

**A STUDY OF CHALLENGES FACING CONSTRUCTION  
OF AFFORDABLE DECENT LOW-COST HOUSING IN  
TURKANA COUNTY**

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**A Study of Challenges Facing Construction of Affordable Decent Low-Cost  
Housing in Turkana County**

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**A thesis submitted in partial fulfillment for the degree of Master of Science in  
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Agriculture and Technology**

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## DECLARATION

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

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## **DEDICATION**

This work is dedicated to my dear wife Susan and my lovely daughter Felicity and sons Reagan and Kieran for their patience and support during the entire process of course work and thesis writing.

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First, I would like to acknowledge and thank the Almighty God for His Grace and protection during the entire period of this study. I also thank all my family members for their support and encouragement, but I would especially like to thank my wife Susan for the encouragement, support and understanding during this study.

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## ACRONYMS AND ABBREVIATIONS

<b>ABMT</b>	: Appropriate Building and Material Technologies
<b>AIDS</b>	: Acquired Immune Deficiency Syndrome
<b>CIDP</b>	: County Integrated Development Plan
<b>COK</b>	: Constitution of Kenya
<b>GDP</b>	: Gross Domestic Product
<b>GOK</b>	: Government of Kenya
<b>HABRI</b>	: Housing and Building Research Institute
<b>ISSB</b>	: Interlocking Stabilized Soil Blocks
<b>JKUAT</b>	: Jomo Kenyatta University of Agriculture and Technology
<b>KIHBS</b>	: Kenya Integrated Household Budget Survey
<b>KNBS</b>	: Kenya National Bureau of Statistics
<b>NGOs</b>	: Non-Governmental Organizations
<b>SAP</b>	: Structural Adjustment Programmes
<b>SDGs</b>	: Sustainable Development Goals
<b>SSB</b>	: Stabilized Soil Blocks
<b>UNCHS</b>	: United Nations Centre for Human Settlements
<b>UN-HABITAT</b>	: United Nations Human Settlement Programme

## ABSTRACT

Whereas housing problems in developed countries are characterised by overcrowding, dilapidated structures and shared bathrooms, developing countries like Kenya, the problem is complicated by lack of serviced land, lack of access to housing finances, rigid legal framework and over dependence on non-local construction materials, techniques and technologies. The objectives of the study were to find out challenges facing construction of low cost decent housing in Turkana, assess the impact of the challenges in the provision of low cost decent housing in Turkana County and suggest a housing policy agenda that addresses the challenges identified in the provision of low cost decent housing in Turkana County. Descriptive research design was adopted for this study, where the targeted population was all 123,192 households in Turkana County. The sample size comprised of 382 households. The sample was identified using stratified random sampling technique and structured questionnaires were used to collect data from the households in six administrative sub-counties of Turkana County. Qualitative data was analysed using content analysis based on analysis of meanings and implications emanating from respondents' information and documented data and is presented in discussions thereof. For quantitative data, simple descriptive statistics were used to analyze data by way of frequency counts is presented in tables, frequencies and percentages. The study established that the key challenges facing provision of low cost housing and which also affects their quality were attributed to low income levels, regulatory framework, unfriendly land tenure, availability of materials, poor infrastructure, security and lack of government incentives. The study recommends that Turkana County Government spearhead development and implementation of a tailor-made housing policy in partnership with other stakeholders geared towards addressing the housing challenges identified.

**Keywords:** Decent Housing, Policy, Housing Finance, Households

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Problem**

Housing is vital to human life as it ranks among the top three needs of man. Its provision has always been of great necessity to man. Access to decent housing has been part of human right since 1948 after the famous Universal Declaration of Human Rights (UN Assembly, 1948). The same was affirmed in Vancouver in 1976 during declaration on Human Settlement. However, realization of this right has proved difficult to attain world over (Miles & Syagga, 1987). Nonetheless, the COK (2010) guarantees every Kenyan citizen a right to adequate and accessible housing with reasonable standards of sanitation.

Besides being a basic necessity, housing has big influence on each person's quality of life, health and psychological well-being as well as being a symbol of comfort, safety and identity. It reflects the cultural, social and economic values of a society and one of the top historical indications of civilization of a country. Housing is a set of fixed assets, which makes up a significant proportion of a country's wealth (fixed capital), a stimulant of the national economy and on which households devote a sizable part of their income. This is the reason housing has become a regular theme in highly charged political, economic and social debates world over (World Bank, 1993).

The development of decent housing can be a vital catalyst of both economic and social development that can lead to the deepening of principles and democratic institutions. Housing investment in developing countries makes up between 15% and 30% of fixed capital formation. As economies improve, housing investment becomes an even greater component of Gross Domestic Product (GDP) (Buckley & Mayo, 1988).

