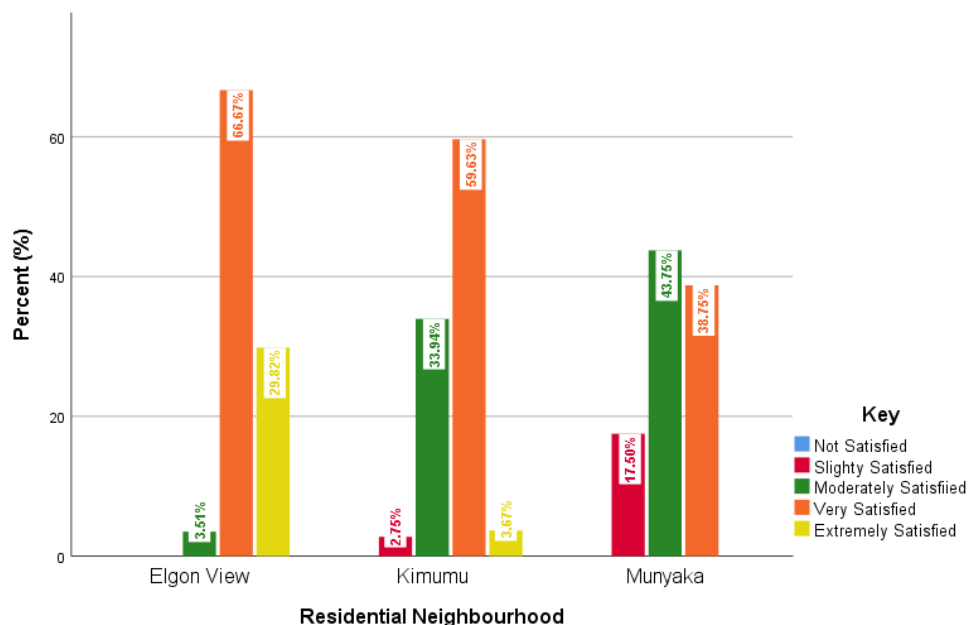
Table 4.2 presents a summary of findings on the satisfaction with number of rooms in the study area. Most of majority of the respondents 54.5% expressed ‘very satisfied’ level of satisfaction. 30.1% ‘moderately satisfied’, 8.5% ‘extremely satisfied’, 6.9% ‘slightly satisfied’ and 0% ‘not satisfied’.

**Table 4.2 Satisfaction with Number of Rooms**

<b>Likert Score</b>	<b>Percent (%)</b>
Not Satisfied	0
Slightly Satisfied	6.9
Moderately Satisfied	30.1
Very Satisfied	54.5
Extremely Satisfied	8.5
Total	100.0

Figure 4.2 illustrates the study findings on the satisfaction with number of rooms housing attribute across the three neighbourhoods. Elgon View neighbourhood respondents demonstrated the highest level of satisfaction with the number of rooms with most of the respondents with an above average level of residential satisfaction. The neighbourhood had 66.7% ‘very satisfied’, 29.82% ‘extremely satisfied’ and 3.51% moderately satisfied. Elgon View neighbourhood had zero respondents in the ‘slightly satisfied’ and ‘not satisfied’ categories. Kimumu neighbourhood had a similarly higher level of satisfaction with the number of rooms with most of the respondents exhibit an above average satisfaction level. The neighbourhood had 59.63% ‘very satisfied’, 33.94% ‘Moderately satisfied’ and 3.67% ‘extremely satisfied’. In Kimumu only 2.75% of respondents exhibited a below average ‘slightly satisfied’ level of satisfaction with number of rooms. Munyaka neighbourhood had 43.75%, 38.75% and 17.5% respondents in the ‘moderately satisfied’, ‘very satisfied’, and slightly satisfied categories respectively. The neighbourhood had zero respondents in the ‘extremely satisfied’ and ‘not satisfied’ categories.





**Figure 4.2 Satisfaction with Number of Rooms Across Residential Neighbourhoods**

## ii) Satisfaction with Neighbourhood Hygiene

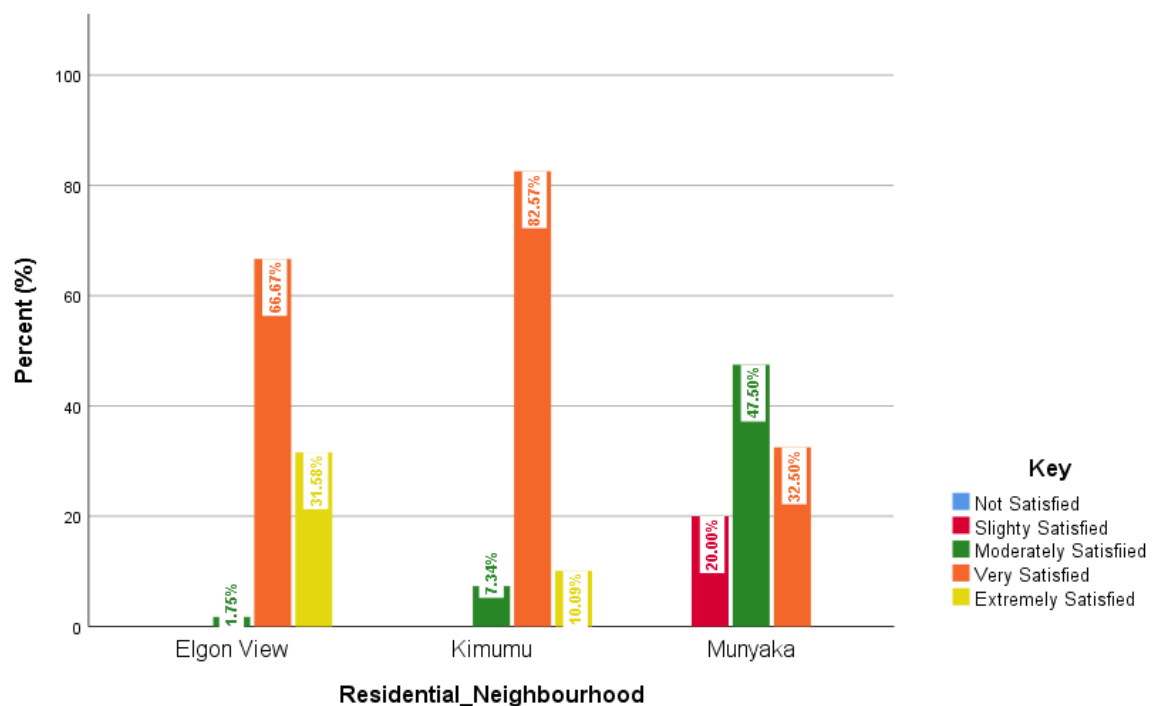
Table 4.3 presents a summary of the study finding on satisfaction levels with neighbourhood hygiene component of residential housing environment. 62.6% had ‘very satisfied’, 19.1% ‘moderately satisfied’, 11.8% ‘extremely satisfied’, 6.5% ‘slightly satisfied’ and 0% ‘not satisfied’ levels of residential satisfaction.

**Table 4.3 Satisfaction with Neighbourhood Hygiene**

Likert Score	Percent (%)
Not Satisfied	0
Slightly Satisfied	6.5
Moderately Satisfied	19.1
Very Satisfied	62.6
Extremely Satisfied	11.8
Total	100.0

Figure 4.3 presents findings on the satisfaction with neighbourhood hygiene in the study area. In Elgon View neighbourhoods most of the satisfaction levels were in ‘very satisfied’ 66.67% and ‘extremely satisfied’ 31.58% categories, with ‘moderately satisfied’ category having 1.75%. ‘Slightly satisfied’ and ‘not satisfied’ categories had

zero respondents in Elgon View. In Kimumu, most respondents 82.57% were in ‘very satisfied’ category, ‘extremely satisfied’ and ‘moderately satisfied’ had 10.09% and 7.34% respectively. Similarly, in Kimumu ‘slightly satisfied’ and ‘not satisfied’ had zero respondents. Munyaka neighbourhood had most of the respondents 47.50% in ‘moderately satisfied’ category. ‘Very satisfied’ and ‘slightly satisfied’ had 32.5% and 20% respondents respectively. There were no respondents in the ‘extremely satisfied’ and ‘not satisfied’ categories in Munyaka neighbourhood.



**Figure 4.3 Satisfaction with Neighbourhood Hygiene**

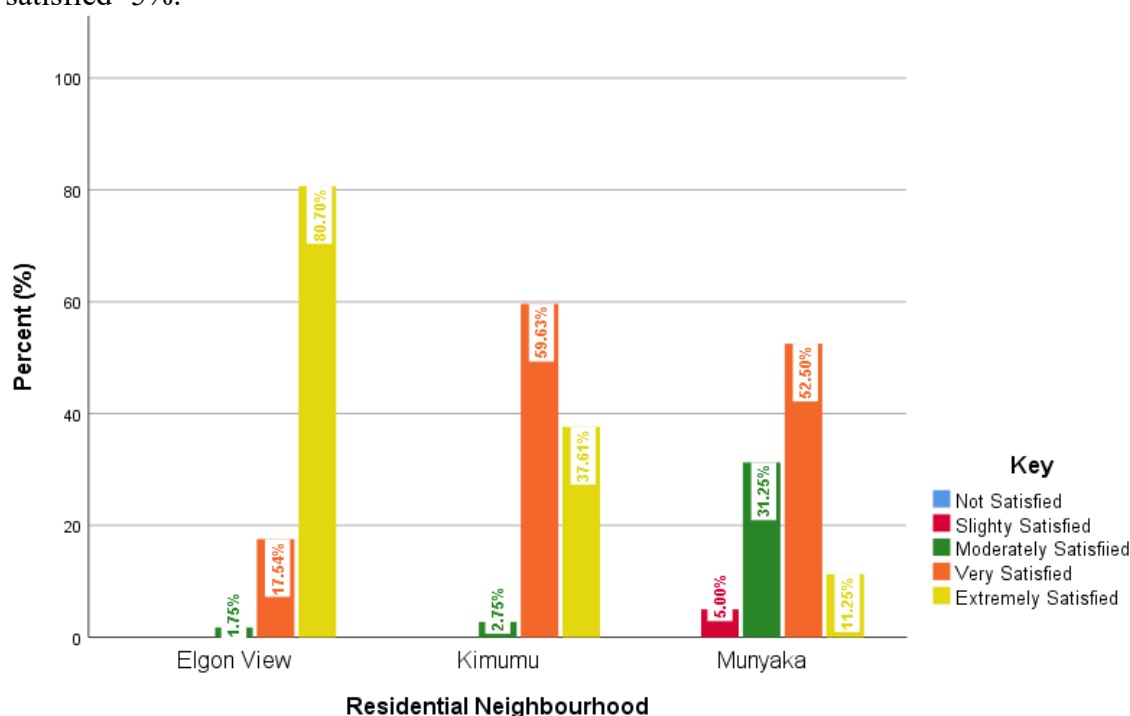
### iii) Satisfaction with General Cleanliness and Environmental Aesthetics

Table 4.4 presents a summary of study findings on satisfaction with general cleanliness and environmental aesthetics. Majority of the respondents 47.6 had ‘very satisfied’ level of residential satisfaction. This was followed by ‘extremely satisfied 39%, ‘moderately satisfied 11.8%, ‘slightly satisfied 1.6% and ‘not satisfied’ at 0%.

**Table 4.4 Satisfaction with General Cleanliness and Environmental Aesthetics**

Likert Score	Percent (%)
Not Satisfied	0
Slightly Satisfied	1.6
Moderately Satisfied	11.8
Very Satisfied	47.6
Extremely Satisfied	39.0
Total	100.0

Figure 4.4 presents findings on satisfaction with the general cleanliness and environmental aesthetics. Elgon View had the highest level of satisfaction with the general cleanliness and environmental aesthetics. 80.7% of the respondents in Elgon View neighbourhood recorded ‘extremely satisfied’ level of satisfaction with this housing attribute. ‘Very satisfied’ and ‘moderately satisfied’ had 17.54% and 1.75% respectively in the same neighbourhood. In Kimumu satisfaction with the general cleanliness and environmental aesthetics was ‘very satisfied’ 59.63%, ‘extremely satisfied’ 37.61% and ‘moderately satisfied’ 2.75%. Munyaka had ‘very satisfied’ 52.5%, ‘moderately satisfied’ 31.25%, ‘extremely satisfied’ 11.25% and ‘slightly satisfied’ 5%.

**Figure 4.4 Satisfaction with General Cleanliness and Environmental Aesthetics**

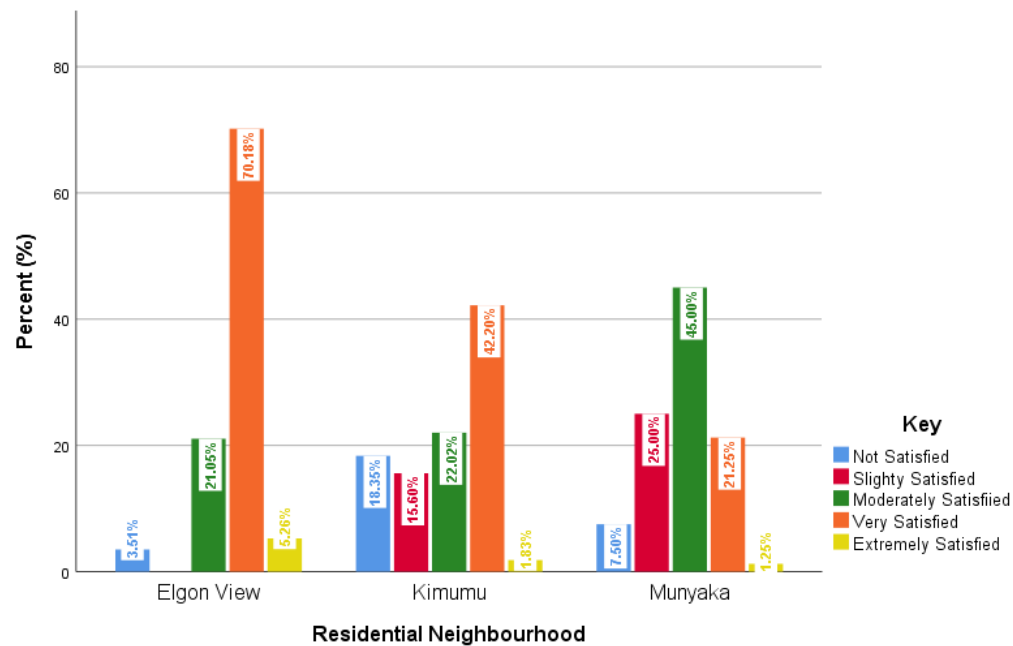
#### iv) Satisfaction with Rent and Mortgage Expenses

Table 4.5 presents a summary on the satisfaction with rent mortgage component of residential housing. The satisfaction levels with this component were as follows; 41.9% ‘very satisfied’, 29.3% ‘moderately satisfied’, 15% ‘slightly satisfied’, 11.4% ‘not satisfied’ and 2.4% ‘extremely satisfied’.

**Table 4.5 Satisfaction with Rent and Mortgage Expenses**

<b>Likert Score</b>	<b>Percent (%)</b>
Not Satisfied	11.4
Slightly Satisfied	15.0
Moderately Satisfied	29.3
Very Satisfied	41.9
Extremely Satisfied	2.4
Total	100.0

Figure 4.5 illustrates study findings on the satisfaction with housing rent and mortgage expenses. Satisfaction with rent and mortgage expenses in Elgon View neighbourhood was at 70.18% ‘very satisfied’, 21.05% ‘moderately satisfied’, 5.26% ‘extremely satisfied’, 3.51% ‘not satisfied’ and zero respondents in the slightly satisfied category. In Kimumu neighbourhood, most of the respondents 42.2% were in the ‘very satisfied’ level of residential satisfaction. The rest were 22.02% ‘moderately satisfied’, 18.35% ‘not satisfied’, 15.6% ‘slightly satisfied’ and 1.83% ‘extremely satisfied’. In Munyaka, 45% of respondents had ‘moderately satisfied’, 25% slightly satisfied, 21.25% ‘very satisfied’, 7.5% ‘not satisfied’ and 1.25% ‘extremely satisfied’.



**Figure 4.5 Satisfaction with Rent and Mortgage Expenses Across Neighbourhoods**

**v) Satisfaction with Housing Ventilation**

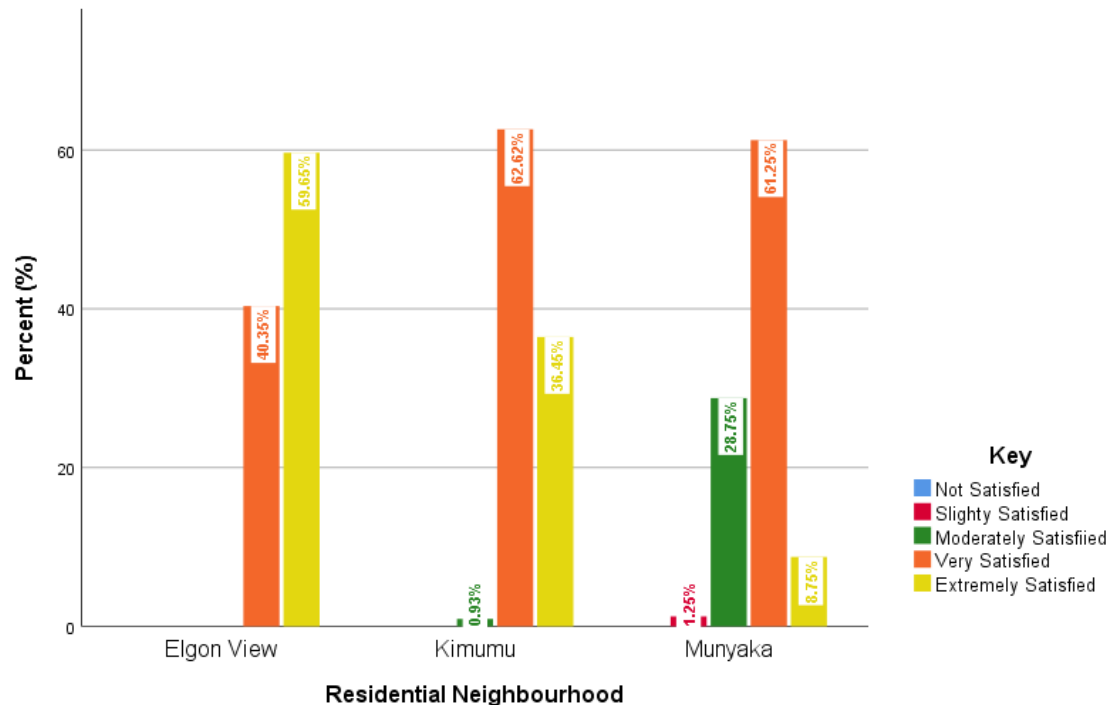
Table 4.6 presents a summary of satisfaction levels on housing satisfaction in the study area. ‘Very satisfied’ was the dominant satisfaction level recorded by 57% of the respondents, ‘extremely satisfied’ 32.8%, ‘moderately satisfied’ 9.8%, slightly satisfied 0.4% and ‘not satisfied’ 0%.

**Table 4.6 Satisfaction with Housing Ventilation**

Likert Score	Percent (%)
Not Satisfied	0
Slightly Satisfied	0.4
Moderately Satisfied	9.8
Very Satisfied	57.0
Extremely Satisfied	32.8
Total	100.0

Figure 4.6 presents study findings on the satisfaction with housing ventilation in the three neighbourhoods of study. For housing ventilation, Elgon View scored high on the Likert Scale with most of the respondents being in the ‘extremely satisfied’ 59.65% and ‘very satisfied’ 40.35%. Kimumu was also dominated by the two categories that is ‘very

satisfied' 62.62% and 'extremely satisfied' 36.45%. Kimumu had a small percentage 'moderately satisfied' 0.93%. Munyaka had 'very satisfied' 61.25%, 'moderately satisfied' 28.75%, 'extremely satisfied' 8.75% and 'slightly satisfied' 1.25%.



**Figure 4.6 Satisfaction with Housing Ventilation**

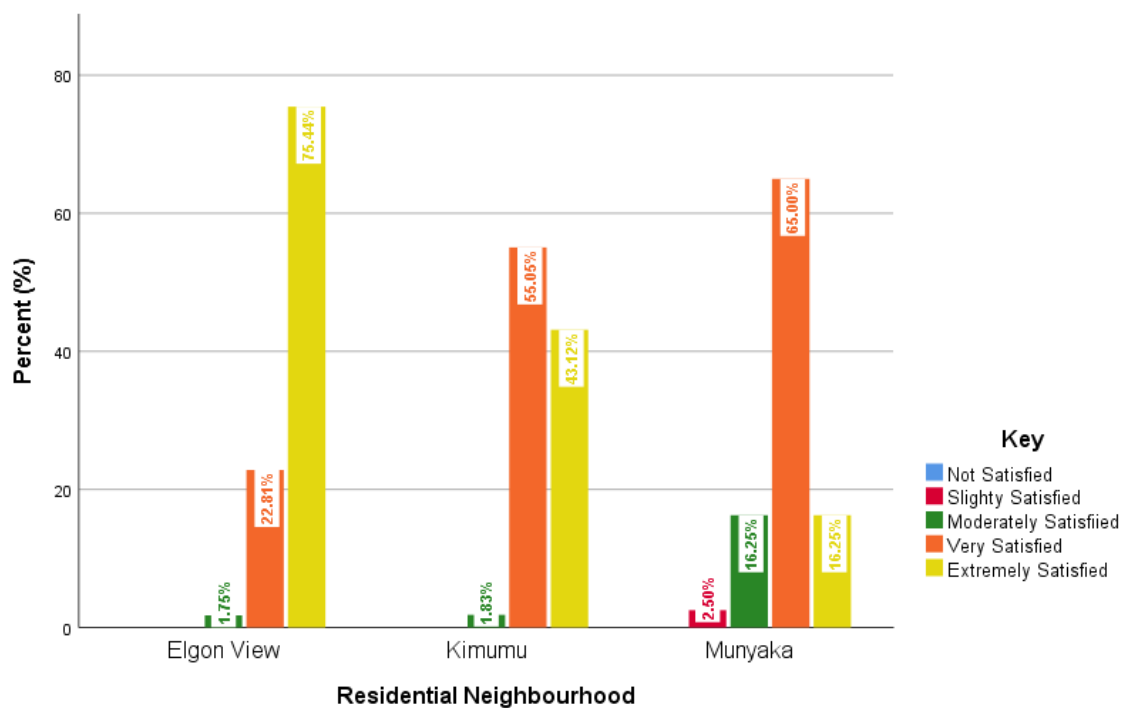
**vi) Satisfaction with Natural Lighting in the House**

Table 4.7 is a summary of findings on satisfaction on natural lighting in housing. The residential satisfaction levels were distributed as follows; 'very satisfied' 50.8%, 'extremely satisfied' 41.9%, 'moderately satisfied' 6.5%, 'slightly satisfied' 0.8% and 'not satisfied' 0%.