Housing development can be effective creator of jobs in developing countries especially in Sub-Saharan Africa, where construction technology is still largely labor-intensive and most housing is made with locally available materials. Low-cost housing construction utilizes mainly unskilled labor and it can therefore provide significant number of decent paying jobs for the poor who have limited employment opportunities and education. In addition, housing development generates jobs in many other secondary industries such as furniture, equipment and supplies (Tipple, 1994).

The multiplier generated by housing development in developing countries is estimated to be 1.0, meaning that for every Kenyan Shilling spent on housing; another Kenyan shilling is spent in other sectors. Studies have also shown that improved shelter can provide increased opportunities for home-based income earning activities (National Association of Realtors, 2013).

Housing, as a unit of the environment, has profound influence on the efficiency, health, general welfare, social behavior and even the satisfaction of the community (World Bank, 1993). People living in sub-standard housing are likely to have high occurrences of infectious and environmental diseases such as respiratory disorders, pulmonary tuberculosis, diarrhoea, dysentery, cholera and other gastrointestinal sicknesses. Decent housing in an environmentally safe neighborhood also improves the chances for success in management of ailments such as AIDS, tuberculosis and malaria. Similarly, curative approaches have also proven more effective where patients have access to safe drinking water supplies and warm, clean housing (Spreekmeester, 2004).

No country can boast that they have adequately housed all its tiers of the economic groups. It is estimated that there are 100 million people who are homeless and about one billion people who are housed in inadequate houses throughout the world (UNCHS 1996, Erguden, 2001). Developing countries suffer the most acute shortage with significant number of people, especially children, dying daily due to lack of adequate shelter. Many scholars argue that it is not easy to make uniform criteria for adequate

housing all over the world, but some general norms are affordability, legal security of tenure, accessibility, availability of services and infrastructure, habitability, location and cultural adequacy (World Bank, 1993).

Developing countries are implementing low-cost sustainable housing to improve quality of life of its people and protect them against adverse climate changes impacts. Capability to organize and advance these efforts are limited and inconsistent while there are advanced standards, guidelines, design tools and life cycle assessment tools which are available in developed nations can be utilized to a limited degree in developing nations. The Kyoto Protocol through Clean Development Mechanism (CDM) has been largely ineffective in supporting low-cost sustainable housing in developing nations (UN Habitat, 2011).

The problem of housing in developed countries is more of overcrowding, dilapidated structures characterized by shared bathrooms, not fully equipped kitchens or faulty electrical wiring, broken down or insufficient heating and cracks in walls and ceilings (Schusheim, 2004).

There are an estimated 554,000 people in the United States of America, experiencing homelessness on a given night, according to 2017 estimate which was 0.7% increase from 2016. This represents a rate of roughly 17 people experiencing homelessness in every 10,000 people in the general population (U.S. Department of Housing and Urban Development, 2017). This number has been increasing consistently since 1960's due to removal of many cheap hotels and rooming houses because of urban renewal, expressway construction and private development, the closing of state hospitals for the mentally ill as well as the surging of drug abuse cases. The problem of housing has also been aggravated by segregation of low-income minority families. In the 1990's, the rural population of the US, about 3.6 million poor and near poor rural households had substantial housing problems with the main problem being burdensome costs (Schusheim, 2004).

The biggest constraints to affordable housing in Nigeria have been categorized into three challenges: macro-economic and political environment, building material costs and finance. It was found that the major issues affecting shelter in Nigeria include availability of suitable land, affordable building materials and supplies that is largely imported, income that is distributed unevenly and bloated family size amongst low-income groups (Ayedun & Oluwatobi, 2011).

The Kenyan economy has had difficulties since independence in 1963 and several measures have been put in place to mitigate them. The most notable economic change that Kenya implemented with the aim of turning around the economy was the introduction of the Structural Adjustment Programmes (SAPs) that came into effect during the 1980/81 fiscal years. The International Monetary Fund (IMF) and World Bank as a condition for the granting loans or the restructuring of existing debt applied the SAPs in developing countries in the 1980s-1990s. The change in policy entailed increase of exports in order to spur foreign investment and privatization of public companies, among other market-oriented changes (Manundu, 1997).

The main aim of adopting the SAPs was to improve economic growth through restoration of efficiency in all sectors of the economy. (Central Bureau of Statistics 1997b). However, these SAPs had numerous negative effects on the economy, such as inflation pressures, the marginalization of the poor especially in education and health sectors and a reduction in employment and in extension affecting housing development (Mwega & Ndulu, 1994). The 1979/1980 drought had the first large scale and drastic impact. Emergency food aid was extended, and various development projects have since been carried including tarmacking of road between Kakuma and Lodwar. Market economy, formal education and modern medical systems were strengthened to mitigate the effects of the drought (Barrett, 1998).

As part of operationalizing The National Housing Policy of 2004, the GOK through the Ministry of Housing established Appropriate Building Materials and Technology

(ABMT) programme in 2006 to address high building costs. The Ministry in collaboration with HABRI of University of Nairobi together with development partners and other stakeholders came together in the research development and dissemination of ABMT particularly stabilized soil blocks (SSB's), micro concrete roofing tiles (MCR) and pozzolanic/rice husk cement. The Ministry has been able to set up a Regional ABMT Centre at Mlolongo and 90 Constituency ABMT Centres across the country including one in Lodwar Town, which are focal points for collaborative research, technology incubation, dissemination of ABMT information and leasing out ABMT equipment.

Turkana County is one of the most underdeveloped counties in terms of housing in Kenya. The types of houses dotting this expansive county, which comprises of *Manyatta* (60.4%), Swahili type (3.9%), *Landhi* (7.0%) and Shanties (1.4%), reflect this. The dominant wall material used in the construction is palm trunks/grass/reeds (52.1%), sticks with mud/cow dung (25.5%), cement finish (6.2%) and corrugated iron sheets (4.9%). Similarly, the main roofing materials of main dwellings are *makuti* (42.9%), iron sheets (20.4%), grass (1.8%), tin (1.1%), concrete/clay tiles (0.0%) and other materials (33.8%). Spatial characteristics of such dwellings are majorly single roomed (94.5%) with only 4.8% being double roomed giving an average of 4.2 persons per habitable room (KNBS, 2018).

Most of the housing stock in Turkana County cannot meet the threshold of decent housing based on Department of Communities and Local Government of United Kingdom (UK) where for a home to be termed as decent, it must meet the following four criteria: First, it should meet the statutory minimum standard for housing. Secondly, it should be in a reasonable state of repair. Thirdly, it should have reasonably modern facilities and services and lastly, it should be able to provide a reasonable degree of thermal comfort (Housing Health and Safety Rating System, 2006)

## **1.2 Statement of Problem**

Turkana County has the third highest number of people categorized as homeless after Nairobi and Mombasa (KNBS, 2012). This situation is made worse by frequent cases of cattle rustling along its borders with neighboring counties and countries as well as harsh climatic conditions of this County. The main economic activity of Turkana people, which is pastoralism, require them to move from one place to another in search of pasture exacerbate the housing condition of these people.

The inaugural County Integrated Development Plan (CIDP 2012-2017) for Turkana is based on ten sectors: Agriculture, Water Services and Irrigation sector; Health and Sanitation Services Sector; Energy, Environment and Natural Resources Sector; Public Service, Decentralized Services and Disaster Management Sector; Tourism, Trade and Industry Sector; Pastoral Economy and Fisheries Sector; Human Resource and Development, Gender, Children and Social Services Sector; Transport, Roads, Housing and Public Works; and Education Sector. The County received a total share Kshs. 51.5 billion for the first five years of devolution in line with County Allocation of Revenue Act. Housing function was allocated cumulative of Kshs 120 million for the period covered by the CIDP. This means that a meagre 0.23% of the total budget went towards housing development.

It is evident that despite numerous incentives, Housing Policies and programmes to improve housing across the Country, Turkana County still lags in development of decent houses while the current stock is in deplorable state. The housing development seem not to be getting the required traction at the County level with little participation by the local community due to inconsistent income and unfavorable economic activities. For this problem to be addressed, all stakeholders must understand the challenges experienced in the provision of low cost decent housing. This research therefore aims to finding out the challenges experienced in the provision of low cost decent housing and suggest housing policy agenda for Turkana County that will mitigate the challenges.

### **1.3 Research Objectives**

The overall objective was to find out the challenges faced by Turkana County in the provision of low cost decent housing.

#### **1.3.1 The specific objectives of this study are:**

1. To find out challenges facing construction of low cost decent housing in Turkana.
2. To assess the impact of the challenges in the provision of low cost decent housing in Turkana County.
3. To suggest a housing policy agenda that addresses the challenges identified in the provision of low cost decent housing in Turkana County.

### **1.4 Research Questions**

1. What are the challenges facing construction of low cost decent housing in Turkana County?
2. What are the impacts of the stated challenges in the provision of low cost decent housing in Turkana County?
3. What should the County of Turkana do to provide more houses that are decent?