**Table 4.7 Satisfaction Natural Lighting in the House**

Likert Score	Percent (%)
Not Satisfied	0
Slightly Satisfied	0.8
Moderately Satisfied	6.5
Very Satisfied	50.8
Extremely Satisfied	41.9
Total	100.0

Figure 4.7 illustrates the satisfaction with natural lighting attribute of residential housing. Residents in Elgon View estate demonstrated a high satisfaction level with this component of the housing environment that is 75.44% ‘extremely satisfied’, 22.81% ‘very satisfied’, 1.75% ‘moderately satisfied’. This neighbourhood had zero respondents in the ‘slightly satisfied’ and ‘not satisfied’ levels of satisfaction. Kimumu neighbourhood had most of the respondents 55.05% in ‘very satisfied’, 43.12% ‘extremely satisfied’ and 1.83% ‘moderately satisfied’. Munyaka neighbourhood had 65% in ‘very satisfied’, 16.25% for ‘extremely satisfied’ and ‘moderately satisfied’ each, 2.50% ‘slightly satisfied’ and zero respondents in the ‘not satisfied’ level.



**Figure 4.7 Satisfaction with Natural Lighting**

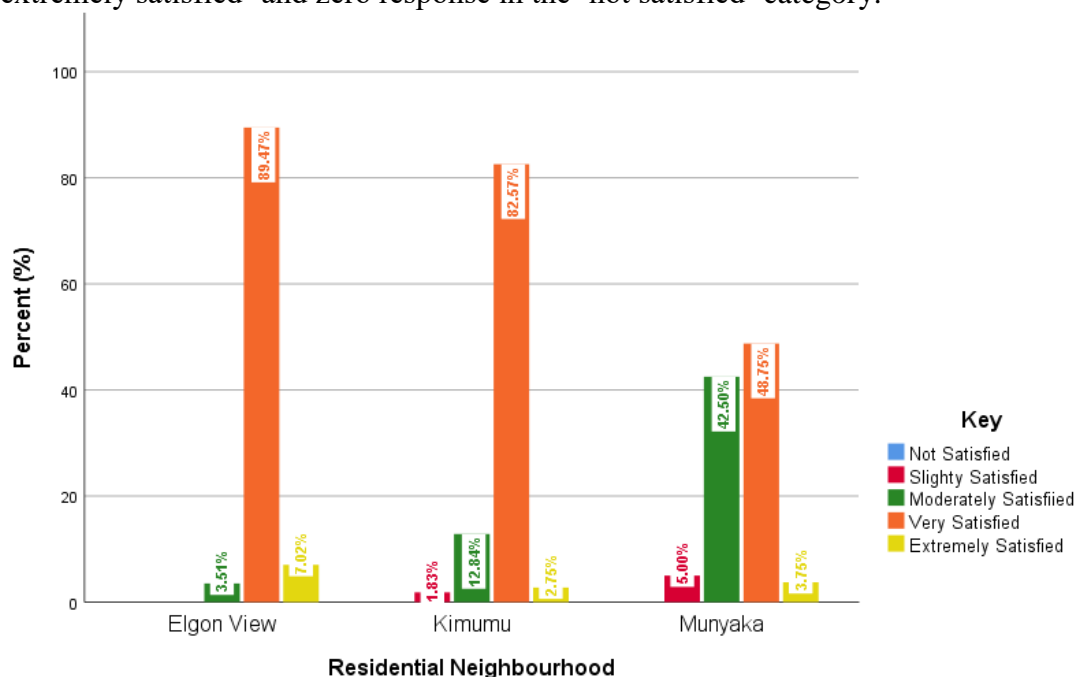
**vii) Satisfaction with Transportation Cost**

Table 4.8 presents a summary of study findings on the satisfaction with transportation cost in the study area. A majority of the respondents 73.2% expressed a ‘very satisfied’ level of residential satisfaction. 20.3% ‘moderately satisfied’, 4.1% ‘extremely satisfied’, 2.4% ‘slightly satisfied’ and 0% ‘not satisfied’.

**Table 4.8 Satisfaction with Transportation Cost**

Likert Score	Percent (%)
Not Satisfied	0
Slightly Satisfied	2.4
Moderately Satisfied	20.3
Very Satisfied	73.2
Extremely Satisfied	4.1
Total	100.0

Figure 4.8 illustrates the study findings on satisfaction levels on the transportation costs. Elgon View neighbourhood expressed the highest level of satisfaction with transport cost attribute of housing that is 89.47% 'very satisfied', 7.02% 'extremely satisfied', 3.51% 'moderately satisfied' and zero response in the 'slightly satisfied' and 'not satisfied' levels of residential satisfaction. Kimumu followed with relatively higher levels of residential satisfaction that is 82.57% 'very satisfied', 12.84% 'moderately satisfied', 2.75% 'extremely satisfied', 1.83% 'slightly satisfied' and zero response in 'not satisfied' level of satisfaction. Munyaka had the least level of satisfaction with transport cost among the three neighbourhoods. In Munyaka 'very satisfied' 48.75% and 'moderately satisfied' 42.50% were the highly recorded satisfaction levels. Other levels of satisfaction recorded in Munyaka were 5% 'slightly satisfied', 3.75% 'extremely satisfied' and zero response in the 'not satisfied' category.

**Figure 4.8 Satisfaction with Transportation Cost**



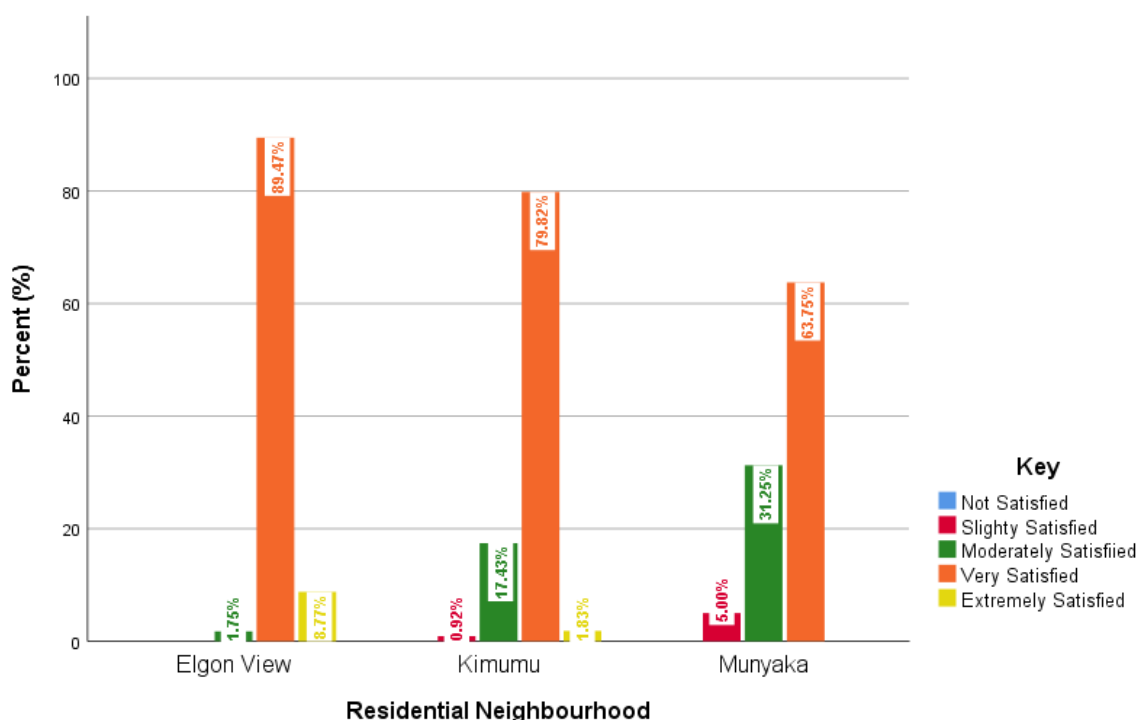
### viii) Satisfaction with Access to Public Facilities

Table 4.9 illustrates the study findings on satisfaction with public facilities as a component of the residential environment. 76.8% of the respondents had ‘very satisfied’ level of satisfaction, 18.3% ‘moderately satisfied’, 2.8% ‘extremely satisfied’, 2% ‘slightly satisfied’ and 0% ‘not satisfied’.

**Table 4.9 Satisfaction with Public Facilities**

<b>Likert Score</b>	<b>Percent (%)</b>
Not Satisfied	0
Slightly Satisfied	2.0
Moderately Satisfied	18.3
Very Satisfied	76.8
Extremely Satisfied	2.8
Total	100.0

Figure 4.9 illustrates study findings on the level of satisfaction with access to public facilities such as schools, hospitals and recreational facilities across the three neighbourhoods. Elgon View had the highest respondents 89.47% recording ‘very satisfied’ level of satisfaction, 8.77% ‘extremely satisfied’ and 1.75% ‘moderately satisfied’. There were zero responses in the ‘not satisfied’ and ‘slightly satisfied’ levels of satisfaction in the same neighbourhood. In Kimumu neighbourhood, the level of satisfaction with access to public facilities was 79.82% ‘very satisfied’, 17.43% ‘moderately satisfied’, 1.83% ‘extremely satisfied’, 0.92% ‘slightly satisfied’ and zero response for ‘not satisfied’. In Munyaka neighbourhood recorded levels of satisfaction with access to public facilities were 63.75% ‘very satisfied’, 31.25% ‘moderately satisfied’, 5% ‘slightly satisfied’ and zero response for ‘extremely satisfied’ and ‘not satisfied’ satisfaction levels.



**Figure 4.9 Satisfaction with Access to Public Facilities**

**ix) Satisfaction with Public Security**

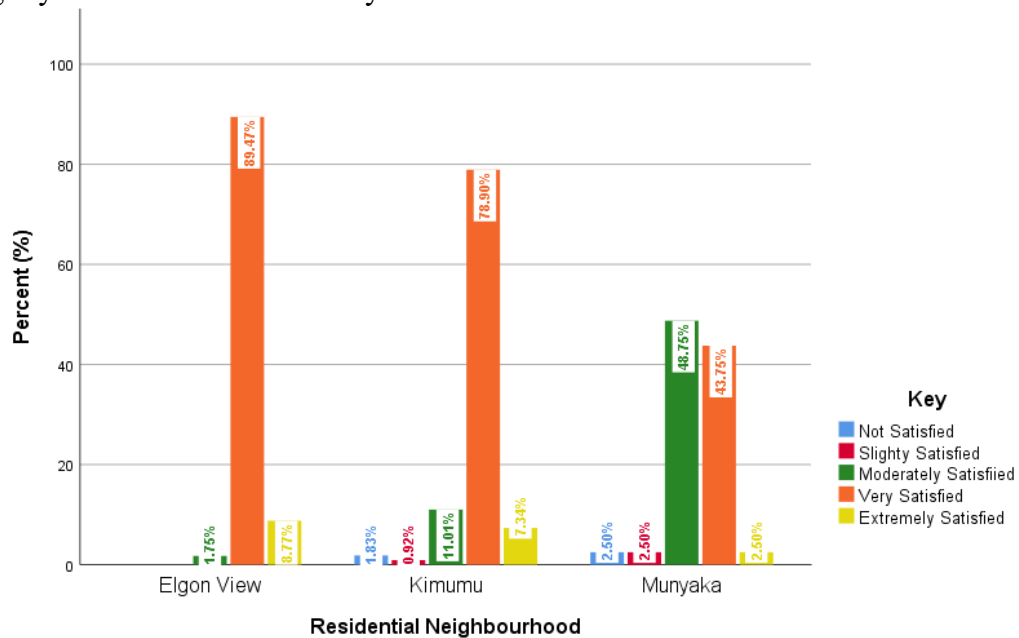
Table 4.10 is a summary of study finding on level of satisfaction with public security attribute of residential housing. There was majority of the respondents 69.9% expressing ‘very satisfied’ level of residential satisfaction. 21.1% had ‘moderately satisfied’, 6.1% ‘extremely satisfied’, 1.6% ‘not satisfied’ and 1.2% ‘slightly satisfied’.

**Table 4.10 Satisfaction with Public Security**

	Percent (%)
Not Satisfied	1.6
Slightly Satisfied	1.2
Moderately Satisfied	21.1
Very Satisfied	69.9
Extremely Satisfied	6.1
Total	100.0

Figure 4.10 illustrates the study findings on the satisfaction with public security attribute of residential housing environment. Most of the respondents in Elgon View neighbourhood expressed ‘very satisfied’ 89.47%, and ‘extremely satisfied’ 8.77% levels of satisfaction with the least being ‘moderately satisfied’ 1.75%. In this neighbourhood there were no response in the ‘slightly satisfied’ and ‘not satisfied’ categories. In Kimumu neighbourhood, satisfaction levels for access to public facilities was distributed as follows; ‘very satisfied’ 78.9%, ‘moderately satisfied’ 11.01%,

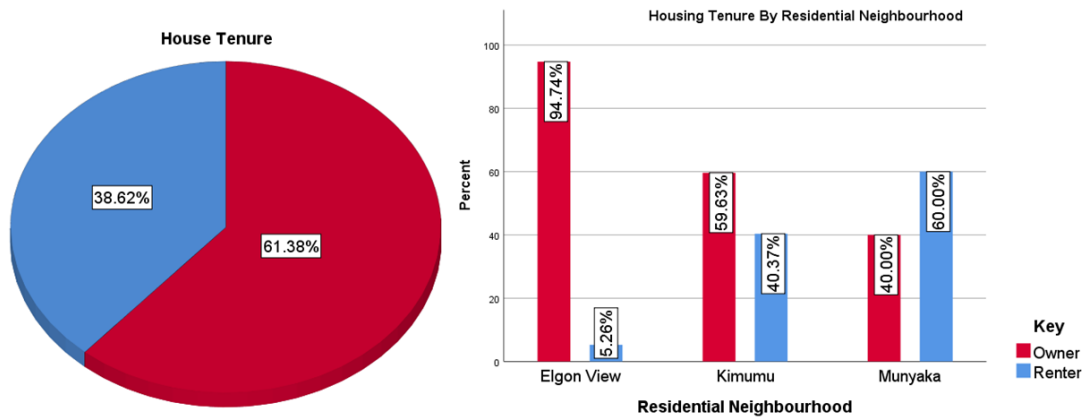
‘extremely satisfied’ 7.34%, ‘not satisfied’ and ‘slightly satisfied’ at 1.83% and 0.92% respectively. Munyaka neighbourhood had most of the respondents in the ‘moderately satisfied’ 48.75% and ‘very satisfied’ 43.75%. The other three levels of satisfaction with public security attribute recorded in Munyaka neighbourhood were ‘not satisfied’, ‘slightly satisfied’ and ‘extremely satisfied’ at 2.5% each.



**Figure 4.10 Satisfaction with Public Security**

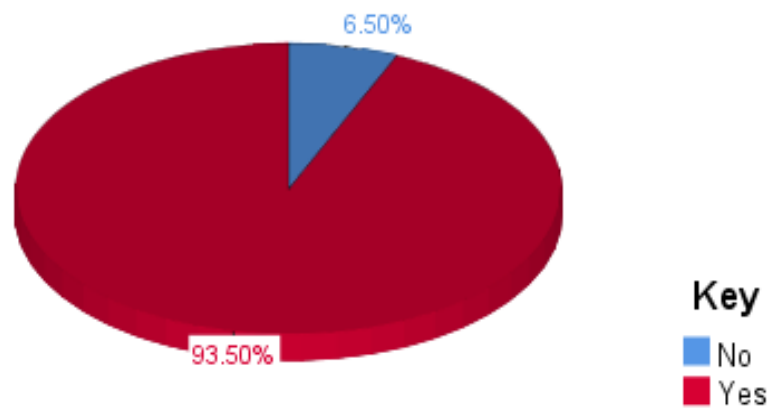
#### x) House Tenure in Study Area

Figure 4.11 shows housing tenure in the study area and its distribution across the three neighbourhoods. Findings show that 61.38% of residents in Eldoret Municipality own their homes while 38.62% rent. Further analysis of housing tenure across the residential neighbourhoods revealed that Elgon view had the highest number of homeowners (94.74%). In Kimumu the distribution was almost even, however, home owners (59.63%) were still more compared to renters 40.37%. On the other hand, Munyaka had the highest number of renters (60%) compared to homeowners (40%). The results show that most residents in low-density neighbourhoods are owners while most of those in high-density neighbourhoods are tenants.



**Figure 4.11 Housing Tenure by Residential Neighbourhood**

Figure 4.12 shows the likelihood that the respondent would recommend a friend and or a relative to stay in their residential neighbourhood. A majority of the respondents 93.50% agreed that they would recommend a friend or relative to stay in their residential environment.



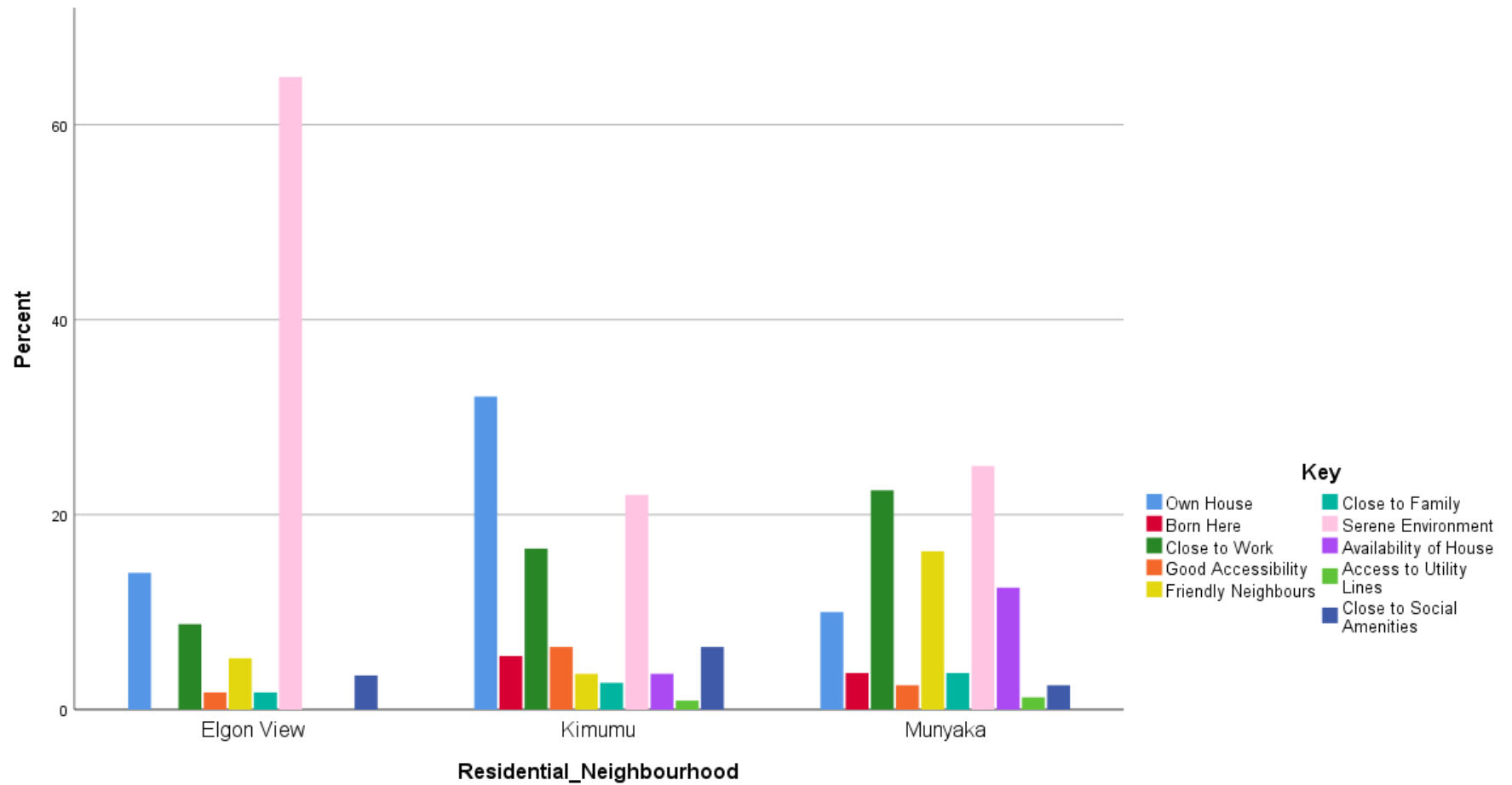
**Figure 4.12 Likelihood to Recommend a Friend and or a Relative to Stay in Residential Environment.**

### **xi) Motives Behind Occupation of Residential Neighbourhood**

Figure 4.13 shows the reasons why residents chose to occupy various residential neighbourhoods across Eldoret Municipality. Elgon View had 64.91% of the residents stating that they occupied the neighbourhood because it provided a serene environment or peaceful and quiet for them, homeownership 14.04% was the second major reason followed by proximity to work 8.77%, friendly neighbours 5.26%, proximity to social amenities 3.51%, good accessibility and proximity to family at 1.75% each.

Unlike, Elgon View where the motive behind the occupation of the neighbourhood was skewed towards environmental serenity, residents in Kimumu had fairly even reasons behind its occupation. Kimumu had homeownership 32.11% as the main reason behind the occupation, followed by environmental serenity 22.02%, proximity to work 16.51%, good accessibility and proximity to social amenities 6.42% each, place of birth 5.50%, availability of dwelling unit and friendly neighbours 3.67% each and proximity to family 2.75%.

Motives behind the occupation of Munyaka neighbourhood were fairly spread out. There were five main reasons for occupation of Munyaka neighbourhood, including environmental serenity 25%, proximity to work 22.5%, friendly neighbours 16.25%, availability of dwelling units 12.5% and homeownership 10%. Other reasons include a place of birth and proximity to family 3.75% each, good accessibility and proximity to social amenities 2.5% each and access to utility lines 1.25%.