### **1.5 Significance of the Study**

For many years, housing has never been a major agenda in the national and political arena. However, this has changed drastically with debate by major protagonist in the run up to 2017 general elections delving in to the housing issue. Captured in the presidential manifestos were provision of 500,000 affordable houses, improvement of rural housing and use of alternative materials and technologies to deliver on the targets among other promises. This study will come in handy to policy makers, county governments, academia and various manifesto delivery units in identifying the challenges faced in the provision of low cost housing especially for low-income earners and marginalized groups in the society. All the housing stakeholders will then direct the efforts and

resources to addressing these challenges so that the right to decent housing as envisaged in the Constitution of Kenya, 2010 may be realized progressively.

### **1.6 Scope of the Study**

This study covered only challenges experienced in the development of housing targeted at low to moderate-income levels where the majority of the people of of Turkana County. The study relied on review of literature of other scholars on housing theories and approaches that have been fronted worldwide, how housing markets behave, low cost housing models, the role of government and the private sector in the provision of low cost housing and challenges in housing development documented.

The study was carried out in the six administrative Sub-Counties of Turkana County. They are Turkana North, Turkana South, Turkana Central, Turkana East, Turkana West and Loima.

### **1.7 Limitations of the Study**

This study was limited only to Turkana County and all data collected are unique to this County. This study also focused on residential houses only and thus did not include academic facilities, health facilities and commercial buildings. Turkana County is a vast County with difficult accessibility and insecurity issues which could not be covered extensively within the limited time and budget. The data collection was carefully done within areas easily accessible and with guaranteed security.

### **1.8 Layout of the Study**

The structure of the thesis is covered in five main chapters to ensure that all crucial components of the research are captured.

Chapter one is introduction to the study and it encompasses the background of the study; statement of the problem; objectives of the study with research questions; justification of the study; scope and limitations of the study and the study layout.

Chapter two encompasses literature review of past studies related to the proposed study. This includes literature on Housing as a Human Right, the low-cost housing market, housing theories and approaches low cost housing models. It also highlights and reviews the Kenya Housing Policy, government role in the provision of low cost housing and the role of the private sector in the provision of low cost housing. Similarly, it explores major constraints to providing housing globally and locally.

Chapter three discusses the methodology and strategy of the study and it comprises an introduction, study design, description of the study area. It further contains the data collection design, population, sample and sampling, types of data gathered, research strategy, research instruments and how the data analysis and presentation was done.

Chapter four of this study covers data analysis, presentation and discussion. It also has an in-depth analysis of the outcome of the study.

Chapter five is made up of summary and discussions of major findings, conclusions and recommendations of the study. The recommendation also provides suggestions on areas for further research for policy makers or implementers and the academia.

### **1.9 Operational Definition of Terms**

**Affordable housing-** is housing that is appropriate for the needs of a range of very low to moderate-income households. The housing under this category are priced in such a way that the households are also able to meet their other basic living costs such as clothing, food, transport, education and medical care. As a rule of thumb, housing is usually considered affordable if it costs less than 30% of gross income of the household (GOK, 2004).

**Appropriate building materials and technologies-** are the building processes and tools that are appropriate to the climate, social-economic conditions and natural resources of an area: which contribute to sustainable development (GOK, 2004).

**Decent housing-** is housing that meet minimum fitness standard for housing, have modern facilities, is in reasonable state of repair and having thermal comfort (Housing Health and Safety Rating System, 2006).

**Homelessness-** is a situation where households are without a shelter that can be categorized as living quarters. The households carry their few possessions from place to place and sleep on the streets, in doorways, on piers or in any other space on a random basis (GOK, 2004).

**Housing-** is a multi-dimensional product that includes physical shelter, the socio-economic and cultural dynamics, related services and infrastructure and the inputs required to produce and maintain it. It also includes the processes and outcomes of the production and use of residential dwelling (GOK, 2004).

**Household-** A person or a group of people living in the same compound (fenced or unfenced); answerable to the same head and sharing a common source of food and/or income as a single unit in the sense that they have common housekeeping arrangements and share or are supported by a common budget (businessdictionary.com).

**Low cost housing-** housing that is functional, adequate and affordable to those who earn low incomes (GOK, 2004).

**Poverty-** inadequacy of income and deprivation of basic needs and rights such as housing, lack of access to productive assets as well as social infrastructure and markets (GOK, 2004).

**Security of tenure-** the right of all individuals and groups to effective protection by the state against forced evictions. Under international law, ‘forced eviction’ is defined as:

the permanent or temporary removal against their will of individuals, families and/or communities from the homes and/or land which they occupy, without the provision of, and access to, appropriate form of legal or other protection (GOK, 2004).

**Turkana County (County number 23)**- this is one of the 47 counties in Kenya found in the most northwestern part of Kenya. It borders Uganda to the west, South Sudan to the north and Ethiopia to the northeast. This county is also the second largest county in land area in Kenya (COK, 2010).

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter provides a review of various housing concepts and previous studies related to challenges experienced in trying to bridge the housing deficit especially in the lower segment of the population of low cost housing. Such challenges are not unique to Kenya alone and aim at comparing and analyzing different global authors' views to draw lessons and highlight gaps from the developed countries and nearer home in Africa.

#### **2.2 Housing Theories and Approaches**

Several views about challenges in housing have been fronted in the recent past, which is set within the market economy and socialist contexts. They include:

##### **2.2.1 The Demolitionist Approach**

This approach to housing emerged in the 1950's and viewed spontaneous settlement as parasitic, destroying the beauty and healthiness of cities. The planners' response to this spontaneous settlement was demolitionist in diminishing of existing housing stock of the urban poor (Mittulah, 2003).

##### **2.2.2 The Supportive Approach**

Mittulah (2003) opines that this approach was the compromise between the state and the housing needs of the urban poor. The approach recommended an integration of state empowerment and the self-help responsibility of the poor, with a vision that housing was not just a shelter to live in but also a means to move upward socially. However, the housing success depended largely on the combined efforts of the community with the government playing merely a supportive role, providing public utilities and initial

funding. This approach depended heavily on political will from the government as well as institutional and structural support and as a result faced implementation difficulties in developing countries.

### **2.2.3 The World Bank Approach**

The World Bank implemented the cost-recovery principle based on the view that investment in low-cost housing would speed up economic development. With this arrangement, developing countries got loans from the World Bank to invest in low-cost housing schemes, delivered these units to housing dwellers and converted occupiers to debtors of commercial banks, thus liquidating funds for reinvestment by the government. This was intended to strengthen the market mechanism and minimize the bottlenecks of housing delivery. However, the World Bank approach was criticized for an over focus on market mechanisms, paying little attention to issues such as land tenure and infrastructure (Mittulah, 2003).

### **2.2.4 The Social Structural Approach**

This approach took a structural perspective to housing, arguing that previous approaches emphasized capitalist logic and overlooked the conflict among modes of production. It therefore advocates that political structural transformation would be required with communities having the right to organize and self-build their communities (Mittulah, 2003).

### **2.2.5 The Collaborative Approach**

According to Mittulah (2003), this approach emphasized collaboration between the government, the market, NGOs and the community, a set-up that would increase the potential of the community. Good governance and state support would focus on the well-being of low-income communities, using housing as a means of social mobility. The difference from earlier approaches was that it sought to merge the community with

government interaction and support to obtain practical solutions in the community's initiative.

## **2.3 Housing Markets**

### **2.3.1 Housing in the Global Market**

In Nigeria, Adedeji (2012) attributes the high cost of construction to rising cost of building materials, inflation rate in the economy, high space and quality standard adopted by designers, professional fees for housing design and construction, excessive profit of contractors and 10% interest payable on National Housing Fund (NHF). The problems of population explosion, continuous influx of people from the rural to the urban centres, and the lack of basic infrastructure required for good standard of living have compounded housing problems over the years in Nigeria. Olotuah (2009) observed that the disparity between the price and quantity of housing on the one hand, and the number of households and the money available to them to pay these prices on the other, constitutes the central problem of housing. According to Okupe and Windapo (2000), the gap between income and housing cost in Nigeria is very wide. This has almost eliminated the low-income earners from the housing market.

Sufiana and Ibrahim (2011) observed that the Malaysian government through its various Malaysia Plans has continuously addressed the issue of poverty and allocation of houses for the poor or low-income citizens to ensure adequate shelter for all. Comparatively in Malaysia, the need for a shelter is not a mere place to stay but it needs other infrastructures or facilities to come together with that accommodation.

Embedded infrastructure such as water, sewerage, roads, electricity, social services and security are a vital component of housing provision and are fundamental to the success of any housing scheme. These in turn, will greatly improve the people's economic capacities, health and quality of life in general (Nabutola, 2004).

Most proposed solutions for low-income housing provision revolve around policy reform to improve the attractiveness of the sector as well as to involve government in direct supply of housing. Private sector developers who have the ability and knowledge to deliver housing to the low-income market yet are inhibited by market fundamentals and the operating environment thus reducing their profit taking opportunity, should be given more attention (Hassanali, 2009).

### **2.3.2 The Low-Cost Housing**

According to Smith (2006), market prices reflect market demand considering half of every population is below median income, market-quality housing commands market prices. Consequently, markets alone will never house nation's poorest citizens satisfactorily. Therefore, whether people buy or rent, housing is naturally affordable to only half of the populace.