**Figure 4.13 Reason for Occupation of Residential Environment.**

#### 4.4 Relationship between selected housing attributes and residential satisfaction

The section second objective that sought to determine the effect of housing attributes on residential satisfaction in Eldoret Municipality. It presents descriptive statistics on housing attributes that are dwelling unit features and neighbourhood features in Eldoret Municipality and ordinal logistic regression to model the relationship between housing attributes and residential satisfaction.

##### 4.4.1 Dwelling Unit Attributes

Selected dwelling unit Attributes for this study include housing typology, number of rooms, building material, natural ventilation, natural lighting, general cleanliness and environmental aesthetics and housing expenditure.

##### i) Housing Typology and Building Material

Table 4.11 summarizes observed field statistics on housing typology, number of bedrooms and housing building material that is roofing, wall and floor.

**Table 4.11 Dwelling unit Features Summary**

Dwelling Unit Features		Frequency	Percent
Housing Typology	Row Housing	105	42.7
	Bungalow	96	39.0
	Maisonette	35	14.2
	Flats	10	4.1
	Total	246	100.0
Roofing Material	Iron Sheets	191	77.6
	Roofing Tiles	55	22.4
	Total	246	100.0
Wall Material	Mud	20	8.1
	Iron Sheets	26	10.6
	Wood	3	1.2
	Stone & Concrete	197	80.1
	Total	246	100.0
Floor Material	Mud	9	3.7
	Cemented	105	42.7
	Tiles	132	53.7
	Total	246	100.0

From the findings summarized in the table above, it is evident that row housing was the dominant housing typology at 42.7%, followed by bungalow 39.0%, maisonette at 14.2% and lastly Flats at 4.1%. In terms of building material, Iron sheets were the dominant roofing material at 77.6% followed by roofing tiles at 22.4%. Wall building material was dominated by stone and concrete at 80.1%, iron sheet at 10.6%, mud 8.1% and wood 1.2%. Floor building material was Tiles at 53.7%, cemented 42.7% and mud 3.7% as shown in figure 4.4 on house typology distribution across the three residential neighbourhoods.

Figure 4.14 presents graphical illustrations of housing typologies and building material are distributed across the three residential neighbourhoods.



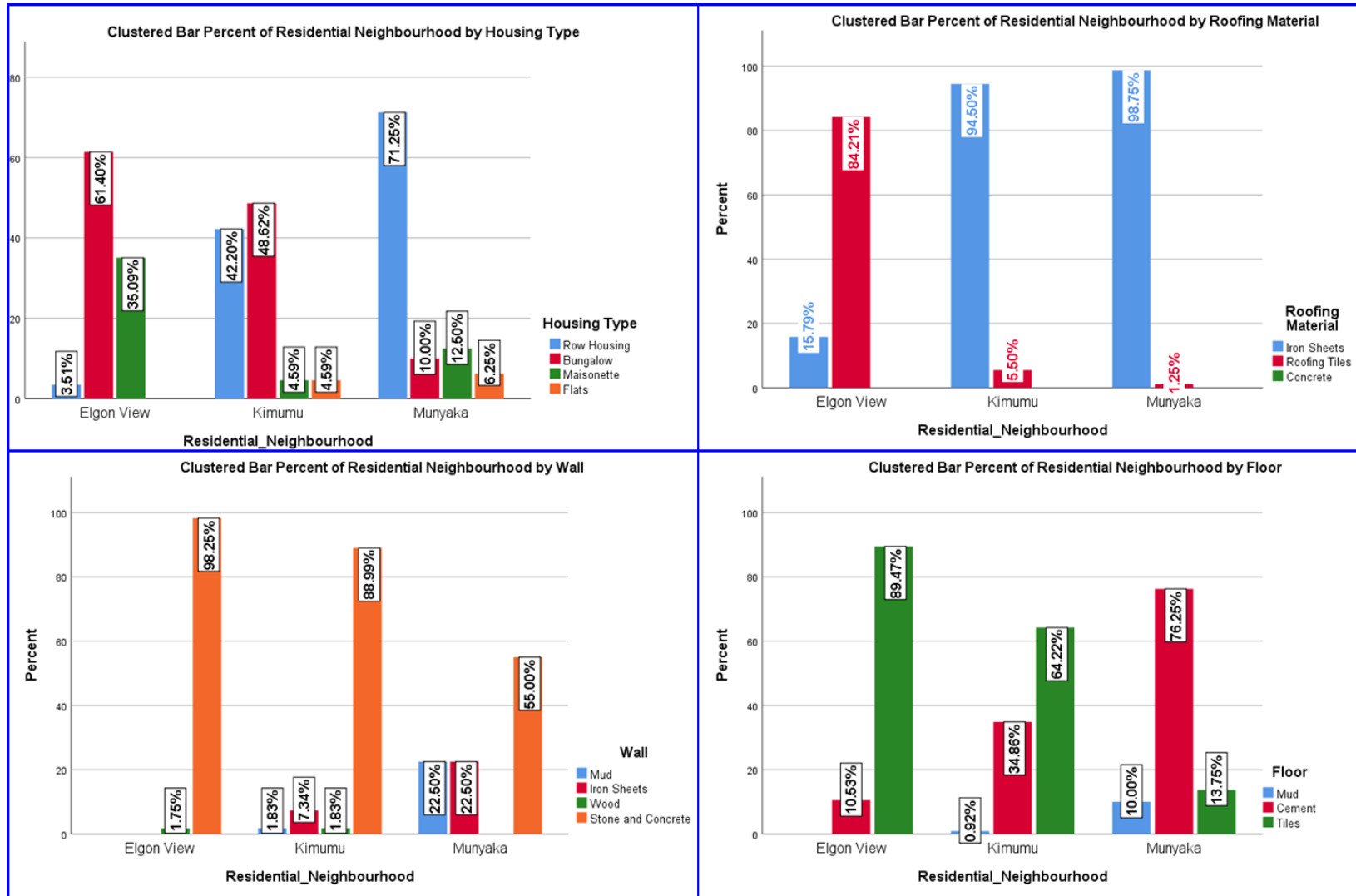
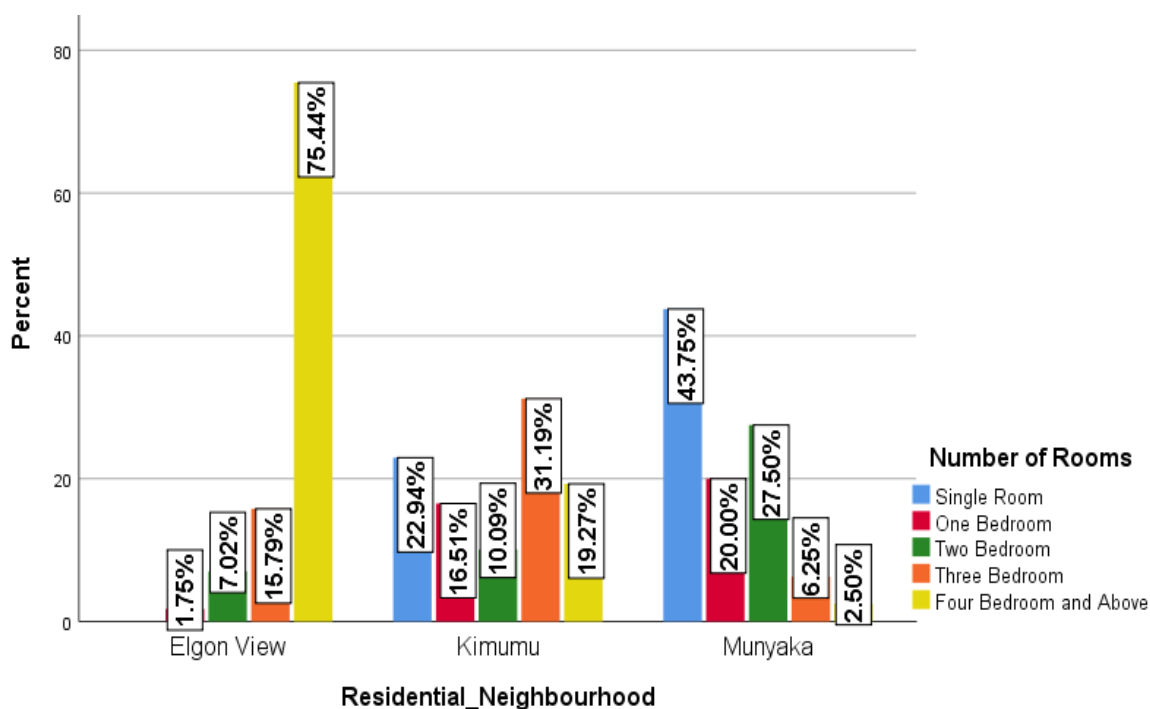


Figure 4.14 Housing Typology and Building Material Across Residential Neighbourhoods

The dominant housing typology in Elgon View, a low-density residential neighbourhood is a bungalow making up to 61.4% of all housing, followed by maisonette at 35.09% and row housing at 3.51%. Bungalow and row housing in Kimumu are almost similar in variety of housing that is 48.62% and 42.20% respectively. In this neighbourhood, maisonette and flats are the least dominant housing typologies with an equivalent percentage of 4.59%. Munyaka is dominated by row housing 71.25%, maisonette 12.5%, bungalow 10% and flats 6.25%. In terms of roofing material, Elgon View has the highest percentage of usage of roofing tiles at 84.21% while iron sheet is only 15.79%. Kimumu and Munyaka dwelling units are largely roofed using iron sheet 94.50% and 98.75% as opposed to roofing tiles 5.5% and 1.25% respectively. In terms of wall-building material across the three residential neighbourhoods, stone and concrete dominate the three neighbourhoods at 98.25%, 88.99% and 55% for Elgon View, Kimumu and Munyaka respectively. Instances of wood as wall material appear in Elgon View and Kimumu at 1.75% and 1.83% respectively. Mud houses in Kimumu had 1.83% and 22.5% in Munyaka while iron sheet wall accounted for 7.34% in Kimumu and 22.5% Munyaka. In terms of floor material, it was evident that most housing floor material in Elgon View 89.47% and Kimumu 64.22% was tiles while in Munyaka it only accounted for 13.75% of all dwelling units. Cemented floors made up 10.53%, 34.86% and 76.25% of housing in Elgon View, Kimumu and Munyaka respectively. Mud floor was only observed in Munyaka 10% and Kimumu 0.92%.

## **ii) Number of Rooms**

From Figure 4.15, Elgon view had the highest number of bedrooms per dwelling unit where four-bedroom and above houses made up 75.44% of the housing in the neighbourhood.

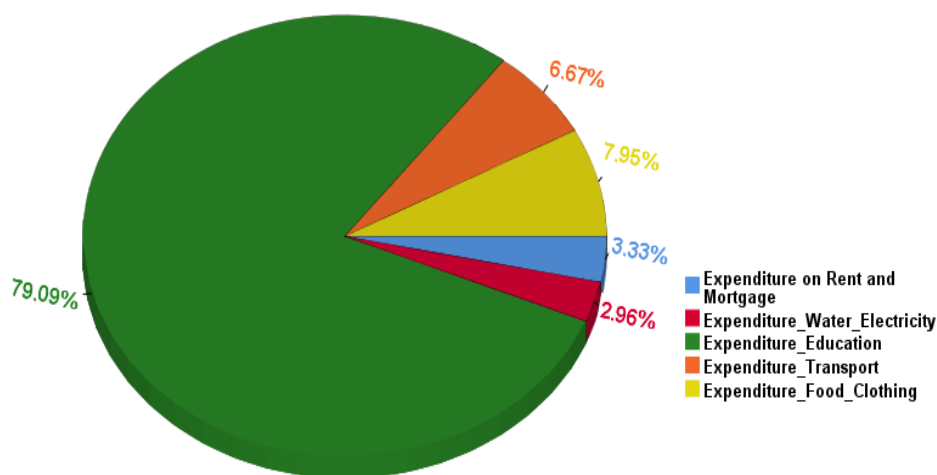


**Figure 4.15 Number of Bedrooms across the Residential Neighbourhoods**

Others, that is, one bedroom, two bedrooms and three bedrooms make up 1.8%, 7.0% and 15.79% in the same neighbourhood respectively. Of the three neighbourhoods Kimumu, had the most even distribution of housing in term of the number of bedrooms. It can be seen from Figure 4.8 that; three bedroomed houses are dominant in Kimumu at 31.19% followed closely by Single rooms at 23.0%. Four and above bedroomed housed make up 19.27% while one and two bedroomed houses accounted for 16.51% and 10.09% respectively. Munyaka had the highest number of single rooms that is 43.75% and the least number of dwelling units with four and above bedrooms (2.5%). In this same neighbourhood, one, two and three bedroomed dwelling units make up 20%, 27.5% and 6.25% of the dwelling units. This distribution reflects the density of these neighbourhoods. The mean number of bedrooms for residential neighbourhoods in Eldoret Municipality was found to be three (3) bedrooms per dwelling unit.

### iii) Household Expenditure

The household variables whose expenditure was sought included water and electricity, education, transport, food and clothing, rent and mortgages. Figure 4.16 illustrates findings on household expenditures.

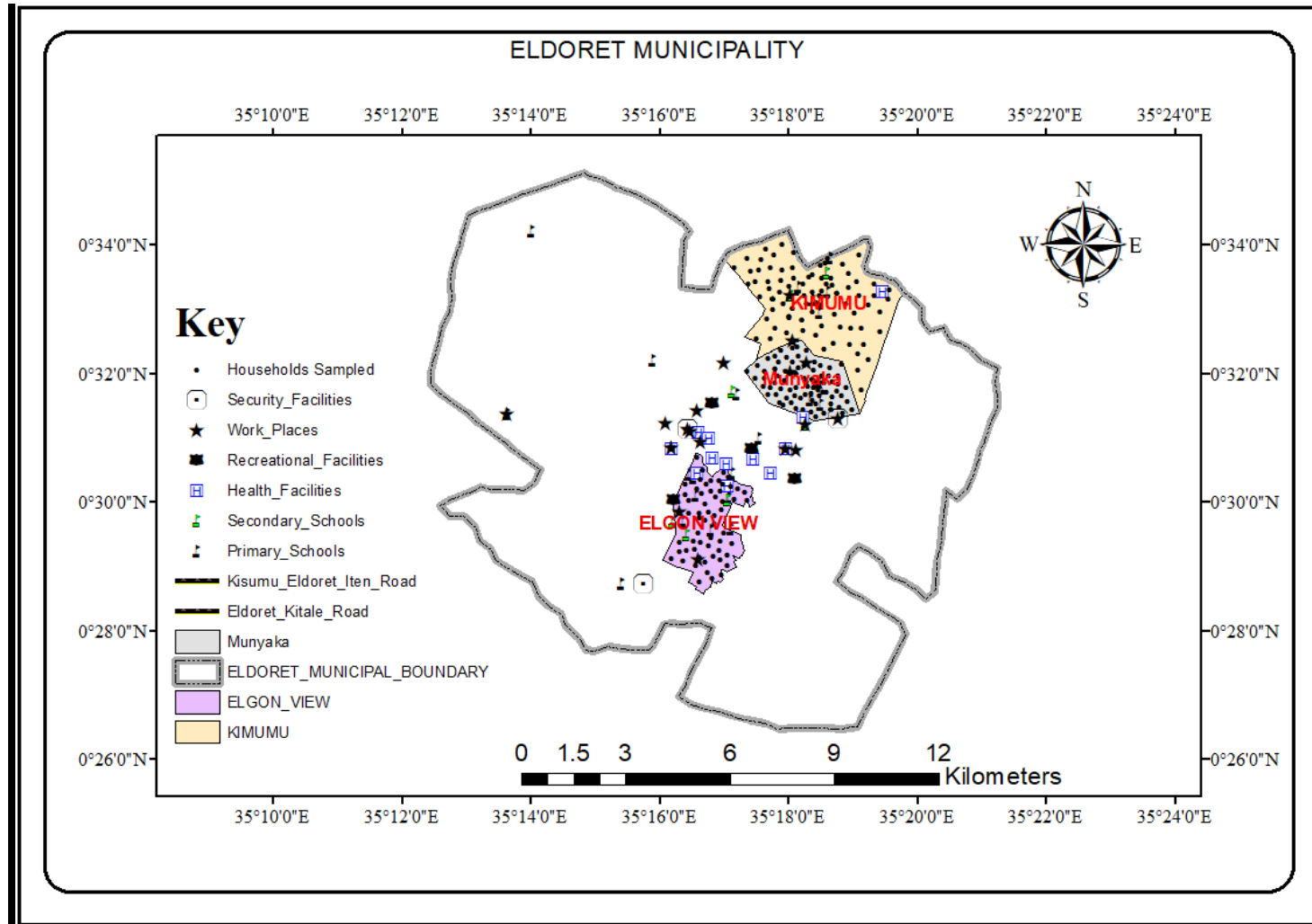


**Figure 4.16 Housing Expenditures**

From the figure, it is evident that education with a percentage of 79.09% weighs more on the housing budget, followed by food and clothing at 7.95%, transportation cost at 6.67%, rent and mortgage at 3.33% and the least is water and electricity at 2.96%. The cost of transport, rent and mortgage combined makes up to 12.96%.

#### 4.4.2 Neighbourhood Attributes

Selected neighbourhood attributes for this study include distances to various functional areas such as healthcare facilities, leisure facilities, work and schools (both primary and secondary). Further, as part of the neighbourhood features, perceptions on quality-of-service delivery such as public transport and security, neighbourhood cleanliness, water service delivery, electricity supply, condition of roads and street lighting were assessed. Figure 4.17 presents a map showing the distribution of the sampled households and neighbourhood features.



**Figure 4.17 Distribution of Neighbourhood Attributes and Sampled Households**

Figure 4.18 presents the distribution of various amenities in the sampled residential neighbourhoods in metres.



**Figure 4.18 Mean Distance to Social Amenities**

Healthcare facilities and workplaces have got the longest mean distance of reach that is 3.3km and 3.1 km from residential neighbourhoods respectively. Mean distance to secondary school, leisure facility, primary school and access to bitumen standard road are 1.8km, 1.3km, 1km and 0.93km respectively. Table 4.12 further illustrates the distribution of these social amenities in details across the sampled residential neighbourhoods.

**Table 4.12 Summary of Mean Distances to Various Neighbourhood Facilities**

<b>Residential Neighbourhood</b>	<b>Distance to Primary School (Metres)</b>	<b>Distance to Bitumen Standard Road (Metres)</b>	<b>Distance to Secondary School (Metres)</b>	<b>Distance to Healthcare (Metres)</b>	<b>Distance to Leisure Facility (metres)</b>	<b>Distance to Work Place (metres)</b>
Elgon View	1143.33	813.42	2120.18	3014.04	1860.53	5482.46
Kimumu	1141.83	1127.6	1613.58	4220.18	1433.94	3833.94
Munyaka	749.38	1010.14	1811.25	2043.50	837.50	651.75
Total	1014.55	925.72	1795.24	3232.85	1338.82	3181.06

The mean distance of travel to Primary school was almost similar in Elgon View and Kimumu at 1.143km and 1.141km respectively while Munyaka had the least 0.749km. Also travel to work mean distance Elgon View is at 5.482km, Kimumu 3.833km and Munyaka 0.651km. Distance to other amenities includes distance to bitumen standard road 1.387km, 0.803km, 0.76km, secondary school 2.12km, 1.614km, 1.811km, healthcare facility 3.014km, 4.22km, 2.044km and leisure facility 1.861km, 1.434km and 0.838km for Elgon View, Kimumu and Munyaka respectively.

#### **4.4.3 Ordinal Logistic Regression on Housing Attributes and Residential Satisfaction**

An ordinal logistic regression (OLR) was conducted in a stepwise fashion to determine the model that best describes the relationship between the selected housing attributes (independent variables) and residential satisfaction (dependent variable).

The initial model had all the sixteen (16) housing variables (independent variables) that is neighbourhood hygiene, environmental aesthetics, distance to primary school, secondary school, workplace, healthcare facility, access to retail shopping centres,

access to public transport, access to recreational facilities, neighbourhood hygiene, number of rooms, rent and mortgage expenses, public security, lighting, ventilation and expenditure on transport. The stepwise analysis eventually led to the final model with four (4) significant predictors (independent variables) of residential satisfaction that is neighbourhood hygiene ( $p=.046$ ), public security ( $p=.049$ ), number of rooms ( $p=.000$ ) and environmental aesthetics ( $p=.002$ ) with a predicted increase of .441, .445, .418 and .694 in the probability of a resident being in a higher level of residential satisfaction as opposed to a lower level respectively. Table 4.13 shows the final model with four sets of the independent variable to define the relationship between residential satisfaction and selected housing attributes.

**Table 4.13 Final Ordinal Logistic Regression Model with Predictors of Residential Satisfaction**

	<b>Estimate</b>	<b>Std. Error</b>	<b>Wald</b>	<b>Sig</b>
Neighbourhood Hygiene	.441	.221	3.995	.046
Public Security	.445	.226	3.877	.049
Number of Rooms	.418	.116	12.916	.000
Environmental Aesthetics	.694	.221	9.809	.002
Link function: Logit				

Table 4.14 shows the model fitting information with the -2 Log Likelihood for an intercept only model/ null model and the final model with the full set of predictors, that is, the stated dwelling unit and neighbourhood attributes. It also presents the likelihood ratio chi-square test to determine if there is a significant improvement in the fit of the final model relative to the intercept only model/ null model with no predictors. The results show a significant improvement in the fit of the final model over the baseline null model with no predictors [ $X^2(4) = 93.414, p = .000$ ]. This implies that the model serves well to describe the relationship between residential satisfaction and housing attributes.



**Table 4.14 Model Fitting Information**

Model	-2 Likelihood	Log Chi-Square	Df	Sig.
Intercept Only	322.236			
Final	228.822	93.414	4	.000
Link function: Logit.				

The goodness of fit as presented in Table 4.15 contains the Deviance and Pearson Chi-square tests which are useful in determining whether the model exhibits good fit to the data. Both the Pearson chi-square test [ $X^2(220) = 338.415, p = .453$ ] and the deviance test [ $X^2(220) = 157.318, p = .674$ ] are non-significant. Non-significant test results show that the model fits well to the data (Field, 2018 & 2009).

**Table 4.15 Goodness of Fit**

	Chi-Square	df	Sig.
Pearson	338.415	220	.453
Deviance	157.318	220	.674
Link function: Logit.			

Table 4.16 shows the pseudo-R-square values which are estimate analogues to R-squares and least squares regression. Pseudo R-square value for Cox and Snell and Nagelkerke are .316 and .354 respectively. According to Field, (2018; 2009), values in the range of 0.2 to 0.4 are an indicator of a good fitting model thus conclude that housing attributes have a significant impact on residential satisfaction.

**Table 4.16 Pseudo R-Square**

Cox and Snell	.316
Nagelkerke	.354
Link function: Logit.	

The proportional odds assumption states that the relationship between the independent variable and the dependent variable is constant, irrespective of which groups are being compared on the dependent variable (Osborne, 2014, 2017). A non-significant test of

parallel lines ( $p = .462$ ) means the assumption is satisfied hence the models serve well to describe the relationship. Table 4.17 shows the test of parallel lines.

**Table 4.17 Test of Parallel Lines**

<b>Test of Parallel Lines<sup>a</sup></b>					
<b>Model</b>	<b>-2 Likelihood</b>	<b>Log Chi-Square</b>	<b>Df</b>	<b>Sig.</b>	
Null Hypothesis	228.822				
General	197.487 <sup>b</sup>	31.336 <sup>c</sup>	12	.462	
The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.					
a. Link function: Logit.					
b. The log-likelihood value cannot be further increased after maximum number of step-halving.					
c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.					

#### **4.5 Relationship between household socio-economic characteristics and residential satisfaction**

##### **4.5.1 Socio-economic Characteristics of Respondents**

The third objective of the study sought to determine the influence of household socio-economic attributes on residential satisfaction. It is presented in two parts. Part one focus on descriptive statistics on household sociodemographic characteristics in Eldoret Municipality and part 2 captures ordinal logistic regression model on the relationship between household sociodemographic characteristics and residential. Table 4.18 summarizes the socioeconomic characteristics of households in the study area. From the table, 84.1% of the respondents were married and 15.9% were single. The first and the last income groups that is below Kshs. 10,000 and above Kshs. 100,000 had the highest percentage of residents of 34.6% and 16.7% respectively. This was followed by the Kshs. 10,001 to Kshs. 20,000 income group with 11% of the respondents. The rest of the income groups had a percentage distribution of between 3.7 to 8.1%. From the cumulative per cent, a larger proportion of the respondents 65.9% earn below Kshs.

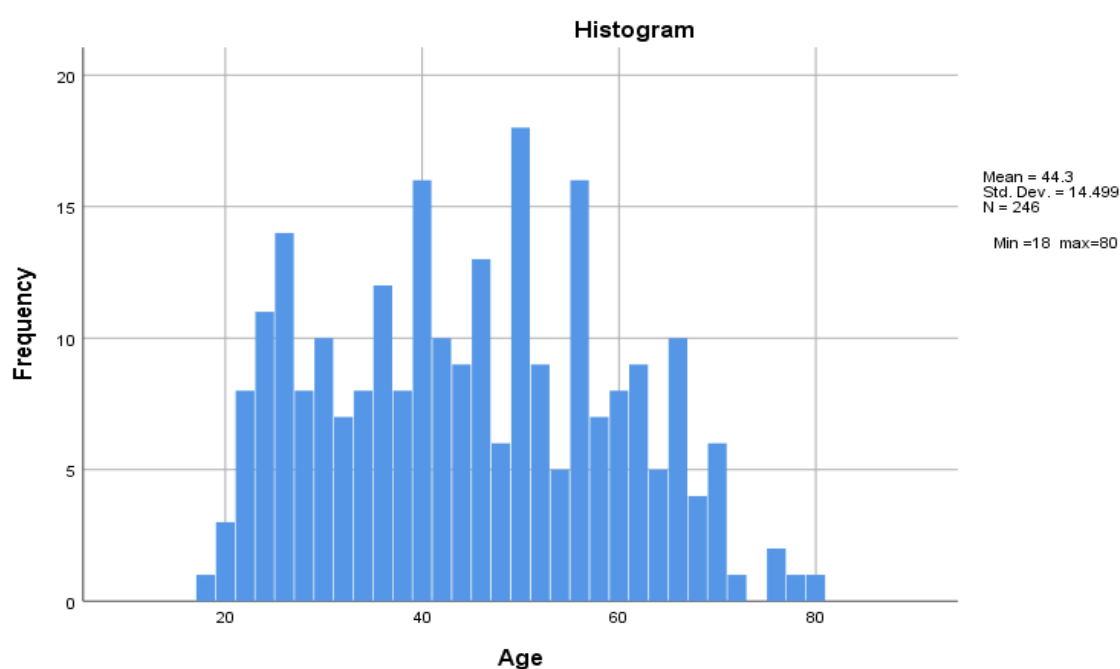
50,001. Most residents in the municipality had 43.9% being self-employed followed by the public service sector at 27.2%, casual labourer at 14.2%, private sector accounted for 13.4% while those on pension were 1.2%. Most of the residents (59.3%) as seen from the sample, have attained a tertiary level of education, followed by secondary 27.2%, primary 11.8% and none at 1.6% respectively. Owner-occupants were more than renter occupants that are 61.4% and 38.4% of the sample size respectively.

**Table 4.18 Socio Economic Characteristics of Households in Eldoret Municipality**

Sociodemographic characteristic		Frequency	Mean	Percent
Occupant (Renter Vis a Vis Owner)	Renter	95		38.6
	Owner	151		61.4
Age		246	44.3	
Marital Status	Married	207		84.1
	Single	39		15.9
Level of Education	None	4		1.6
	Primary	29		11.8
	Secondary	67		27.2
	Tertiary	146		59.3
Income	Below Kshs. 10,000	85		34.6
	Kshs. 10,001 - 20,000	27		11.0
	Kshs. 20,001 - 30,000	15		6.1
	Kshs. 30,001 - 40,000	15		6.1
	Kshs. 40,001 - 50,000	20		8.1
	Kshs. 50,001 - 60,000	2		.8
	Kshs. 60,001 - 70,000	9		3.7
	Kshs. 70,001 - 80,000	15		6.1
	Kshs. 90,001 - 100,000	17		6.9
	Above Kshs. 100,000	41		16.7
Employment Sector	Public Service	67		27.2
	Self Employed	108		43.9
	Casual Labourers	35		14.2
	Private Sector	33		13.4
	Pension	3		1.2
Household Size	1	25	4.24	10.2
	2	7		2.8
	3	40		16.3

4	61	24.8
5	65	26.4
6	31	12.6
7	12	4.9
8	2	.8
9	1	.4
10	2	.8

Figure 4.19 is a histogram showing the age distributions of the neighbourhoods. From the figure, it can be seen that the minimum age was 18 years while the maximum was 80 years.



**Figure 4.19 Age Distribution of Residents**

Figure 4.20 illustrates the household socio-demographic characteristics across neighbourhoods in Eldoret Municipality. The mean age of household heads in Elgon view, Kimumu and Munyaka were 52, 42 and 41 respectively. In Elgon View, 91.23% had attained a tertiary level of education followed by 66.97% in Kimumu and 26.25% in Munyaka. In the secondary education level category, Munyaka recorded the highest percentage of 45% of individuals who had secondary education as the highest level of education followed by Kimumu 24.77% and Elgon View 7.02%. Further, Munyaka had

26.25% individual who had primary as the highest level of education followed by Kimumu 6.42% and Elgon View with 1.75%. While Munyaka and Kimumu recorded 2.5% and 1.83% individuals with no education respectively. Elgon view had none. In terms of house tenure of occupancy, Elgon View recorded the highest percentage of owner-occupants 94.74% followed by Kimumu, 59.63% and Munyaka had the least 40%. Conversely, Munyaka had the highest renter occupants at 60% followed by Kimumu with 40.37%, while Elgon View 5.26%. Marital status was fairly distributed with married in Elgon View, Kimumu and Munyaka recording 92.98%, 79.82% and 83.75% respectively while single was 7.02% Elgon View, 20.18% Kimumu and 16.25% Munyaka

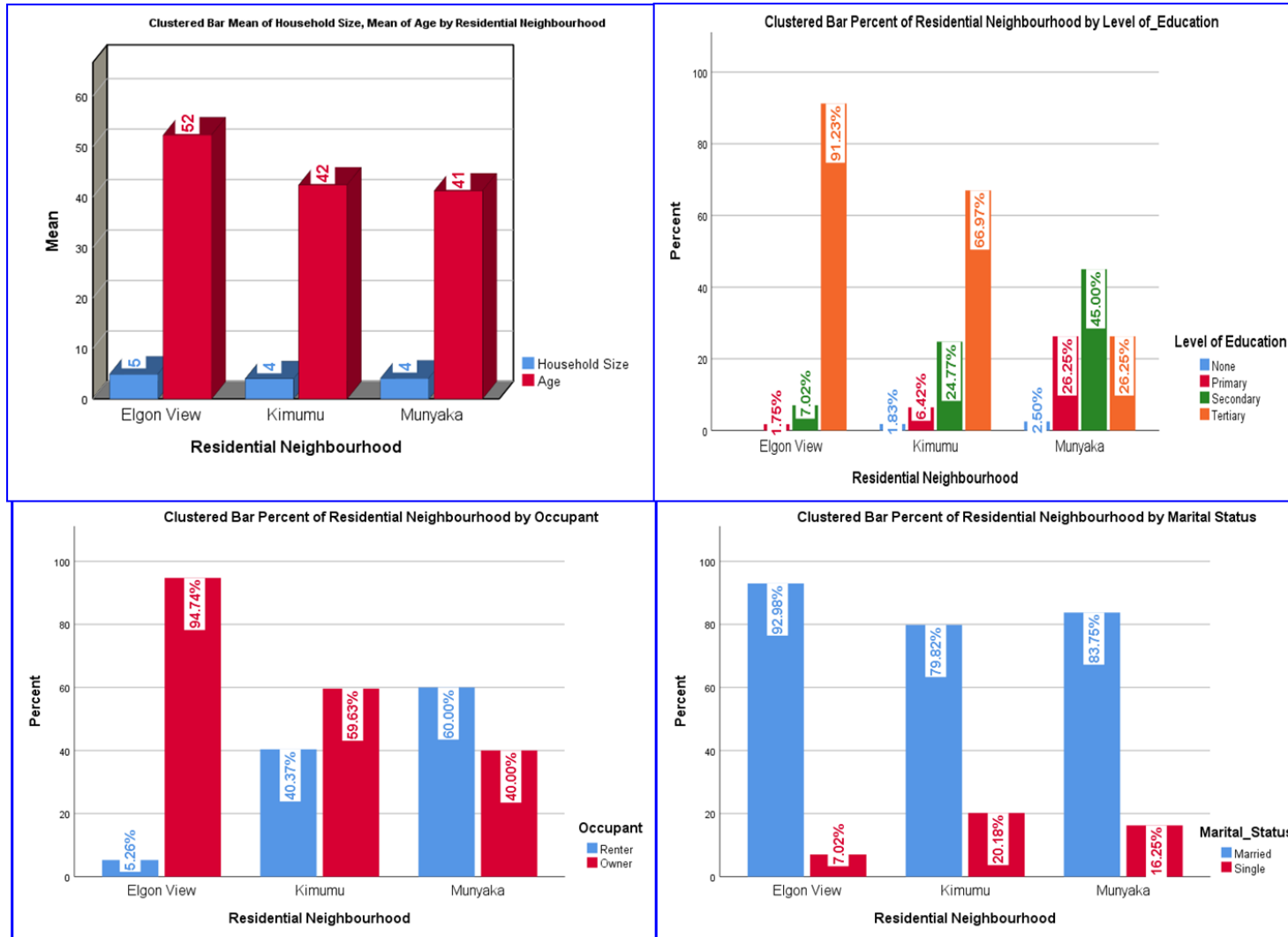
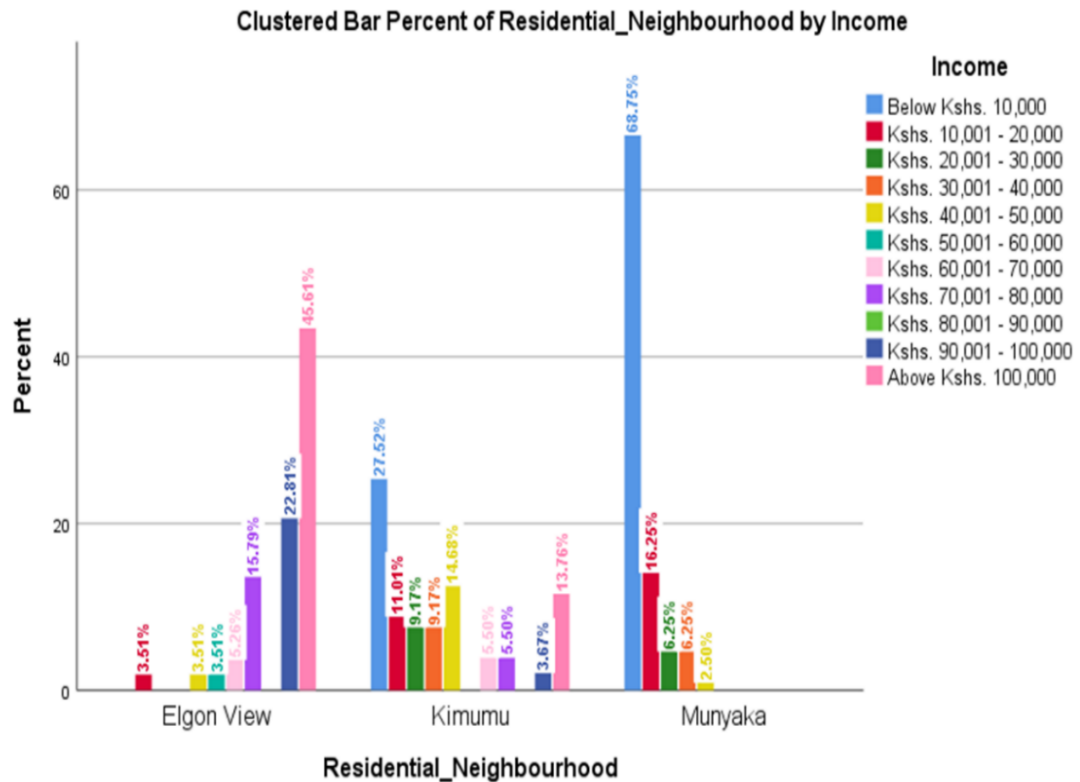


Figure 4.20 Clustered Bar Graphs Illustrating Household Socio-demographic Characteristics Across Neighbourhoods.

Figure 4.21 illustrates income distribution across the sampled residential neighbourhoods of the study area. From the figure, Elgon View recorded the highest percentage of 45.61% of individuals in the above Kshs. 100,000 income categories, Kimumu had 13.7% while Munyaka had none. Further, category Kshs. 90,001 – 100,000, Kshs. 70,001 – 80,000 and Kshs. 60,001 – 70,000 in Elgon View recorded 22.81%, 15.79% and 5.26% respectively while category of Kshs. 50,001 – 60,000, Kshs. 40,001 – 50,000 and Kshs. 10,001 – 20,000 in Elgon View had each 3.51%. Though income distribution was almost fairly distributed in Kimumu, category below Kshs. 10,000 had the highest percentage 27.52% followed by Kshs. 40,001 – 50,000 and Kshs. 10,001 – 20,000 at 14.68% and 11.01% respectively while category Kshs. 20,001 – 30,000 and Kshs. 30,001 – 40,00 had 9.17% each. The highest recorded income category level in Munyaka was category Kshs. 40,001 – 50,000 with a percentage of 2.5%. most of the residents in Munyaka 68.75% were in the below Kshs. 10,000 categories followed by 16.25% in the Kshs. 10,001 – 20,000 while category Kshs. 20,001 – 30,000 and Kshs. 30,001 – 40,00 had each 6.25%.



**Figure 4.21 Income Distribution Across Neighbourhoods.**

#### **4.5.2 Ordinal Logistic Regression on Socio-Economic Attributes and Residential Satisfaction**

An ordinal logistic regression (OLR) was conducted in a stepwise fashion to determine the model that best describes the relationship between the selected socio-economic attributes (independent variables) and residential satisfaction (dependent variable). The initial model had all the nine (9) socio-economic attributes (independent variables) that is age, household size, marital status, level of education, employment status, income, duration of residence, housing expenses and house tenure. The proportional odds assumption was met with the final regression model having seven (7) housing attributes that is age, household size, marital status, level of education, employment status, income and house tenure that were socioeconomic determinants of residential satisfaction.



Table 4.19 below shows the case processing summary for the dependent ordinal variables. From the table, it is evident that most residents of Eldoret Municipality were very satisfied (59.8%) with their housing followed by moderately satisfied (21.1%), extremely satisfied (11%), slightly satisfied (6.9%) and not satisfied (1.2%).

**Table 4.19 Case Processing Summary**

Rating of Residential Satisfaction		N	Marginal Percentage
Residential Satisfaction	Not Satisfied	3	1.2%
	Slightly Satisfied	17	6.9%
	Moderately Satisfied	52	21.1%
	Very Satisfied	147	59.8%
	Extremely Satisfied	27	11.0%
Total		246	100.0%

Table 4.20 shows the model fitting information with the -2 Log Likelihood for an intercept only model/ null model and the final model with the full set of predictors (age, household size, income, level of education, employment and occupant whether renter or owner that is the sociodemographic characteristics as the independent variables. Further, it also presents the likelihood ratio chi-square test to test whether there is a significant improvement in fit of the final model relative to the intercept only model/ null model with no predictors. The results show a significant improvement in fit of the final model over the baseline null model with no predictors [ $X^2(7) = 113.950, p = .000$ ]. This implies that the model serves well to describe the relationship between socio economic characteristics and residential satisfaction.

**Table 4.20 Model Fitting Information**

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	534.701			
Final	420.751	113.950	7	.000
Link function: Logit.				

The goodness of fit Table 4.21 contains the Deviance and Pearson Chi-square tests which are useful in determining if the model exhibits good fit to the data. Non-significant test results show that the model fits well to the data (Field, 2018). In this analysis, both the Pearson chi-square test [ $X^2(905) = 2006.773, p = .978$ ] and the deviance test [ $X^2(905) = 407.568, p = .987$ ] are non-significant.

**Table 4.21 Goodness of Fit**

	<b>Chi-Square</b>	<b>df</b>	<b>Sig.</b>
Pearson	2006.773	905	.978
Deviance	407.568	905	.987
<b>Link function: Logit.</b>			

Table 4.22 shows the pseudo-R-square values which are estimate analogues to R-squares and least squares regression. Pseudo R-square value for Cox & Snell and Nagelkerke are 0.371 and 0.415 respectively. According to Field, (2018), values in the range of 0.2 to 0.4 are an indicator of a good fitting model. This implies that socioeconomic characteristics have a significant impact on residential satisfaction.

**Table 4.22 Pseudo R-Square**

Cox & Snell	.371
Nagelkerke	.415
<b>Link function: Logit.</b>	

The stepwise analysis eventually led to the final model with seven (7) socio-economic determinants (independent variables) of residential satisfaction see Table 4.23. Marital status, income level, employment and house tenure were significant positive predictors of residential satisfaction ( $p < .05$ ). The probability of being in a higher level of residential satisfaction was 0.956, 0.408, 0.771 and 0.965 higher on average for those in the married category, higher-income groups, the employed groups and homeowners as compared to those in single marital status, lower-income groups, unemployed category and home renters respectively. This shows that households in the married category, higher-income category, employed and home were more likely to be satisfied with their

residential environment as opposed to those in the single marital status, households in the lower-income groups, households with no employment and home renters.

Age, household size and level of education were negative predictors of residential satisfaction. Age was a significant negative predictor of residential satisfaction ( $p=.008$ ) while the household size and level of education were non-significant predictors of residential satisfaction ( $p>0.05$ ). For every unit increase in age, household size and level of education there was predicted a decrease of 0.037, 0.193 and 0.029 respectively in the probability of a resident being in higher level as opposed to a lower level of residential satisfaction.

**Table 4.23 Parameter Estimates**

Socio-economic Variables	Estimate	Std. Error	Wald	Sig.
Age	-.037	.014	6.996	.008
Household Size	-.193	.110	3.100	.078
Marital Status	.956	.452	4.467	.035
Level of Education	-.029	.232	.015	.902
Employment	.771	.302	6.502	.011
Income	.408	.070	34.490	.000
House Tenure	.965	.409	11.127	.001
Link function: Logit				

From the test of parallel lines shown in Table 4.24 shows the results show a non-significant value ( $p=.303$ ), meaning the assumption is satisfied. This implies that the OLR was best to model the relationship as opposed to alternative MLR.

**Table 4.24 Test of Parallel Lines**

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	420.751			
General	395.021 <sup>b</sup>	25.731 <sup>c</sup>	21	.217
The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.				
a. Link function: Logit.				