The housing market comprise of three tier sub-systems. The first is the small but well-financed upper-class market, which is an exclusive realm of the private sector and funded by institutional finance systems. The second tier is the subsidized market intended for middle class workers and civil servants who benefit from public housing. Finally, there is the large and private incremental housing sub-market with no access to formal financing services and which produce housing, which does not generally conform to official building codes and regulations (Renaud, 1987).

### **2.3.3 Turkana County Housing**

Turkana County of Kenya has been one of the most marginalized and forgotten parts of the country for many years despite the SAPs. In fact, according to Basic Report on Well-Being in Kenya based on 2015/2016 Kenya Integrated Household Budget Survey (KIHBS) (KNBS, 2018), the absolute poverty rate of this County stands at 79.4% placing it as the poorest County in Kenya. This informs the quality of houses dotting this expansive county, which comprises of *manyatta* (60.4%), *landhi* (7.0%), swahili type

(3.9%) and shanties (1.4%). The dominant wall material used in the construction is palm trunks/grass/reeds (52.1%), sticks with mud/cow dung (25.5%), cement finish (6.2%) and corrugated iron sheets (4.9%). Similarly, the main roofing materials of main dwellings are *makuti* (42.9%), iron sheets (20.4%), grass (1.8%), tin (1.1%), concrete/clay tiles (0.0%) and other materials (33.8%). Similarly, the main roofing materials of main dwellings are grass/*makuti* (59.8%), iron sheets (27.1%), asbestos (3.4%) and other materials (8.9%). Spatial characteristics of such dwellings are majorly single roomed (94.5%) with only 4.8% being double roomed giving an average of 4.2 persons per habitable room (KNBS, 2018).

With the promulgation of new Constitution of Kenya in 2010, housing implementation function was devolved to County Governments with the National Government tasked with policy function. The influences of government policies on housing markets and neighbourhoods are mostly gradual, and it is far easier to plan targets than outcomes. Nevertheless, devolution itself does not mean that devolved policies will deliver more or better housing for low-income households. The devolved administrations may have to make different choices about the priority afforded to housing within their devolved budgets, which in most cases is constrained (Wilcox & Fitzpatrick, 2010).

## **2.4 Low Cost Housing Models**

There are several models of housing development for low-income housing initiatives that has been explored (World Bank, 2003). They are:

### **2.4.1 Sites plus Development Plan and Gradual Implementation of Services**

Under this model, settlements are planned and surveyed, plots allocated and occupied, and infrastructure gradually implemented.

### **2.4.2 Sites and Services Model**

In sites and services scheme, the government or its agency provides infrastructural serviced plots for individuals who are then encouraged to erect their own type of buildings. The underlying principle of sites and services project is that authorities would provide the land and the infrastructural facilities such as access roads, drainage, water, sewage, electricity and a variety of other community services, while the individual and his household who are allocated the serviced plot proceed to build their house in accordance with approved plans but of own choice.

### **2.4.3 Comprehensive upgrading of existing settlements**

Current approaches to upgrading fall into two broad categories. The more common approach in Anglophone countries is that which evolved in countries such as Sri Lanka, India and Pakistan. These focus very much on upgrading and tend to operate on a sectoral basis. That is, they seek to address a specific need (e.g. water supply or housing) and do not seek to map out a long-term plan for the settlement. In this approach, the spatial relationship between the dwellings is kept unchanged. This approach may result in slum improvement, but it does not really change the status of the informal settlement (Abbott, 2000).

Abbott (2000) observes that the second approach is quite different. This second approach was pioneered in Belo Horizonte in Brazil and is now the dominant approach in Latin America. This approach is based more upon the principle of formalizing the settlement than upon sectoral improvement. As this requires modifying the spatial layout of the settlement, it means that government must be more directly involved, as greater resources and government support are both prerequisites.

#### **2.4.4 Development of new housing in new settlement**

New infrastructure and housing units are built on empty land; or new housing units on available land in existing serviced areas. The Rwanda government for example adopted the model of developing new housing settlements (village settlements) for her population through the *Imidugudu* project. They are grouped settlements modeled along the lines of Israel's Kibbutz. *Imidugudu* was intended as an emergency housing project in late 1990s, to accommodate refugees who had returned mainly from Burundi. The resettling of refugees and people living in scattered homes into more concentrated newly built village settlements was meant to resolve the immediate housing shortage and address the problem of settlement and land use, to promote security and reconciliation, facilitate the provision of basic services and infrastructure, and help improve agricultural productivity. Supported by donors, the government embarked on building *Imidugudu* sites, and by 1999-2000, when the construction of new sites declined due to lack of donor support, the policy had affected nearly 20% of the population (Republic of Rwanda, 2004).