#### 4.6 Extent of compliance to residential planning standards

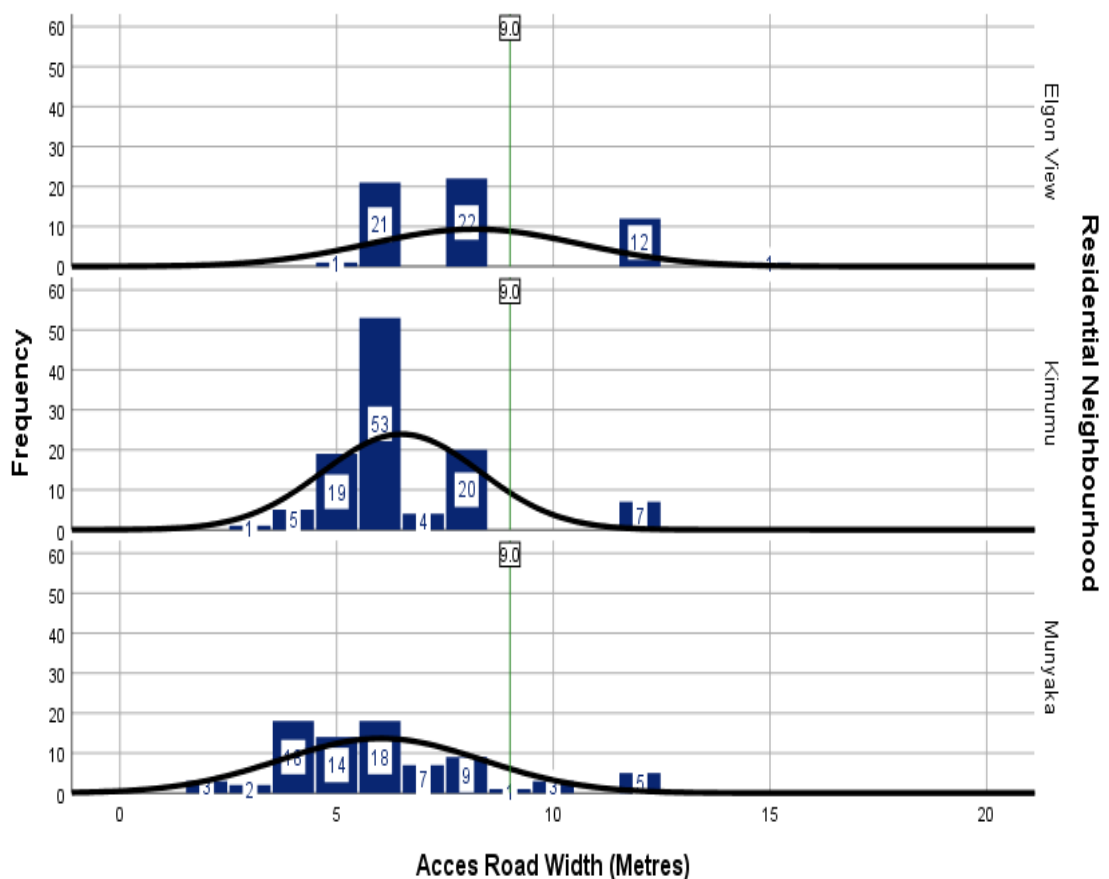
This section presents results on residential compliance to residential planning standards in Eldoret Municipality. Descriptive statistics are used to present these results and also an analysis of variance is performed to assess the variations between the sampled neighbourhoods that is the low-density medium-density and high-density residential neighbourhoods.

Accessibility is a major planning concern in for residential areas. Table 4.25 shows access road width for the dwelling units in the sampled neighbourhoods sampled. Elgon View neighbourhood was leading in terms of accessibility with a mean access road width of 8.18 metres, a maximum of 15 metres, minimum of 5 metres and a standard deviation of 2.436. Kimumu was the second most accessible residential neighbourhood with a mean access road width of 6.50 metres, a maximum of 12 metres, a minimum of 3 metres and a standard deviation of 1.819. The least accessible residential neighbourhood was Munyaka with a mean access road width of 6.03 metres, a maximum of 12 metres, a minimum of 2 metres and a standard deviation of 2.338. In general, this led to a mean access road width of 6.73 metres, a maximum of 15 metres, a minimum of 2 metres and a standard deviation of 2.291.

**Table 4.25 Access Road Width in Elgon View Kimumu and Munyaka**

Access Road Width (Metres)								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Elgon View	57	8.18	2.436	.323	7.53	8.82	5	15
Kimumu	109	6.50	1.819	.174	6.15	6.84	3	12
Munyaka	80	6.03	2.338	.261	5.50	6.55	2	12
Total	246	6.73	2.291	.146	6.44	7.02	2	15

Figure 4.23 is a histogram showing how the various residential neighbourhoods performed in terms of compliance to the minimum 9 metres planning standard (the green vertical line) according to the Physical Planning Handbook (2007). Elgon view followed by Kimumu had a higher number of dwelling units with accessibility above the 9-metre minimum compared to Munyaka as seen in Table 4.24 and Figure 4.16. This is an indicator of a high level of compliance to the minimum 9-metre width for access roads in Elgon view compared to Kimumu and Munyaka respectively. From figure 4.16 the total number of cases that complied to the access road width standard across the three neighbourhoods was 29 out of 246 translating to 11.8% compliance and 88.2% non-compliance.



**Figure 4.22 Compliance to Access Road Width**

To compare the access road width across the three neighbourhoods, an analysis of variance was conducted. Table 4.26 shows the results for the Levene test for homogeneity of variance. The assumption of homogeneity of variance was tested and was found to have been violated using Levine's test,  $F(2,243) = 3.576$ ,  $P = 0.029$  access road width.

**Table 4.26 Test of Homogeneity of Variance**

			<b>Levene Statistic</b>	<b>df1</b>	<b>df2</b>	<b>Sig.</b>
Access Road Width Metres	Based on Mean	on	3.576	2	243	.029

A one-way analysis of variance was conducted to determine whether there was a significant difference in access road width in residential neighbourhoods of Eldoret Municipality ( $N=246$ ). The independent variable, residential neighbourhood included three groups that is Elgon View for low-density residential, Kimumu for Medium density residential and Munyaka for the high-density residential neighbourhood while the dependent variable was access road width. The ANOVA was significant  $F(2,243) = 17.860$ ,  $P = .000$  and therefore it was determined that there was a significant difference in access road width of residential low, medium and high-density neighbourhoods in Eldoret municipality. Table 4.27 shows a one-way ANOVA result.

**Table 4.27 ANOVA Table**

<b>Access Road Width (Metres)</b>					
	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	164.849	2	82.425	17.860	.000
Within Groups	1121.443	243	4.615		
Total	1286.293	245			

Table 4.28 shows the robust test for equality of means. Where the Brown-Forsythe test for equality of means for access road width  $F(2,177.129) = 16.338$ ,  $P = .000$  shows

that there is a significant difference in the means, therefore it was concluded that the access road width was not similar across Elgon View, Kimumu and Munyaka neighbourhoods.

**Table 4.28 Robust Tests for Equality of Means**

Access Road Width (Metres)				
	Statistic <sup>a</sup>	df1	df2	Sig.
Brown-Forsythe	16.338	2	177.129	.000

a. Asymptotically F distributed.

The Post Hoc comparisons to assess pairwise difference among group averages were conducted with the use of Tukey HSD test to further illustrate how the means differ from each other as shown in Table 4.29. The test revealed that the mean access road width of Elgon View (a low-density residential neighbourhood) significantly differed ( $P < .05$ ) from that of Kimumu and Munyaka that is medium and high-density residential neighbourhoods respectively. However, the access road width for Kimumu and Munyaka did not significantly differ from each other ( $P > .05$ ).

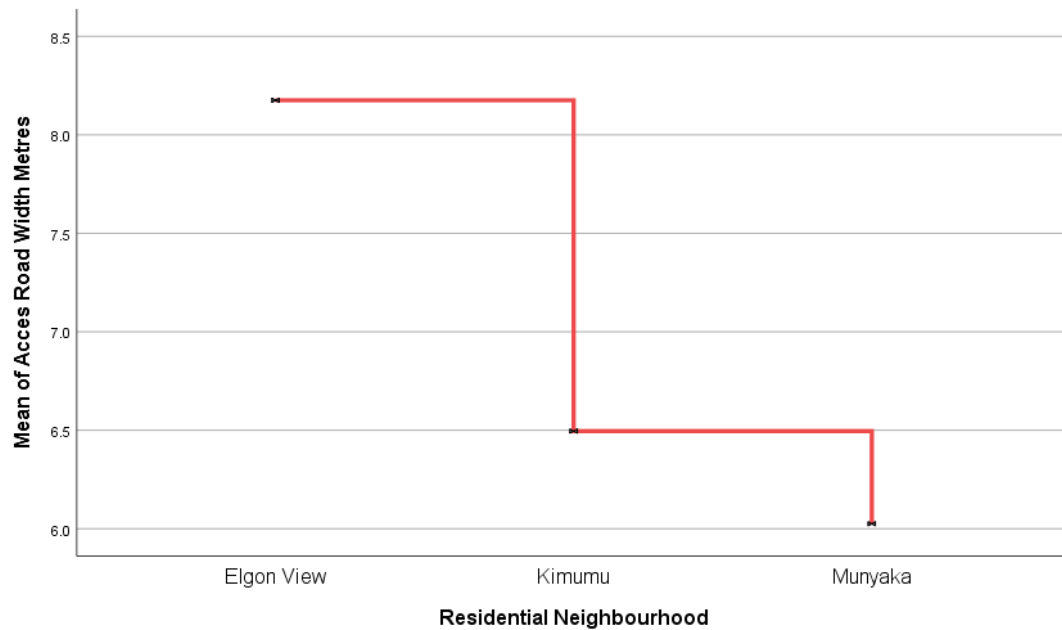
**Table 4.29 Multiple Comparisons**

Dependent Variable: Access Road Width Metres						
Tukey HSD						
(I) Residential Neighbourhood	(J) Residential Neighbourhood	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Elgon View	Kimumu	1.680*	.351	.000	.85	2.51
	Munyaka	2.150*	.372	.000	1.27	3.03
Kimumu	Elgon View	-1.680*	.351	.000	-2.51	-.85
	Munyaka	.470	.316	.299	-.28	1.22
Munyaka	Elgon View	-2.150*	.372	.000	-3.03	-1.27

Kimumu	-.470	.316	.29	-1.22	.28
			9		

\*. The mean difference is significant at the 0.05 level.

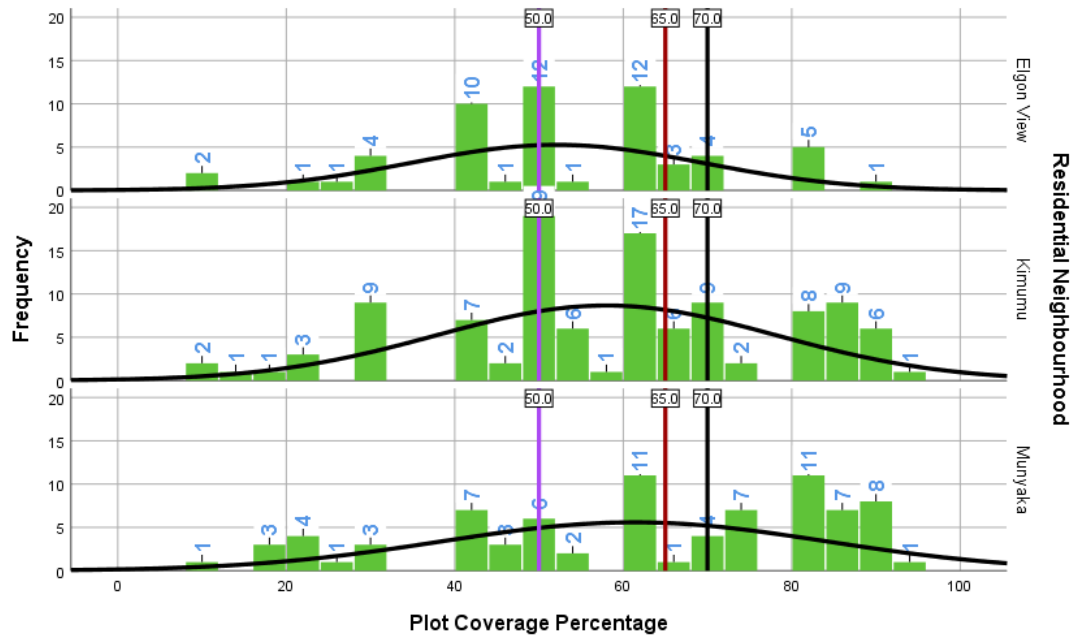
Figure 4.23 is a mean plot of access road width for the three high, medium and low-density residential neighbourhoods. It depicts graphically how the mean width for the three neighbourhoods differ from each other.



**Figure 4.23 Mean Plots for Access Road Width**

Figure 4.24 is a histogram showing the observed statistics of developed areas in terms of percentage in the various residential areas included in the sample. The purple line (50%), the red line (65%) and the black line (70%) shows the limit for the maximum acceptable developable percentage of the plot for low density, medium density and high-density residential neighbourhoods respectively as per the Physical Planning Handbook 2007.





**Figure 4.24 Plot Coverage**

From the figure, it can be seen that Elgon view has 26 out of 57 (45.6%) outcomes violating this standard, Kimumu has 41 out of 109 (37.6%) in violation while Munyaka has 34 out of 80 (42.5%). From the figure, it is also evident that Kimumu and Munyaka neighbourhoods have a high number from the non-compliant cases where developments cover almost 100% of the plot compared to Elgon view. This resulted in 104 cases (42.28%) non-compliance and 142 cases (57.72%) compliance.

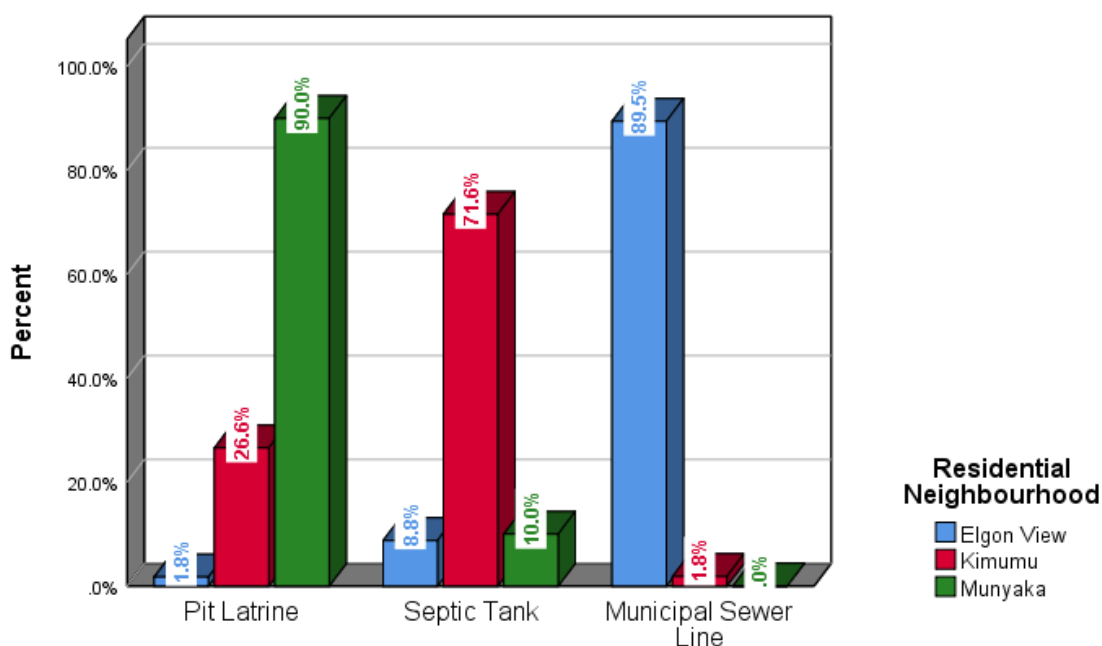
Table 4.30 complements by illustrating further the plot coverage in terms of mean, minimum and maximum observed plot coverage.

**Table 4.30 Plot Coverage Means**

Plot Coverage Percentage								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Elgon View	57	52.11	17.268	2.287	47.52	56.69	10	90
Kimumu	109	57.99	20.070	1.922	54.18	61.80	10	95
Munyaka	80	61.30	22.866	2.557	56.21	66.39	10	95
Total	246	57.70	20.637	1.316	55.11	60.29	10	95

Elgon view had a mean plot coverage of 52.11%, Kimumu had a mean plot coverage of 57.99% while Munyaka had a mean plot coverage of 61.3%. Further, the three neighbourhoods had at least a minimum plot coverage of 10% and a maximum of 90% for Elgon View and 95% for Kimumu and Munyaka.

Figure 4.25 shows the various means of human waste disposal relied upon by the residents from the three neighbourhoods. It can be seen from the figure that Munyaka, a high-density residential neighbourhood largely relies on pit latrines (90%) for their human waste disposal unlike Kimumu (26.6%) and Elgon View (1.8%). Kimumu had a higher percentage (71.6%) of residents using septic compared to Elgon View (8.8%) and Munyaka (10%). Elgon View had more of municipal sewer line for human waste disposal (89.5%) as compared to Kimumu (1.8%) and Munyaka at (0%).



**Figure 4.25 Human Waste Disposal Mechanisms**

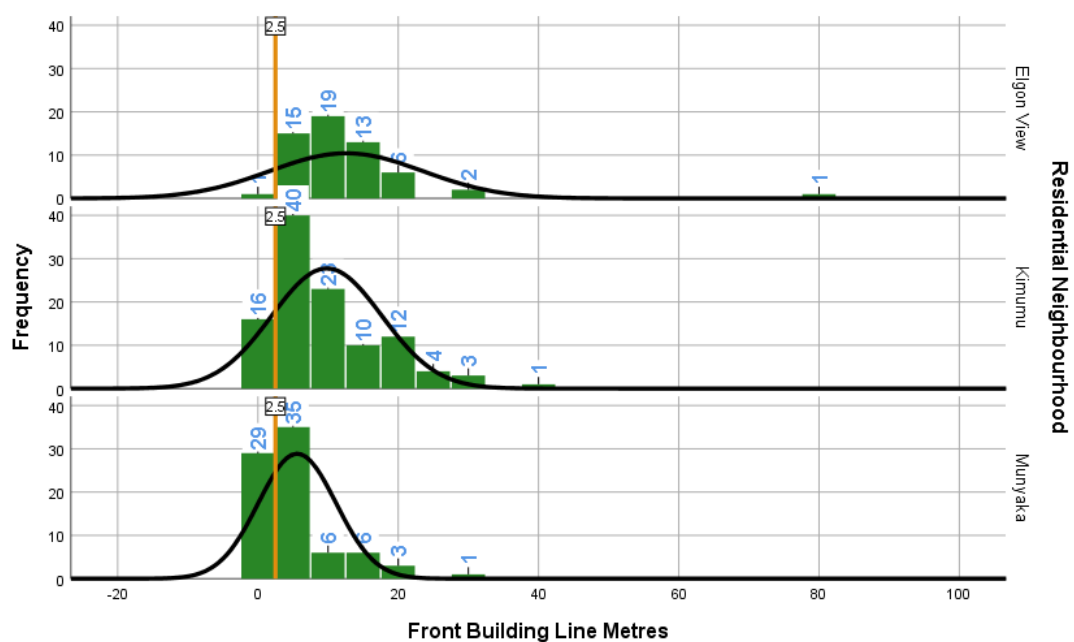
Table 4.31 demonstrates the observed mean building lines in metres of the sampled dwelling units. The standard minimum for building line as per the Physical Planning Handbook (2007) is 2.5 metres for front, 3 metres rear and 1.5 metres for side. It is evident from the table that Elgon View has done well on average in observing the recommended building line where the mean front is 12.58 metres, 7.26 rear and 7.33 metres side. Kimumu has also complied to this on average with a mean distance of 9.81 metres front, 3.64 metres rear and 4.777 metres side. Munyaka has on average 5.59 metres front, 1.37 metres rear which is marginally below the standard and 1.2 metres side which is also slightly below the standard for the neighbourhood.

**Table 4.31 Mean Building Lines**

Residential Neighbourhood	Front (metres)	Rear (metres)	Side (metres)
Elgon View	12.58	7.26	7.33
Kimumu	9.81	3.64	4.22
Munyaka	5.59	1.37	1.20
Total	9.08	3.74	3.96

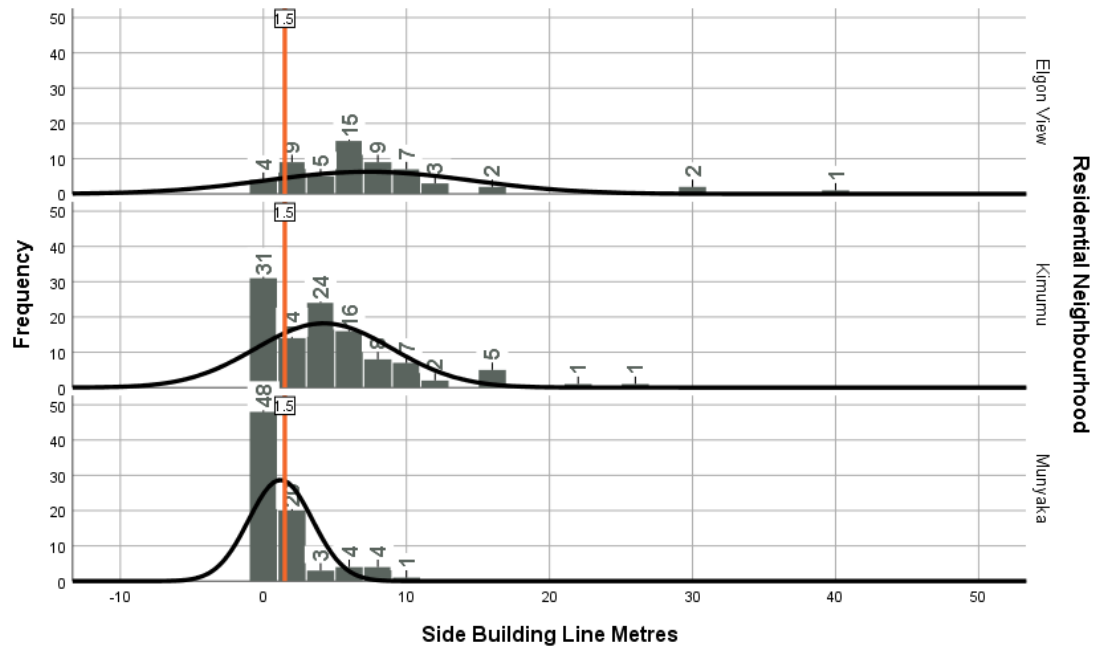
Figure 4.26 to 4.28 presents histograms illustrating observations for front, side and rear building lines for the three residential neighbourhoods.

From Figure 4.20, it is evident that Munyaka has a higher number of dwelling units ( $n=29$ ) with a frontage of less than 2.5 metres as shown by the golden vertical line on the histogram. This is followed by Kimumu ( $n=16$ ) and Elgon View with the least ( $n=1$ ). With a mean of 9.08 metres frontage, 46 out of 246 outcomes were non-compliant translating to 18.7% non-compliant and 81.3% compliant.