However, the *Imidugudu* programme has been extremely contentious. According to Human Rights Watch (2001), the policy was established without any popular consultation. There have been reports of forced relocations and of lack of compensation to people whose land was seized for building *Imidugudu* sites. The policy has also been criticized for not delivering the promised infrastructure and services, for allocating each household too little land and for the new agricultural fields being located too far away from homes. Moreover, the government's assumption that the scheme will improve agricultural productivity is contested, and many are skeptical of the claim that it will help diversify the economy and create non-agricultural employment.

## **2.5 Government Role in the Provision of Low Cost Housing**

### **2.5.1 Government Development Plans**

Each of the housing theories earlier described emphasize on the role of the government in the provision of housing either as a direct supplier or as a facilitator. The role of government in low-income housing is critical and national leaders have a legal and social responsibility to provide services in return for political support.

According to Macoloo (1994), many governments especially in developing countries like Kenya are unable to meet these needs because of administrative, financial, and institutional weakness together with poor planning and rapid population growth. Alleged lack of sufficient funds is one of the main reasons for the poor housing conditions especially in urban areas and available national funds are competed for by various sectors of the economy. Repeatedly, only the “critical” and “productive” sectors such as security, agriculture, education and health are financed and for a long time, the definition of productive sectors has excluded housing provision, particularly for the low-income households.

Through the eleven Malaysian Plans, housing and social services has continued to be the priority of the Malaysian Government. The eleventh plan period (2016-2020) in particular undertook to expedite development and management of adequate, affordable and quality housing to meet increasing demand of the populace with emphasis on low and medium cost houses. Other categories of houses were left to the private developers but holistically encouraging environment friendly facilities for enhanced livability. Consequently, both public and private sectors have constructed a significant number of low-cost houses during the Malaysian Plans spanning 52 years (Malaysia, 2015).

To be fair to the three of main stakeholders in the housing industry comprised of developers, government and citizens, certain incentives should be given to developers involved in the construction of low-cost houses to enable them to deliver houses at the

quality and standard price that are controlled by the Government. The utilization of Industrial Building System (IBS) is one of the methods to minimize the cost of construction of the low-cost houses to assist developers to increase their profit margin since it is alleged that constructions of low-cost houses are not profitable. Apart from that, there are several sets of statutes, regulations and policies, which have been introduced and enforced to govern the development of the housing industry including the development of low-cost housing, (Razali Agus, 2001).

From the 1970s through the 1990s, many African governments assumed that the obligation for providing housing for low and moderate-income families rested with the public sector. Nonetheless, policies that rely on the government for meeting the housing needs of the vast majority of the population have proved to be imaginary. Government-produced housing, which in many cases has been designated for civil servants, has barely scratched the surface of actual demand. Even where lower income public sector housing developments were built, middle-income people often bought into them, displacing the people for whom they were intended. This results in proliferation of informal settlements, poor standards of construction and conflict (UN Habitat, 2005).

Some of the main strategies for housing and service provision in Kenya have mainly targeted urban poor. These comprise slum upgrading and site and service schemes. However, the effectiveness of these strategies has been inhibited by hesitant government attitude to irregular settlements. These strategies have been unsuccessful because of reliance on outdated building by-laws, inappropriate infrastructural standards, and modern designs, construction technology, and conventional building materials that all make housing unaffordable to the poor even after subsidies (Otiso, 2003).

The government initiatives in the provision public housing have proven to be painfully slow with many of the houses provided being economically and socially irrelevant, this further aggravating informal settlements menace (Macoloo, 1994). In April 2007, President Mwai Kibaki launched a US\$12 billion Kenya Slum Upgrading Strategy

aimed at improving the lives of 5.4 million Kenyans over the next 13 years. In December 2007, Minister in charge of Housing announced the Government's plan to set aside 250 acres for development of affordable houses for low-income earners in Mlolongo area in the outskirts of Nairobi (GOK, 2007). Although these developments were welcomed, they soon run in to problems with "landlords" in Kibera Slum who felt threatened by the upgrading and thus pursued legal redress further slowing project implementation. Similarly, Mlolongo project kicked off but stalled midway due to lack of funds.

GOK took cognizance of the acute deficit of housing in the lower end of the market by encouraging supply as a facilitator and enabling policy formulation to mobilize the private sector participation in low-income housing (GOK, 1999). Some recent initiatives include zero-rating of VAT on building materials used in the construction of 20 or more low-income housing. Similarly, developers who put up at least 100 low-cost residential units annually with prior approval, will be subject to corporation tax at the rate of 15% for that year of income (Finance Act, 2016 & the Statute Law Miscellaneous Amendments Act, 2017). Despite these, it is still evident that there is a widening gap between policy formulation and the implementation process, and the status of low-income housing delivery is far beyond adequate. Main areas of challenge that relate to developing country initiatives include rapid urban population growth, the deficiency of the housing loan system and the increase in luxury houses rather than social houses (Yetgin & Lepkova, 2007).