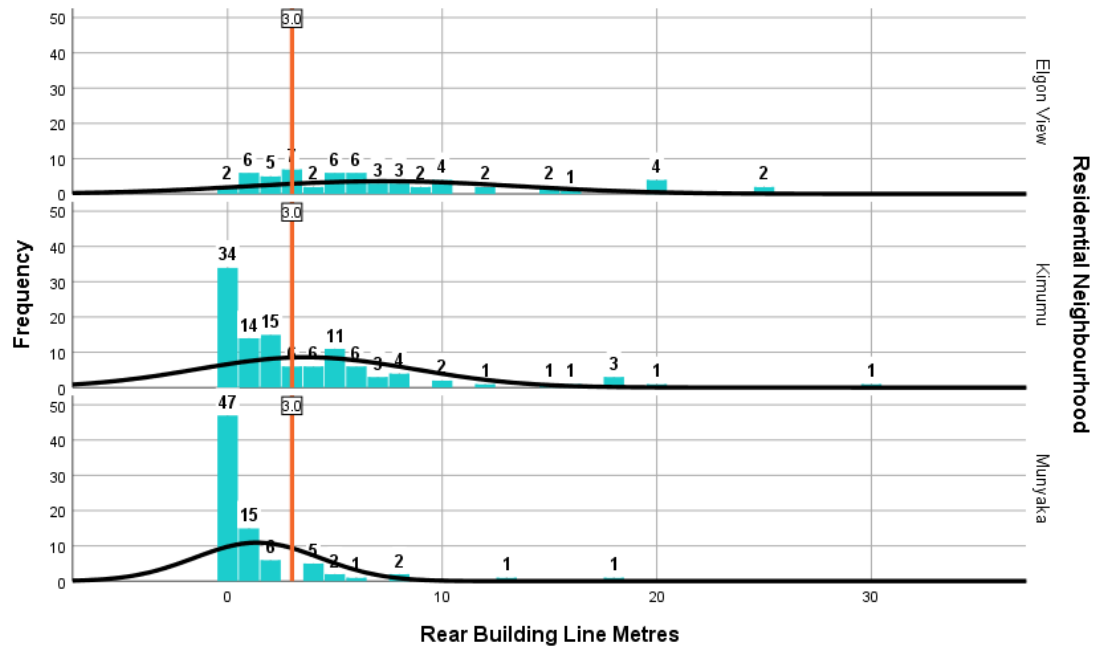
**Figure 4.26 Front Building Lines**

Figure 4.28 is a histogram illustrating the observations for side building lines across the three residential neighbourhoods. From the figure, it is evident that Munyaka had the highest number of dwelling units  $n=48$  with a side building line of less than 1.5 metres as shown by the vertical golden line on the histogram. Kimumu follows with  $n=31$  dwelling units below the 1.5-metre mark and Elgon View has the least  $n=4$  dwelling units that are not compliant to the 1.5 metres side line standard. With a mean side setback of 3.96 metres, 83 out of 246 sampled households were non-compliant that is, below 1.5 metres translating to 33.7% non-compliant and 66.3% compliant.



**Figure 4.27 Side Building Lines**

Figure 4.29 presents a histogram illustrating the observations for rear building line for the three residential neighbourhoods. From the figure, it can be seen that Elgon View neighbourhood has done better in observing this planning standard compared to Kimumu and Munyaka. The graph depicts a higher number of dwelling units below the 3-metre planning standard (the golden vertical line on the graph) for Kimumu and Munyaka compared to Elgon View. With a mean rear setback of 3.74 metres, 157 outcomes out of 246 were below the 3-metre setback translating to 68.8% non-compliant and 36.2% compliant across the sampled residential neighbourhoods.



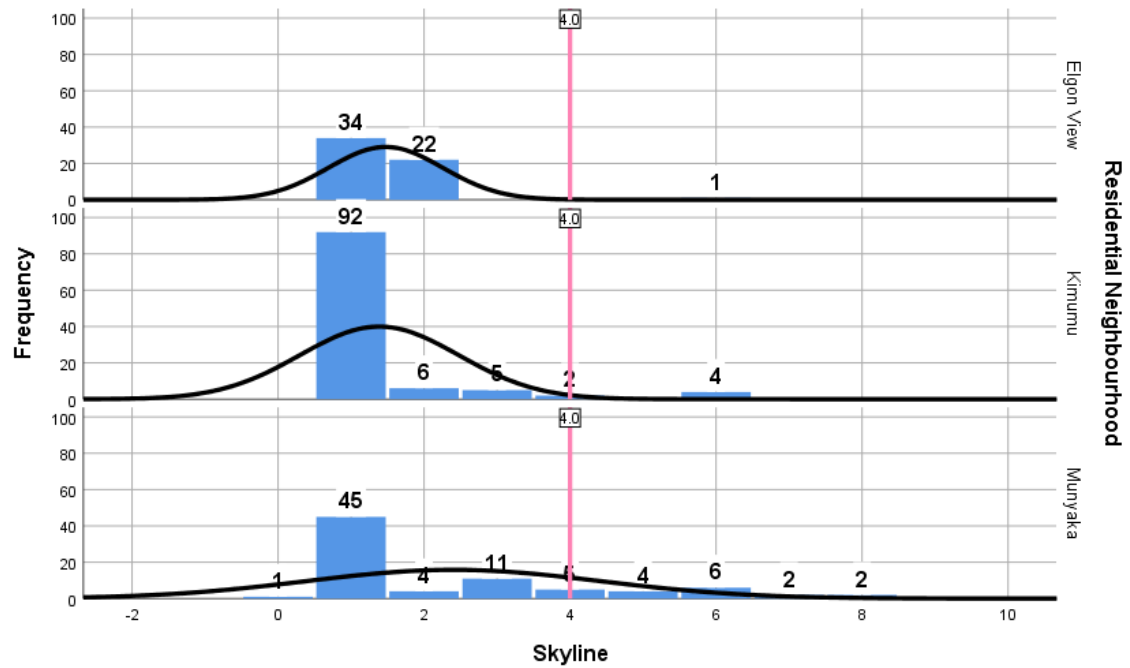
**Figure 4.28 Rear Building Line**

Table 4.32 shows the mean plot size, skyline and an average number of dwelling units per plot across the three residential neighbourhoods. The mean plot sizes for Elgon View, Kimumu and Munyaka were hectares, 0.34430, 0.30619 and 0.19577 respectively. This led to a total mean plot size of 0.29434. The mean number of dwelling units per plot was 2.16, 5.64 and 6.19 for Elgon View, Kimumu and Munyaka respectively. This led to a mean total number of dwelling units to 5.01. The mean skyline was 1.47, 1.39 and 2.016 for Elgon View, Kimumu and Munyaka respectively. Where it translated to a total mean skyline of 1.47. There is total compliance to the plot size and skyline regulation for low medium and high-density residential neighbourhoods. Uasin Gishu County Land Use Regulation Framework of 2014 to 2017, (2014) provides for a minimum lot size of 0.045 ha for high-density neighbourhoods and 0.2ha for low and medium-density neighbourhoods which have been adhered to.

**Table 4.32 Mean Plot Size, Skyline and Number of Dwelling Units**

<b>Residential Neighbourhood</b>	<b>Plot Size (ha)</b>	<b>Number of Dwelling Units</b>	<b>Skyline</b>
Elgon View	0.34430	2.16	1.47
Kimumu	0.30619	5.64	1.39
Munyaka	0.19577	6.19	2.40
Total	0.29434	5.01	1.74

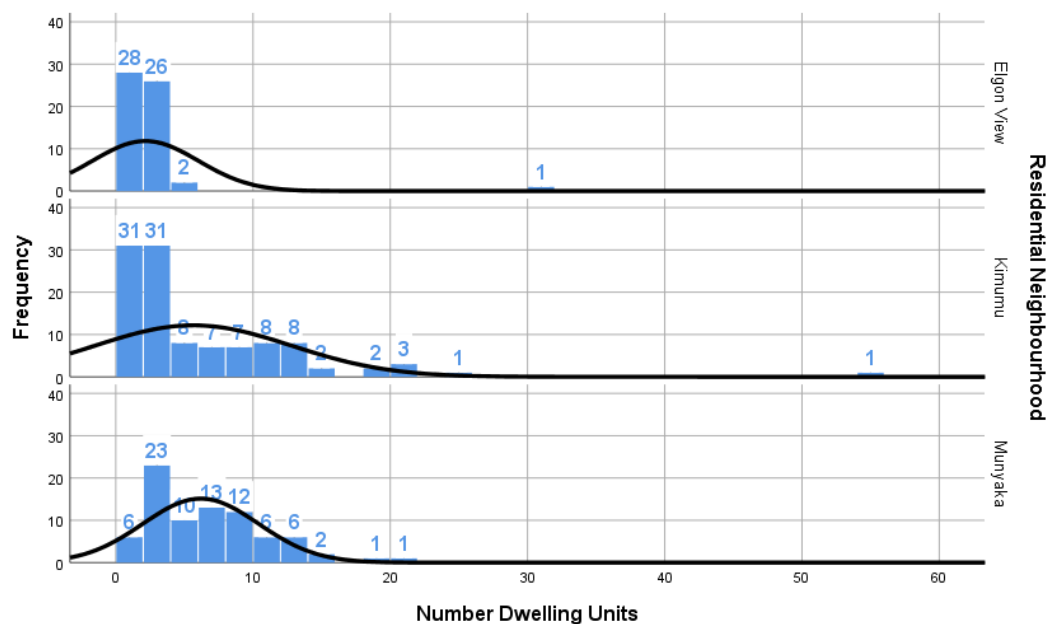
The histogram in Figure 4.29 illustrates the skylines for the dwelling units in the three residential neighbourhoods where the maximum skyline for the low-density residential neighbourhood (Elgon View), medium density residential neighbourhood (Kimumu) and high-density residential neighbourhood (Munyaka) as per the Uasin Gishu County Land Use Regulation Framework of 2014 to 2017, (2014) is 4 levels. From the study most development in the three neighbourhoods that is Elgon View, Kimumu and Munyaka were below the skyline limit of (4) levels as shown by the vertical pink line in Figure 4.23. However, Munyaka the highest instances (20) of violation of this regulation compared to Kimumu (4) and Elgon View (1) bringing compliance in the three neighbourhoods to 89.84% and 10.16% non-compliance.



**Figure 4.29 Skyline**

Figure 4.30 presents a summary of the number of dwelling units' distribution per plot in the sampled units across the three residential neighbourhoods. From Figure 4.24, it is evident that Elgon View had the least number of dwelling units per plot evident by a histogram skewed to the left. Kimumu follows with a lesser number of dwelling units whereas Munyaka has the highest number of dwelling per plot. However, none of the residential neighbourhoods has several dwelling units higher than the recommended standard as per Physical Planning Handbook (2007). According to the handbook, a high density, medium density and low-density residential neighbourhood must not have more than 70, 65 and 50 dwelling units per hectare respectively.





**Figure 4.30 Average Observed Dwelling Units Per Plot**

Table 4.33 shows the summary of findings on the compliance to residential planning standards.

**Table 4.33 Summary Compliance to Planning Standards**

No.	Standard	% Compliance	
1.	Access road width	11.8	
2.	Plot coverage	57.72	
3.	Setbacks	Front	81.3
		Side	66.3
		Rear	36.2
4.	Plot size	100	
5.	Skyline	89.84	
6.	Number of Dwelling Units	100	

## CHAPTER FIVE

### DISCUSSIONS

#### 5.1 Overview

This chapter discusses the results for all the four objectives of this study as presented in Chapter Four. It further, demonstrates how the findings relate to other similar studies discussed in the literature review.

#### 5.2 Residential Satisfaction in Eldoret Municipality

The first objective was to determine the level of residential satisfaction across neighbourhoods. This study showed a majority of the respondents recording high levels of residential satisfaction that is 59.8% 'very satisfied' and 11% 'extremely satisfied'. According to Amérigo & Aragones (1997) and Amole (2009), the propensity of individuals becoming accustomed to their residential environment over time leads them to report high satisfaction levels. The studies postulated that as individuals continue to reside in an area, they adapt to mechanisms which improve their level of satisfaction. This is possible given that 3.75% of respondents in Munyaka and 5.5% of respondents in Kimumu stated that they resided in those neighbourhoods since birth. Despite the propensity to record high satisfaction levels in self-assessed residential satisfaction, the differences in satisfaction levels from various respondents still reflect the inadequacies in housing that need to be addressed. This differences in in satisfaction levels according to residential satisfaction theories gives an insight between household's actual and desired dwelling unit and neighbourhood conditions (Galster, 1987; Galster & Hesser, 1981)

In the same regard, this study has shown that homeownership is linked to high levels of residential satisfaction. This is in congruence with other studies that have shown homeowners consistently recording high degree of satisfaction with their homes,

neighbourhoods and their lives in general (Barcus, 2004; Galster & Hesser, 1981; Teck-Hong, 2012; Teck-Hong, 2011). It is therefore notable that house tenure in the study area could also have contributed to the high satisfaction levels recorded by this study given that 61.38% of the respondents were homeowners. Barcus (2004) and Kaitilla, (1993), found out that even with comparable quality of housing, homeowners are more likely to be satisfied than renters. This was associated with a sense of 'self-gratification' homeowners get from their housing, making them expressively proud and satisfied.

Mohit & Raja, (2014) further elaborate that a higher satisfaction from among homeowners stating that renters have a smaller amount of control over their residential environment and hence reside in lower housing quality with little power to intervene in their housing quality. Homeowners, on the other hand, having the privilege of freehold properties, they conform and live in their current homes longer hence are most likely to be connected with their neighbours and to take part in activities to improve local aesthetics thus leading to higher residential satisfaction (Teck-Hong, 2011).

Both the dwelling unit attributes and the neighbourhood attributes that is number of rooms, neighbourhood hygiene, general cleanliness and environmental aesthetics, rent and mortgage expenses, ventilation, Natural lighting, expenditure on transport, access to public facilities and public security accounted for the overall residential satisfaction. One reason attributed to high residential satisfaction, particularly in housing satisfaction studies is the propensity of respondents to perceive their mandate as that of protecting his or her house and the residential environment from criticism (Troy, 1973). A study conducted in Benin City showed the propensity of homeowners to defend their residential environment by recording high satisfaction levels. It is expected for housing occupants are expected to have higher levels of satisfaction with individual or private

facets of their life than outward facets. In this regard housing for most homeowners and even renters is a private facet of their life (Seik, 2000).

A household's judgement of its housing condition, according to the housing adjustment model of residential mobility, is done regarding normatively distinct norms. This is cultural norms decreed by societal standards and family and or personal norms which in turn make up a household's standard for housing (Lu, 1999). When asked whether they would recommend a friend or a relative to live in their residential environment, 93.5% of the respondents said yes. This is an indication that most of the residents perceived their residential environment to be of good quality whereby according to the housing adjustment theory, households express high levels of satisfaction with residential environment when the current residential environment meets the norms. However, in the case of poor housing conditions, dissatisfaction in housing may be reduced by improving the residential environment through remodelling or by developing alternative residential preferences to reduce discontent (Bruin & Cook, 1997).

Elgon View neighbourhood, low density neighbourhood had exhibited higher satisfaction levels where most of the respondents were in the 'very satisfied' 66.67% and 'extremely satisfied' 26.32% categories compared to Kimumu and Munyaka medium density and low-density neighbourhood which had only 10.09% and 1.25% respondents in the 'extremely satisfied' respectively. In comparison low-density residential neighbourhoods are associated with high quality and property values which lead to high residential satisfaction as opposed to high-density residential neighbourhoods (Abidin et al., 2019; Jaafar & Hasan, 2005). This could explain why satisfaction varied with Elgon View expressing the highest residential satisfaction followed by Kimumu and Munyaka with the least residential satisfaction levels. Low-density residential environments are always associated with higher prices which is an indicator of better

homes (Teck-Hong, 2011). On the other hand, the different satisfaction level in the low, medium and high-density residential area suggests that many residents have a negative feeling towards high-density residential areas as they view them as unattractive (Senior et al., 2004).

The significance of perceptual variables in assessing household's residential satisfaction cannot be overstated. It has been postulated that the objective measures of the residential environment alone are not enough to give a satisfactory account of residential satisfaction. Empirical finding in residential satisfaction shows that different individuals assess residential environments in their way depending on their own unique residential needs (Fried & Gleicher, 1961; Lu, 1999; Teck-Hong, 2011). As evident in Figure 4.13, residents in Elgon View, Kimumu and Munyaka had each their own unique set of reasons for choosing to live in their residential environment. As such this could also have led to the high residential satisfaction indices in the study area given the diverse neighbourhoods that offer housing options according to the household's needs. Residents in Elgon View (64.91%) were mainly attracted by the environmental serenity the neighbourhood provided. Residents in Kimumu were attracted mainly by homeownership (32.11%), environmental serenity (22.02%) and proximity to work (16.51%). In Munyaka, residents had fairly evenly distributed reasons for residing in the neighbourhood with the major ones being environmental serenity (25%), proximity to work 22.5%, friendly neighbours 16.25% and availability of dwelling units (12.5%).

Nonetheless, residential satisfaction as a measure of residential conditions has not gone without criticism. Consistently high satisfaction indices often recorded by studies on residential satisfaction may not reflect real situations on the ground (Francescato et al., 1986; Ogu, 2002). The basis behind this argument is that the lesser the respondent's awareness of better options, the higher the level of satisfaction hence residential

satisfaction is believed to be a prejudiced assessment. However, despite pointing out the limitations of residential satisfaction technique, Francescato et al., (1987), admitted that they were not enough to outweigh the significance of residential satisfaction as a measure of residential environment quality. Despite the propensity to record high satisfaction indices in self-assessed residential satisfaction, the differences in satisfaction indices from various respondents still reflect the inadequacies in housing that need to be addressed. This differences in satisfaction indices according to residential satisfaction theories gives an insight between a household's current and desired dwelling unit and neighbourhood conditions (Galster, 1987; Galster & Hesser, 1981).

### **5.3 Relationship between selected housing attributes and residential satisfaction**

As shown earlier in Section 2.3 housing attributes consists of dwelling unit features and neighbourhood features (Byun & Ha, 2016; Mohit et al., 2010; Teck-Hong, 2012). In this study, dwelling unit features included the environmental aesthetics, distance to schools (primary and secondary), distance to the workplace, distance to a healthcare facility, neighbourhood hygiene, number of bedrooms in the dwelling unit, public security, expenditure on transport, rent and mortgages expenses. Ordinal logistic regression was conducted with these attributes to understand how they influence residential housing satisfaction.

Findings in the final model indicate that neighbourhood hygiene, public security, number of rooms in a dwelling unit and environmental aesthetics were significant positive predictors of residential satisfaction. On the other hand, distance to schools both primary and secondary, workplace, healthcare facility, rent and mortgage expenses, expenditure on transport were negatively non-significant predictor of residential satisfaction with extremely low estimates.

This implies that a higher number of bedrooms, neighbourhood hygiene, public security and environmental aesthetics had a significant positive impact on residential satisfaction. As such residents with adequate space in terms of number of bedrooms in housing tend to be more satisfied with their housing as opposed to those with fewer rooms in the house. This is in agreement with other studies including Mohit et al. (2010) and Teck-Hong, (2011) who stated that the more space a household has, the more they are likely to be satisfied. Morris & Winter (1978) and Liu (2005) further demonstrates the importance of space to satisfaction stating it to be a major consideration to households buying or renting housing as echoed in the Universal Declaration of Human Right and the International Covenant on Economic and Cultural Rights definition of adequate housing (Majale et al. 2012). In terms of planning for space in housing, the UN-Habitat recommends that no more than three people may share a sleeping room (United Nations, 2008).

Comparing the demographics to the number of bedrooms, it was evident that the residents had ample space given that the average household size was 4.24 against the average number of bedrooms of 3.1 meet the UN-habitat standard for adequate housing. Neighbourhood hygiene and environmental aesthetics was another factor that had a significant positive effect on residential satisfaction. Respondents who reported a higher level of neighbourhood hygiene and environmental aesthetics had a higher probability of being satisfied with their housing. It was therefore demonstrated that hygiene was fundamental in ensuring that residents are satisfied with their residence. These findings are parallel to studies conducted by Baum et al. (2010), Hipp (2010) and Teck-Hong (2012) where their findings showed that other services offered by housing developers such as solid waste management, public security, brightness and ventilation of housing had a positive impact on residential fulfilment. Similar to the findings in this study,

research conducted by Mohit et al. (2010) also recorded that public security significantly influenced residential satisfaction.

Expenditure on transport was a significant negative predictor of residential satisfaction as seen in Table 4.12. This is because expenditure on transport increases the household budget which very few can afford. A larger percentage (34%) of the residents belong to the low-income group of below Kshs. 10,000 a month. An increase in transportation cost increases household expenditure thus influence satisfaction negatively (CNT, 2019; Litman, 2018; Smart Growth America, 2019; Zillow, 2014). Distance to schools, workplace, healthcare facility and rent and mortgage costs were non-significant negative predictors of residential satisfaction.

These results are similar to the findings in Teck-Hong, (2012). In this study, it was determined that based on location attributes, residents are less satisfied as the distance to workplace increase. Further, the study showed that distance healthcare facility was insignificantly related to residential satisfaction. In contrast to this study, Lu (1999) found that as the dwelling unit cost increased, the more satisfied the residents were since a higher price is associated with quality. In this study, having an opposite effect on residential satisfaction, the findings were insignificant. It, therefore, insinuates that the high cost of housing will make it unaffordable hence causing low residential satisfaction. In terms of distance to schools, the neighbourhood concept describes a liveable neighbourhood is the one that has access to school for residents within 0.8 Km. With reference to this, one can thus associate a long distance to schools with reduced residential satisfaction.



#### **5.4 The relationship between selected household socio-economic characteristics and residential satisfaction**

Findings, as presented in Section 4.4, showed that marital status, income, employment and house ownership were significant positive predictors of residential satisfaction. Age was a negative significant determinant of residential satisfaction while the household size and level of education were a non-significant negative predictor of residential satisfaction.

This means being married increases the probability of being satisfied with one's residential housing just as increased income, being employed and owning a house. On the other hand, age, household size and level of education increases, residential satisfaction decreases. These findings are supported by those of Abdu et al. (2014), Jaafar & Hasan (2005), Salleh, (2008) and Teck-Hong, (2012). A household with a higher income, employed household heads and those who owned their homes had a higher level of residential satisfaction due to high exposable incomes to access good quality housing. Further, Lu (1999) put forward one parented household have a low probability of expressing high levels of residential satisfaction than two parented households due to the limited resources single parented household have limited their choice of housing. As age, level of education and household size increased the less likely the respondents were satisfied with their housing. A study by Mohit et al. (2010) demonstrated that age is negatively correlated to residential satisfaction. This can be attributed to the increase in the family size as the age of household head increases. From the findings, the mean age 44 years which is the age where most people have responsibilities of raising a family. According to Liu (2005), the presence of children in a household increases housing cost burden hence low satisfaction.

Household size and level of education, though not significant in this study, have been reported to impact on residential satisfaction. Household size for instance impacts on the amount of space available for household members. Overcrowding of individuals in a house may cause negative effects on individuals thus low residential satisfaction (Liu, 2005). Further, Morris & Winter (1978), associated small family with high satisfaction. Adriaanse (2007) reported higher-income households are largely satisfied with their housing. Liu (2005) explains linking housing quality directly to income such that, income dictates housing tenure, affordability and that with a higher income, one is likely to secure a better home hence satisfaction level. In the same regard so does employment correlate with residential satisfaction. Similar to these findings, a study by Lu (1999) showed that the level of education was found to have an insignificant impact on residential satisfaction. However, though the relationship was insignificant, the correlation was negative meaning the more educated household heads were less likely to be satisfied compared to the less educated household heads. According to Ogu (2002), this is due to the tendency of more educated residents having greater anticipations of housing and environmental attributes with regards to policy expectation to remedy residential inadequacies. Homeownership was a significant positive determinant of residential satisfaction. The findings showed a that household heads who owned their houses had a higher degree of residential fulfilment compared to those who rented. Liu (2005) and Teck-Hong (2012) reported similar results in their study on residential satisfaction. It has been reported that homeownership creates a feeling of general well-being. This is since it generates a feeling of permanency, a psychological sense of self-gratification and economic investment in the residential neighbourhood (Kaitilla, 1993; White et al., 1993). According to a study conducted in Benin city Nigeria, with the identical quality of housing environment, homeowners are highly contented with

housing than renters (Ogu, 2002). One possible explanation to low satisfaction among renters as opposed to homeowners is that renters have little control over the residential environment resulting in a low housing quality (Loo, 1986).

### **5.5 Compliance to selected residential planning standards**

Residential housing planning standards are stipulated at the plot and neighbourhood levels. At the plot level, the standard governs plot setting (includes plot size, developed percentage of the plot, building lines, setbacks and building height) and permitted structure types such as flats, row housing, bungalow and maisonette, while at the neighbourhood level, it governs road width, provision of public utility space, solid waste disposal and sewerage disposal and the number of dwelling units per plots (Physical Planning Handbook 2007; Liu, 2005).

Compliance to access road width was lowest, followed plot coverage compliance, building line compliance and skyline compliance. All the three neighbourhoods had complied to the acceptable number of dwelling units per plot. According to the physical planning handbook standards, the minimum access road width for residential areas is 9 metres. The findings of the study showed instances both compliance and non-compliance across the three residential neighbourhoods that is Elgon View, Kimumu and Munyaka. The mean access road width was less than the recommended nine metres which is an indication that most of the access roads in these neighbourhoods have not complied to set standards. An analysis of variance using one-way ANOVA revealed that while access road width in Elgon view significantly differed from that of Kimumu and Munyaka, the difference in access road width was not significant in Kimumu and Munyaka as presented in Table 4.29 and Figure 4.16. This shows that the compliance to the access road width in Kimumu and Munyaka was similar.

Different plot coverage standards have been set according to the various residential neighbourhoods that are low density at 50%, medium density at 65% and high-density at 70%. The study findings showed some of the residential neighbourhood in violation of the set standard for plot coverage (see Table 3.4). According to the bid rent theory, land closer to the Central Business District (CBD) commands higher rents hence high demand. This makes the land to be put on intensive use to maximize the gains. This could have led to the violation of the plot coverage planning as landowners strive to put the land on maximum use as the three residential neighbourhoods are within the Municipality. Further, population increase in the Municipality could have a major influence on the increased plot coverage due to the need for more housing for the burgeoning population.

Building lines in any residential neighbourhood development are meant to ease congestion, ensure accessibility, allow for proper lighting and ventilation (*Physical Planning Handbook, 2007*). The standard building lines for residential areas are side 1.5 metres, rear 3 metres and front 2.5 metres. As much as compliance to these standards was recorded as indicated section 4.5 in issues of non-compliance were also evident. Similar to the discussion on plot coverage standard, the bid rent theory on how price and demand for residential space vary as the distance from the CBD increases could be used to explain why building line standards were violated where the landowner a faced with the dilemma of maximize profit on land and obeying planning standards.

The mean plot size across the neighbourhoods was 0.29 acres. However, nearly all the plot sizes in Munyaka were divided to minimum acceptable standard compared to Elgon view and Kimumu with the mean plot size of 0.196 acres. The minimum lot size for the residential neighbourhood is one-eighth of an acre (*Physical Planning Handbook, 2007*).

At a mean skyline of 1.47 meaning most of the housing developments in these neighbourhoods were developed up to one level, housing developments in the study sites were compliant. The stipulated maximum skyline for low and medium density residential neighbourhoods is a 3 and 6 respectively (*Physical Planning Handbook*, 2007). This finding is confirmed by the finding that most of the housing types in these neighbourhoods were row housing and bungalow as presented in Section 4.3.1

Comparing the fact that the mean number of dwelling units per plot across the three residential neighbourhoods was 5 dwelling units per plot with Physical Planning Standards of Kenya suggests that is total compliance to the dwelling units per plot standard. Specifically, the low-density residential neighbourhood of Elgon View had a higher level of compliance compared to the medium and high-density residential neighbourhoods of Kimumu and Munyaka. To explain these findings, Ngetich et al. (2014) findings on development control regulations that associated compliance to planning standards with various factors including making the most out of available space, costly professional and administration fees, corruption, poverty, ignorance, poor enforcement and complexity of development process. Similarly, this study recorded cases of unemployment, lack of formal education and a high percentage of low-income groups from among the respondents as noted in section 4.4. It possible that these factors could have influenced to some extent, the non-compliance to planning standards.

## CHAPTER SIX

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

#### 6.1 Introduction

This Chapter provides a recap of the study's findings and draws conclusions and recommendations in line with the research objectives and study problem.

#### 6.2 Summary of findings

In objective one, it was found that there was a moderately high level of residential satisfaction in Eldoret Municipality. These residential satisfaction levels were found to differ across neighbourhoods with low-density neighbourhoods having the highest levels of residential satisfaction and high-density neighbourhood having the lowest satisfaction levels.

In Objective two, neighbourhood hygiene, public security, number of rooms in a dwelling unit and environmental aesthetics were found to be significant influencers of residential satisfaction. Distance to schools both primary and secondary, distance to work, distance to a healthcare facility, rent and mortgage expenses were non-significant impactors of residential satisfaction.

In objective three, age, marital status, employment, income and house tenure were significant determinants of residential satisfaction. Household size and level of education were non-significant impactors of residential satisfaction.

In objective four, there was 100% compliance to plot size and number of dwelling units per lot planning standard. Access road width, plot coverage and skyline, there was 11.8%, 57.72% and 89.84% compliance respectively. Building line compliance that is front, side and rear had 81.3%, 66.3% and 36.2% compliance respectively.

### **6.3 Conclusions**

This study concludes that reducing the number of dwelling units in a neighbourhood, improving neighbourhood hygiene, improving public security in a residential neighbourhood, increasing the number of rooms available to housing occupants and improving environmental aesthetics increases residential satisfaction. Further, age, marital status, employment, income and house tenure impacts residential satisfaction such that home owners tend to be more satisfied with their houses as compared to tenants. With similar housing conditions, older individuals are less likely to be satisfied than the younger. Households with married couples, residents with employment and higher incomes have a higher probability of being satisfied with the residential environment. It was also determined that promoting homeownership as opposed to tenancy, they will most certainly improve residential satisfaction. It was finally noted that compliance to planning standards impacts on the residential quality which in turn affects residential satisfaction.

### **6.4 Recommendations**

Arising from key findings and conclusions, the following recommendations are made.

- a) Planning and designing housing areas that people can afford and has attributes of livability aesthetics, space requirements in areas where they derive their livelihood and services and fulfil their dreams or housing needs. To achieve this the planning to borrow from the modern-day planning concepts such as new urbanism and smart growth
- b) Built housing that takes into consideration the socio-economic conditions of the people and protecting the low-income houses from being raided by middle-income groups

- c) Promote homeownership in government housing schemes such as the big four agenda as home ownership results to high levels of residential satisfaction
- d) Planning for the residential neighbourhood should put in place mechanisms that will promote public security, environmental aesthetics and neighbourhood hygiene such as waste management mechanisms
- e) Develop a policy for housing that considers the diverse needs of housing in Eldoret municipality that is depending on the age, household size, house costs that is rent and mortgages, marital status, employment and income

Figure 6.1 illustrates the existing situation.



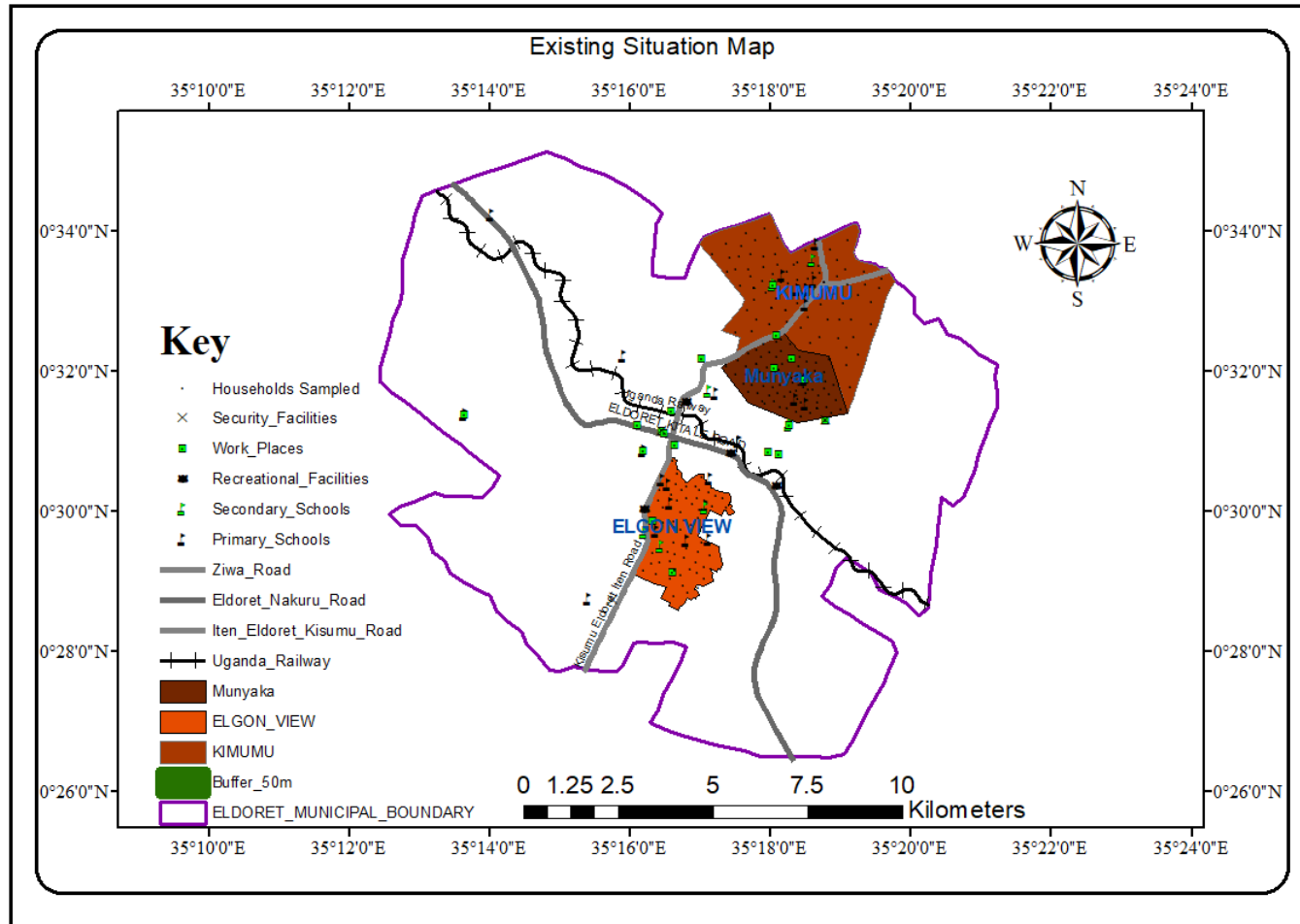
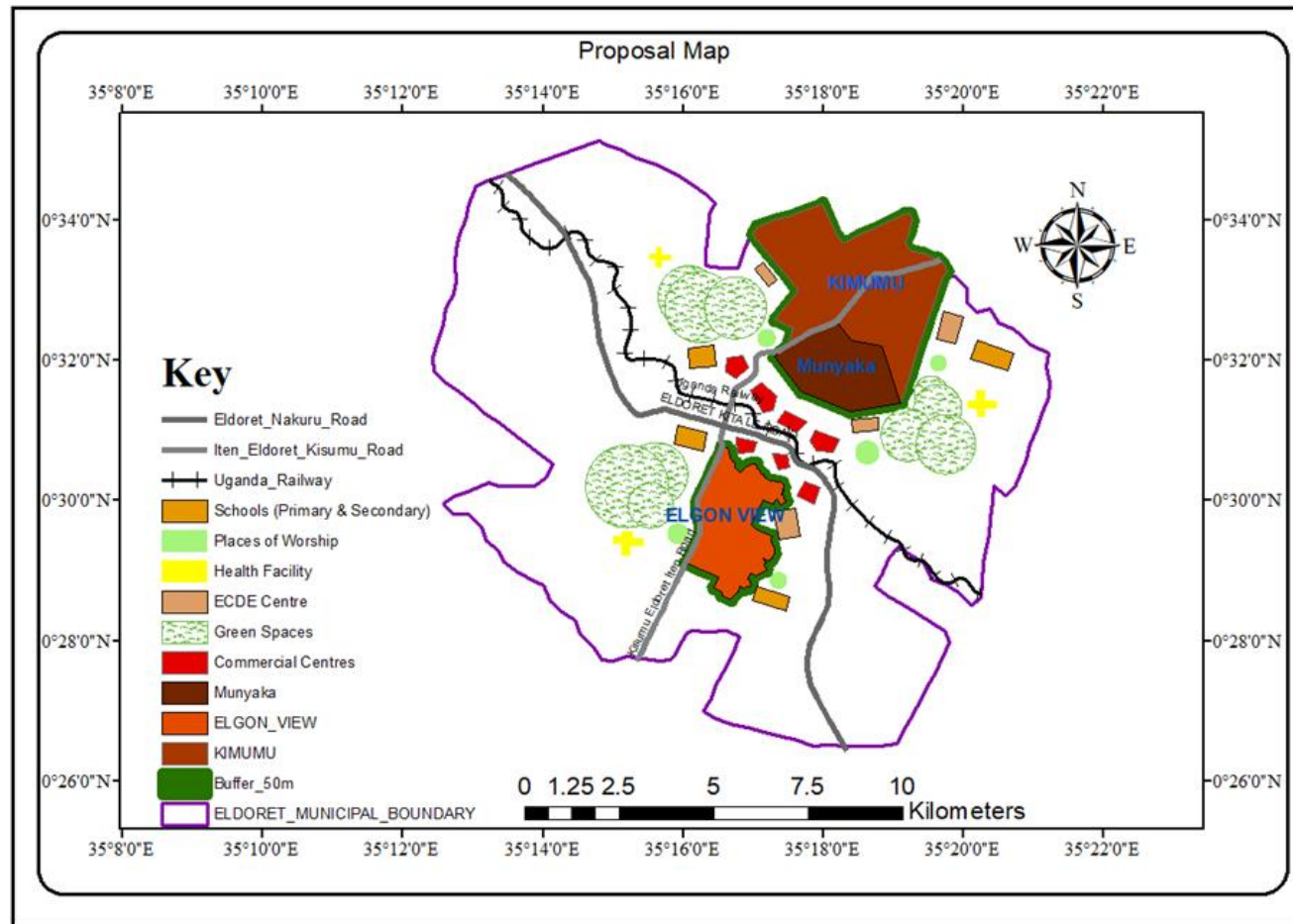


Figure 6.1 Existing Situation Map

(Source: Author, 2020)

Figure 6.2 shows proposals on developing residential areas



**Figure 6.2 Proposal Plan in one of the Neighbourhoods.**

(Source: Author, 2020)

## REFERENCES

- Abdu, A., Hashim, A. H., Samah, A. A., & Salim, A. S. S. (2014). Relationship between background characteristics and residential satisfaction of young households in unplanned neighbourhoods in Kano, Nigeria. *IOSR Journal Of Humanities and Social Science (IOSR-JHSS)*, 19(10), 138–145.
- Abidin, N. Z., Abdullah, M. I., Basrah, N., & Alias, M. N. (2019). Residential Satisfaction: *Literature Review and A Conceptual Framework*. *IOP Conference Series: Earth and Environmental Science*, 385, 012040. <https://doi.org/10.1088/1755-1315/385/1/012040>
- Adriaanse, C. (2007). Measuring residential satisfaction: A residential environmental satisfaction scale (RESS). *Journal of Housing and the Built Environment*, 22(3), 287.
- Aigbavboa, C., & Thwala, W. (2018). *Residential Satisfaction and Housing Policy Evolution*. CRC Press.
- Amérgo, M., & Aragonés, J. I. (1997). A theoretical and methodological approach to the study of residential satisfaction. *Journal of environmental psychology*, 17(1), 47-57.
- Amnesty International. (2009). *Kenya: The Unseen Majority: Nairobi's Two Million Slum-Dwellers*.
- Amole, D. (2009). Residential satisfaction in students' housing. *Journal of Environmental Psychology*, 29(1), 76-85.
- Ariffin, R. N. R., Nadarajah, S., & Zahari, R. K. (2010). *Residential satisfaction in private low-cost housing in the urban area: A case study of the Klang Valley, Malaysia*.

- Arimah, B. C. (1992). Hedonic prices and the demand for housing attributes in a third world city: The case of Ibadan, Nigeria. *Urban Studies*, 29(5), 639–651.
- Awotona, A. (1988). The perception of housing conditions in Nigeria by the urban poor. *Habitat International*, 12(2), 75–96.
- Awotona, A. (1990). Nigerian government participation in housing: 1970–1980. *Habitat International*, 14(1), 17–40.
- Barcus, H. (2004). Urban-rural migration in the USA: An analysis of residential satisfaction. *Regional Studies*, 38(6), 643–657.
- Baum, S., Arthurson, K., & Rickson, K. (2010). Happy people in mixed-up places: The association between the degree and type of local socioeconomic mix and expressions of neighbourhood satisfaction. *Urban Studies*, 47(3), 467–485.
- Bechtel, R. B., & Bechtel, R. B. (1997). *Environment and behavior: An introduction*. Sage.
- Bohl, C. C. (2000). *New urbanism and the city: Potential applications and implications for distressed inner-city neighborhoods*.
- Bruin, M. J., & Cook, C. C. (1997). Understanding constraints and residential satisfaction among low-income single-parent families. *Environment and Behavior*, 29(4), 532–553.
- Burchell, R. W., Listokin, D., & Galley, C. C. (2000). Smart growth: More than a ghost of urban policy past, less than a bold new horizon. *Housing Policy Debate*, 11(4), 821–879.
- Byun, G., & Ha, M. (2016). The factors influencing residential satisfaction by public rental housing type. *Journal of Asian Architecture and Building Engineering*, 15(3), 535–542.

- Cheserek, G. J., & Opata, G. P. (2011). Environmental and housing problems of low-income households in Eldoret Municipality, Kenya. *Journal of Emerging Trends in Economics and Management Sciences*, 2(4), 320-324.
- Chapman, D. W., & Lombard, J. R. (2006). Determinants of neighborhood satisfaction in fee-based gated and nongated communities. *Urban Affairs Review*, 41(6), 769-799.
- Choguill, C. L. (2008). Developing sustainable neighbourhoods. *Habitat International*, 32(1), 41-48.
- Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. *Performance Improvement*, 56(10), 15-23.
- CNT. (2019). *The H+T Affordability Index*. <https://htaindex.cnt.org/>
- County Government Act, 2012
- County Land Use Regulation Framework (2014-2017)*, (2014) (testimony of County Land Use Regulation Framework (2014-2017) County Government of Uasin Gishu).
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.
- Croasmun, J. T., & Ostrom, L. (2011). Using Likert-Type Scales in the Social Sciences. *Journal of Adult Education*, 40(1), 19-22.
- Dissanayake, L. (1987). *Effectiveness of the development control system for the City of Colombo, Sri Lanka*. Development Planning Unit, University College, London.
- Doeringer, P., Terkla, D., & Topakian, G. (1987). *Invisible Factors in Local Economic Development New York: Oxford University Press*.

- Elsinga, M., & Hoekstra, J. (2005). Homeownership and housing satisfaction. *Journal of Housing and the Built Environment*, 20(4), 401–424.
- United States. Environmental Protection Agency. Office of Wastewater Management. Municipal Support Division, National Risk Management Research Laboratory (US). Technology Transfer, & Support Division. (2004). *Guidelines for water reuse*. US Environmental Protection Agency.
- Erdogan, N., Akyol, A., Ataman, B., & Dokmeci, V. (2007). Comparison of urban housing satisfaction in modern and traditional neighborhoods in Edirne, Turkey. *Social Indicators Research*, 81(1), 127–148.
- Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics*. SAGE Publications. <https://books.google.co.ke/books?id=JIrutAEACAAJ>
- Field, Andy. (2009). *Discovering Statistics Using SPSS*. SAGE Publications.
- Fischer, G., & Wefer, G. (1991). Sampling, preparation and analysis of marine particulate matter. *Washington DC American Geophysical Union Geophysical Monograph Series*, 63, 391-397.
- Foote, N. N. (1960). *Housing choices and housing constraints*. McGraw-Hill.
- Francescato, G., Weidemann, S., & Anderson, J. R. (1987). Residential satisfaction: Its uses and limitations in housing research. *Housing and Neighbourhood: Theoretical and Empirical Contributions*, 43–57.
- Francescato, M., Tonini, G., Radillo, O., Giorda, G., & Cok, P. (1986). Studio sulle caratteristiche dell'alimentazione libera di un gruppo di giovani soggetti diabetici. *Riv. It. Ped*, 12, 384–389.
- Frank, B., & Enkawa, T. (2009). Economic drivers of dwelling satisfaction. *International Journal of Housing Markets and Analysis*.

- Fried, M., & Gleicher, P. (1961). Some sources of residential satisfaction in an urban slum. *Journal of the American Institute of planners*, 27(4), 305-315.
- Galster, G. (1987). Identifying the correlates of dwelling satisfaction: An empirical critique. *Environment and Behavior*, 19(5), 539–568.
- Galster, G. C. (1985). Evaluating indicators for housing policy: Residential satisfaction vs marginal improvement priorities. *Social Indicators Research*, 16(4), 415–448. <https://doi.org/10.1007/BF00333289>
- Galster, G., & Hesser, G. (1981). Residential satisfaction: Contextual and compositional correlates. *Environment and Behavior*, 16(11), 737–758.
- Gatabaki-Kamau, R., & Karirah-Gitau, S. (2004). Actors and interests: The development of an informal settlement in Nairobi, Kenya. *Reconsidering Informality: Perspectives from Urban Africa*, 158–175.
- Gifford, R. (2014). Environmental psychology matters. *Annual Review of Psychology*, 65, 541–579.
- Günther, H. (2009). The environmental psychology of research. *Journal of Environmental Psychology*, 29(3), 358–365.
- Habitat, U. (2013). *State of the world's cities 2012/2013: Prosperity of cities*. Routledge.
- Hakijamii. (2012). *Assessment of the Realization of the Right to Housing in Kenya 2011-2012*.
- Hipp, J. (2010). What is the ‘neighbourhood’ in neighbourhood satisfaction? Comparing the effects of structural characteristics measured at the micro-neighbourhood and tract levels. *Urban Studies*, 47(12), 2517–2536.
- Iravani, H., & Rao, V. (2020). The effects of New Urbanism on public health. *Journal of Urban Design*, 25(2), 218–235. <https://doi.org/10.1080/13574809.2018.1554997>

- Jaafar, M., & Hasan, N. L. (2005). The determinants of housing satisfaction level: A study on residential development project by Penang Development Corporation (PDC). *Jurnal Kemanusiaan*, 3(2).
- Jiboye, A. D. (2014). Significance of house-type as a determinant of residential quality in Osogbo, Southwest Nigeria. *Frontiers of Architectural Research*, 3(1), 20–27. <https://doi.org/10.1016/j.foar.2013.11.006>
- Kaitilla, S. (1993). Satisfaction with public housing in Papua New Guinea: The case of West Taraka housing scheme. *Environment and Behavior*, 25(3), 514–545.
- Kanazawa, M. (2017). *Research Methods for Environmental Studies: A Social Science Approach*. Routledge.
- KNBS. (2019, November 4). 2019 Kenya Population and Housing Census Results. *Kenya National Bureau of Statistics*. <https://www.knbs.or.ke/?p=5621>
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*.
- Li Yizhen. (2014). The research of all types of affordable housing satisfaction research. *Special Zone Economy*, 10, 27-30
- Litman, T. (2018). Why and How to Increase Affordable Housing in Accessible Neighborhoods. *Victoria Transport Policy Institute*, 92.
- Liu, D. (2005). *Factors affecting housing satisfaction of Asian and Pacific Islander households in the United States*.
- Loo, C. (1986). Neighborhood satisfaction and safety: A study of a low-income ethnic area. *Environment and Behavior*, 18(1), 109–131.
- Lu, M. (1999). Determinants of residential satisfaction: Ordered logit vs. Regression models. *Growth and Change*, 30(2), 264–287.
- Majale, M., Acioly Jr, C., French, M., Lalande, C., & Daltrop, E. (2012). *Enabling shelter strategies: Design and implementation guide for policymakers*.



- Makinde, O. O. (2014). Housing delivery system, need and demand. *Environment, Development and Sustainability*, 16(1), 49–69. <https://doi.org/10.1007/s10668-013-9474-9>
- Mccrea, R., Stimson, R., & Western, J. (2005). Testing a moderated model of satisfaction with urban living using data for Brisbane-South East Queensland, Australia. *Social Indicators Research*, 72(2), 121–152.
- McLeod, S. A. (2019). *Likert scale*. *Simply Psychology*. <https://www.simplypsychology.org/likert-scale.html>
- Menard, S. (2002). *Applied logistic regression analysis* (Vol. 106). Sage.
- Mohit, M. A., Ibrahim, M., & Rashid, Y. R. (2010). Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia. *Habitat International*, 34(1), 18–27.
- Mohit, M., & Raja, A. M. M. A.-K. (2014). Residential satisfaction-Concept, theories and empirical studies. *Planning Malaysia*, 12, 47–66. <https://doi.org/10.21837/pmjournal.v12.i3.131>
- Morris, E. W., Crull, S. R., & Winter, M. (1976). Housing norms, housing satisfaction and the propensity to move. *Journal of Marriage and the Family*, 309–320.
- Morris, E. W., & Winter, M. (1978). *Housing, family, and society*. John Wiley and Sons.
- Mose, V., Gachanja, J., & Osiolo, H. (2018). *Delivering Affordable Housing in Kenya Requires a Paradigm Shift*. 10, 8.
- Mulliner, E. K., & Maliene, V. (2012). *What Attributes Determine Housing Affordability*.
- Muraguri, L. (2011). Kenyan Government Initiatives in Slum Upgrading. *Les Cahiers d'Afrique de l'Est / The East African Review*, 44, 119–127.

- Mwaniki, D., Wamuchiru, E., Mwau, B., & Opiyo, R. (2015). *Urbanisation, Informality and Housing Challenge in Nairobi: A Case of Urban Governance Failure?* 21.
- Mwaura, N. (2017). Africa Rising in Kigali, Rwanda. *Sustainable Transport*, (28), 20-21.
- Mwololo, M. (2020, March 18). Brutal housing glut continues to hit developers hard.
- National Land Commission Act (2012)
- Nanda, S. (2005). The Essential Guide to Doing Research. 2004. *Social Change*, 35(4), 167–169.
- Ngetich, J. K., Mulongo, L. S., & Opata, G. P. (2014). A study on the effectiveness of urban development control instruments and practices in Eldoret Municipality, Kenya. *Journal of Emerging Trends in Engineering and Applied Sciences*, 5(2), 83–91.
- Ogu, V. (2002). Urban residential satisfaction and the planning implications in a developing world context: The example of Benin City, Nigeria. *International Planning Studies*, 7(1), 37–53.
- Oh, L. S. (2000). *Housing satisfaction of middle-income households in Bandar Baru Bangi, Selangor*.
- Olima, W. (1997). The conflicts, shortcomings, and implications of the urban land management system in Kenya. *Habitat International*, 21(3), 319–331.
- Ondieki, H. M. (2009). *Appropriate Building Technologies*. 13.
- Onibokun, A. G. (1974). Evaluating consumers' satisfaction with housing: An application of a systems approach. *Journal of the American Institute of Planners*, 40(3), 189–200.
- Osborne, Jason W. (2014). *Best Practices in Logistic Regression*. SAGE Publications.

- Osborne, J.W. (2016). *Regression & Linear Modeling: Best Practices and Modern Methods*. SAGE Publications.  
<https://books.google.co.ke/books?id=MsC2CwAAQBAJ>
- Parkes, A., Kearns, A., & Atkinson, R. (2002). What makes people dissatisfied with their neighbourhoods? *Urban Studies*, 39(13), 2413–2438.
- Peck, C. A. (1981). *Relationship between satisfaction with housing and quality of life*.
- Peck, C., & Kay Stewart, K. (1985). Satisfaction with housing and quality of life. *Home Economics Research Journal*, 13(4), 363–372.
- Physical and Land Use Planning Act 2019
- Physical Planning Handbook. (2007).
- Pinquart, M., & Burmedi, D. (2003). Correlates of residential satisfaction in adulthood and old age: A meta-analysis. *Annual Review of Gerontology and Geriatrics*, 23(1), 195–222.
- Rameli, A. (2009). *Land use planning system and housing development process in Malaysia*.
- Rent, G. S., & Rent, C. S. (1978). Low-income housing: Factors related to residential satisfaction. *Environment and Behavior*, 10(4), 459–488.
- Rickards, G., Magee, C., & Artino Jr, A. R. (2012). You can't fix by analysis what you've spoiled by design: Developing survey instruments and collecting validity evidence. *Journal of Graduate Medical Education*, 4(4), 407.
- Rossi, P. H., & Shlay, A. B. (1955county). Residential mobility and public policy issues: "Why families move" revisited. *Journal of Social Issues*, 38(3), 21-34.
- Rowley, S., Ong, R., & Haffner, M. (2015). Bridging the gap between housing stress and financial stress: The case of Australia. *Housing Studies*, 30(3), 473–490.

- Salfarina, A., Nor Malina, M., & Azrina, H. (2010). Trends, problems and needs of urban housing in Malaysia. *Malay*, 248, 62.
- Salleh, A. G. (2008). Neighbourhood factors in private low-cost housing in Malaysia. *Habitat International*, 32(4), 485–493.
- Salleh, A. G., & Badarulzaman, N. (2012). Quality of Life of Residents in Urban Neighbourhoods of Pulau Pinang, Malaysia. *Journal of Construction in Developing Countries*, 17(2).
- Satsangi, M., & Kearns, A. (1992). The use and interpretation of tenant satisfaction surveys in British social housing. *Environment and Planning C: Government and Policy*, 10(3), 317–331.
- Seik, F. T. (2000). Subjective assessment of urban quality of life in Singapore (1997–1998). *Habitat international*, 24(1), 31-49.
- Senior, M. L., Webster, C. J., & Blank, N. E. (2004). Residential preferences versus sustainable cities: Quantitative and qualitative evidence from a survey of relocating owner-occupiers. *The Town Planning Review*, 337-357.
- Shannon, R., Mant, J., Dessewffy, M., & Harrison, L. (2019). 20-Minute Neighbourhoods: Creating a More Liveable Melbourne. *Journal of Transport & Health*, 14, 100773. <https://doi.org/10.1016/j.jth.2019.100773>
- Smart Growth America. (2019). *Smart Growth America*. Smart Growth America. <https://smartgrowthamerica.org/>
- Stephanie. (2014, December 9). *Ordered Logistic Regression; Ordinal/Ordered Logit. Statistics How To*. <https://www.statisticshowto.com/ordered-logistic-regression/>
- Sullivan, G. M., & Artino Jr, A. R. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541.

- Syagga, P. (2011). *Land tenure in slum upgrading projects*.
- Teck-Hong, T. (2011). Neighborhood preferences of house buyers: The case of Klang Valley, Malaysia. *International Journal of Housing Markets and Analysis*.
- Teck-Hong, T. (2012). Housing satisfaction in medium- and high-cost housing: The case of Greater Kuala Lumpur, Malaysia. *Habitat International*, 36(1), 108–116.  
<https://doi.org/10.1016/j.habitatint.2011.06.003>
- Troy, P. (1973). Residents and their preferences: Property prices and residential quality. *Regional Studies*, 7(2), 183–192.
- Uasin Gishu CIDP. (2013). *Uasin Gishu County Integrated Development Plan 2013—2018*.
- Uasin Gishu CIDP. (2018). *Uasin Gishu County Integrated Development Plan 2018—2022*.
- Uasin Gishu County Land Use Regulation Framework (2014-2017).
- Ukoha, O. M., & Beamish, J. O. (1997). Assessment of residents' satisfaction with public housing in Abuja, Nigeria. *Habitat international*, 21(4), 445-460.
- United Nations (Ed.). (2008). *Principles and recommendations for population and housing censuses / Department of Economic and Social Affairs, Statistics Division (Rev. 2)*. United Nations Pubns.
- United Nations Centre for Human Settlements (HABITAT). (1996). *An Urbanizing World: Global Report on Human Settlements* (p. 595pp) [Research, reports and studies]. UN Habitat.  
<https://mirror.unhabitat.org/downloads/docs/GRHS.1996.0.pdf>
- Urban Areas and Cities Act 2011
- Van Noppen, A. (2012). *The ABC's of Affordable Housing in Kenya*.

- Vera-Toscano, E., & Ateca-Amestoy, V. (2008). The relevance of social interactions on housing satisfaction. *Social Indicators Research*, 86(2), 257–274.
- White, M. J., Biddlecom, A. E., & Guo, S. (1993). Immigration, naturalization, and residential assimilation among Asian Americans in 1980. *Social Forces*, 72(1), 93–117.
- William, H. M. (1976). *Man and His Urban Environment: A Sociological Approach*. Addison-Wesley.
- Wu, F. (2001). Housing Provision under Globalisation: A Case Study of Shanghai. *Environment and Planning A: Economy and Space*, 33(10), 1741–1764.  
<https://doi.org/10.1068/a33213>
- Yakob, H., Yusof, F., & Hamdan, H. (2013). Sustainable Urban Housing Development through Planning Mechanism: Issues and Challenges. *Asia Pacific Network for Housing Research (APNHR) Proceedings*.
- Yiping, F. (2005). Residential satisfaction conceptual framework revisited-A study on redeveloped neighbourhood in inner-city Beijing. University of Colorado at Denver. *An Unpublished Doctoral Dissertation*.
- Yin, Ruochen, Xiufang Miao, Zhen Geng, and Yunyun Sun. "Assessment of Residential Satisfaction and Influence Mechanism; a Case Study of Jinan City." *Journal of Business Administration Research* 7, no. 2 (2018): 9-16.
- Zillow. (2014, January 3). Zillow Home Value Index: Methodology. *Zillow Research*.  
<https://www.zillow.com/research/zhvi-methodology-6032/>

## APPENDICES

### APPENDIX I: QUESTIONNAIRE

#### Sociodemographic Information

1. GPS coordinates of the sampled house .....
2. Occupant
  - Renter  Owner
3. Age .....
4. Household size .....
5. Marital status
  - Married  Single
6. Highest education level
  - None  Primary  Secondary  Tertiary
7. Are you employed yes/no?
  - Yes  No
  - If yes
    - Public service  Self-employed  Casual labourer
8. Income range
  - Below 10,000  10,001 – 20,000  20,001 – 30,000  30,001 – 40,000
  - 40,001 – 50,000  50,001 – 60,000  60,001 – 70,000  70,001 – 80,000
  - 80,001 – 90,000  90,001 – 100,000  Above 100,000
9. Housing expenditure

No.	Service	Cost (Kshs.)
1.	Rent	
2.	Water	
3.	Electricity	
4.	Transport	
5.	Mortgage repayment	
6.	Food, Clothing	
<b>Total</b>		

### Housing Satisfaction

10. How satisfied are you with your residential environment?

- Extremely Satisfied    Very Satisfied    Moderately Satisfied  
 Slightly Satisfied    Not Satisfied

11. Why did you choose to live in this residential environment?

- a) .....
- b) .....
- c) .....

12. Do you think the rental cost of your housing is affordable?

- Yes    No

If no how much do you think is affordable .....

13. Would you recommend a friend/ relative to live in this neighbourhood?

- Yes    No

Why .....

### Housing Attributes

**a) Dwelling unit features**

14. Identify the housing type

- Bungalow    Multi-Family Housing    Maisonette    Flats    Row Housing

Other Specify .....

15. Number of bedrooms

- Single Room    One Bedroom    Two Bedroom    Three Bedroom    Four  
 Bedroom and Above

16. Building material

---

**Roof**

---

**Floor**

---

**Wall**

---

17. How would you rate natural ventilation of your house?



- Extremely Satisfied    Very Satisfied    Moderately Satisfied  
 Slightly Satisfied    Not Satisfied

18. How would you rate natural lighting of your house?

- Extremely Satisfied    Very Satisfied    Moderately Satisfied  
 Slightly Satisfied    Not Satisfied

19. How would you rate the clean-up state around your dwelling unit?

- Extremely Satisfied    Very Satisfied    Moderately Satisfied  
 Slightly Satisfied    Not Satisfied

**b) Neighbourhood features**

20. Estimate the distance to your primary school

Distance ..... (Km/m), primary school..... (Name, GPS coordinates)

21. Estimate the distance to your Secondary school

Distance ..... (Km/m), primary school..... (Name, GPS coordinates)

22. Estimate the distance to where you receive healthcare

Distance ..... (Km/m), primary school..... (Name, GPS coordinates)

23. Estimate the distance to a public playground/cultural facility/leisure centre

Distance ..... (Km/m) name ..... (GPS coordinates)

24. Estimate the distance to your place of work by public transport

Distance ..... (Km/m), Place of Work ..... (Name, GPS coordinates)

25. How would you rate public security in this neighbourhood?

- Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

26. How would you rate public transport in your neighbourhood?

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

Why.....

.....

27. What is the closest police service in the area?

Name ..... Distance ..... (GPS coordinates map)

.....

28. How would you rate the state of cleanliness of your neighbourhood?

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

29. Rate the state of:

a) Water service delivery

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

b) Electricity service delivery

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

c) Road network

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

d) Street lighting at night

Extremely Satisfied    Very Satisfied    Moderately Satisfied

Slightly Satisfied    Not Satisfied

### Compliance to Residential Planning Standards

30. Determine the width of the access road to the plot sampled .....

(metres)

31. Identify means of liquid waste disposal .....

32. Estimate the Plot coverage in percentage .....

33. Determine the building lines of the plot sampled

No	Side	Distance(m)
1.	Front	
2.	Side	
3.	Rear	

34. Determine the skyline of the building in the plot sampled .....

35. Determine the number of dwelling units on the plot .....

36. Determine the size of the plot (acres) .....

**APPENDIX II: LIST OF NEIGHBOURHOODS IN STUDY AREA**

<b>No.</b>	<b>Low Density Neighbourhoods</b>	<b>Medium Density Neighbourhoods</b>	<b>High Density Neighbourhoods</b>
<b>1.</b>	Elgon View	West Indies (Block 5)	Shauri Yako
<b>2.</b>		Kapsoya (Block 8)	Gardens Block 10 (Action Area and War Memorial)
<b>3.</b>		Kapsoya (Block 9)	Block 11(Mwanzo and Kidiwa)
<b>4.</b>		Hazina/Kenya RE	Munyaka,
<b>5.</b>		Rock Centre area	Block 15(Kipkarren, Huruma and Rural Housing Estates)
<b>6.</b>		Block 12 (Pioneer)	Kamukunji (Block 16)
<b>7.</b>		Sambu (Block 19)	Langas (Block 22)
<b>8.</b>		Kingongo (Block 23)	Kipkenyo (Block 24)
<b>9.</b>		Rehema (Block 28)	
<b>10.</b>		Mushroom (Block 28)	
<b>11.</b>		Kimumu (Block 30)	

**APPENDIX III: OBSERVATION CHECKLIST**

<b>No.</b>	<b>Criteria</b>	<b>Delivery</b>
<b>1.</b>	Dwelling units on the Plot	Number of dwelling units on the plot
<b>2.</b>	Skyline	Number of floors the dwelling unit on the floor has

**APPENDIX IV: RESEARCH PERMIT**

  
**REPUBLIC OF KENYA**

  
**NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **305607** Date of Issue: **24/January/2020**

**RESEARCH LICENSE**



**This is to Certify that Mr. DENNIS ALIMA of University of Eldoret, has been licensed to conduct research in Uasin-Gishu on the topic: ASSESSMENT OF RESIDENTIAL HOUSING SATISFACTION IN PLANNED UNIT DEVELOPMENTS OF ELDORET MUNICIPALITY for the period ending : 24/January/2021.**

License No: **NACOSTI/P/20/3537**

Applicant Identification Number **305607**

  
Director General  
**NATIONAL COMMISSION FOR  
SCIENCE, TECHNOLOGY &  
INNOVATION**

Verification QR Code



**NOTE: This is a computer generated License. To verify the authenticity of this document,  
Scan the QR Code using QR scanner application.**

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies
5. The License does not give authority to transfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

National Commission for Science, Technology and Innovation  
off Waiyaki Way, Upper Kabete,  
P. O. Box 30623, 00100 Nairobi, KENYA  
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077  
Mobile: 0713 788 787 / 0735 404 245  
E-mail: [dg@nacosti.go.ke](mailto:dg@nacosti.go.ke) / [registry@nacosti.go.ke](mailto:registry@nacosti.go.ke)  
Website: [www.nacosti.go.ke](http://www.nacosti.go.ke)


## APPENDIX V: SIMILARITY REPORT

## Turnitin Originality Report

Processed on: 26-May-2021 11:02 EAT  
ID: 1594444936  
Word Count: 29227  
Submitted: 1

**SENV/EPM/M/004/18 By  
Dennis Alima Tovesi**

Document Viewer



<p style="margin: 0;">Similarity Index</p> <p style="font-size: 24px; margin: 0;"><b>15%</b></p>	<p style="margin: 0;"><b>Similarity by Source</b></p> <p style="margin: 0;">Internet Sources: 12%</p> <p style="margin: 0;">Publications: 7%</p> <p style="margin: 0;">Student Papers: 6%</p>
--	---

include quoted   
 include bibliography   
 excluding matches < 5 words   
mode:

<p style="margin: 0;">1% match (Internet from 26-Nov-2020)</p> <p style="margin: 0;"><a href="http://irep.lium.edu.my">http://irep.lium.edu.my</a></p>	<input type="checkbox"/>
<p style="margin: 0;">1% match (Internet from 20-Jul-2020)</p> <p style="margin: 0;"><a href="http://www.devolution.go.ke">http://www.devolution.go.ke</a></p>	<input type="checkbox"/>
<p style="margin: 0;">1% match (publications)</p> <p style="margin: 0;">G. Knaap. "New Urbanism and Smart Growth: A Few Words from the Academy", <i>International Regional Science Review</i>, 04/01/2005</p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match (Internet from 14-Apr-2018)</p> <p style="margin: 0;"><a href="http://irep.lium.edu.my">http://irep.lium.edu.my</a></p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match ()</p> <p style="margin: 0;">Mohit, Mohammad Abdul, Al-Khanbashi, Adel Mahfoud Mubarak. "Residential satisfaction: concept, theories and empirical studies", <i>Malaysian Institute of Planners</i>, 2014</p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match (Internet from 22-Jul-2020)</p> <p style="margin: 0;"><a href="http://erepository.uonbi.ac.ke">http://erepository.uonbi.ac.ke</a></p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match (Internet from 14-Apr-2021)</p> <p style="margin: 0;"><a href="http://erepository.uonbi.ac.ke">http://erepository.uonbi.ac.ke</a></p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match (Internet from 14-Apr-2021)</p> <p style="margin: 0;"><a href="http://erepository.uonbi.ac.ke">http://erepository.uonbi.ac.ke</a></p>	<input type="checkbox"/>
<p style="margin: 0;">&lt;1% match (Internet from 22-Jul-2020)</p> <p style="margin: 0;"><a href="http://erepository.uonbi.ac.ke">http://erepository.uonbi.ac.ke</a></p>	<input type="checkbox"/>