### **2.5.2 Kenya National Housing Policy**

In the past, the Government took up the role of housing supplier by controlling planning, land allocation, development and maintaining housing estates through the National Housing Corporation (NHC). NHC was established in 1953 and was mainly tasked with the responsibility of providing subsidized housing and implementing government

housing policies and programmes through tenant purchase, mortgages, rental and rural housing loan schemes to members of the public, (Housing Act Cap 117, 1967).

However, continued decline of government expenditure towards housing development over the years, have derailed this dream. This is attributed to activities of the parastatal, price controls, inappropriate building regulations and codes as well as a lack of basic planning and provision of services (Otiso, 2003).

Deteriorating housing condition has been aggravated by population explosion, rapid urbanization, widespread poverty and escalating costs of providing housing. The housing shortage in Kenya, like other developing nations expresses itself in overcrowding and proliferation of slum and informal settlements especially in peri-urban areas. In the rural areas, the shortage manifests itself in the poor quality of the housing fabric and lack of basic services such as clean drinking water and sanitation. In a bid to arrest the deteriorating housing condition countrywide and to bridge the shortfall in housing stock arising from demand that by far surpasses supply, the Government of Kenya came up with Sessional Paper No. 3 of 2016 on National Housing Policy. By coming up with the Housing Policy, the GOK aimed at:

- a. Ensuring progressive realization of the right to accessible and adequate housing and reasonable standards of sanitation for every Kenyan as per article 43 of COK;
- b. Enabling the low-income households to access housing, basic services and infrastructure necessary for healthy living environment especially in urban and peri-urban areas;
- c. Encouraging integrated and participatory approaches to slum upgrading which include income-generating activities that effectively combat poverty;
- d. Promoting and funding of collaborative research on the development of low cost building materials and construction technologies;

- e. Facilitating increased investment by the formal and informal private sector, in the production of housing for low and middle-income urban dwellers; and
- f. Creating a National Housing Development Fund to be financed through budgetary allocations and financial support from development partners and other sources for rental social housing and related infrastructure, and other low-cost housing programmes (GOK, 2016).

### **2.5.3 Housing Development Financing**

Article 204 of the COK provides for creation of equalization fund, which shall be paid 1% of all revenues collected by the National Government each year calculated based on the most recent audited accounts of revenue received as approved by the National Assembly. The National Government is expected to use the Equalization Fund only to provide basic services that are fundamental to housing including water, roads, health facilities and electricity to marginalized areas. This is to the extent necessary to bring the quality of those services in those areas to the level generally enjoyed by the rest of the nation so far as possible for a period of 20 years which may be extended by parliament (COK, 2010).

In 2012, 14 counties were chosen to benefit from the affirmative programme for three years. They are Turkana, Mandera, Wajir, Marsabit, Samburu, West Pokot, Tana River, Narok, Kwale, Garrisa, Kilifi, Taita Taveta, Isiolo and Lamu counties. This fund could be utilized well to spur housing growth in Turkana County. However, this has been delayed due to preparation of the marginalization policy and regulations that took too long (Shitemi, 2014).

### **2.5.4 Sustainable Development Goals (SDGs)**

In September 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development that includes 17 SDGs. Building on the principle of “leaving no one behind”, the new Agenda emphasizes a holistic approach to achieving sustainable

development for all. Goal number 11 in particular is targeted at making cities and human settlements inclusive, safe, resilient and sustainable. Among the targets that will benefit Turkana County if implemented include ensuring access for all to adequate, safe and affordable housing and basic services. The other target includes UN support for least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials (UN, 2015).

### **2.5.5 New Urban Agenda**

In October 2016, the World's Governments and stakeholders congregated in Quito, Ecuador for the bi-decennial cycle United Nations Conference on Housing and Sustainable Urban Development popularly known as Habitat III. This conference gave an opportune chance to discuss urban challenges and questions such as how to plan and manage cities, towns and villages for sustainable development. The outcome of the conference was adoption of a document dubbed "New Urban Agenda" and a declaration known as "Quito Declaration on Sustainable Cities and Human Settlement for all". This is a roadmap on how building cities that can serve as engines of prosperity and provides guidance on achieving SDGs.

The leaders (National and Local/County Government) committed to provide basic services to its citizens that include access to housing, safe drinking water and sanitation, nutritious food, healthcare, family planning and access to communication technologies. They also committed to ensure that all citizens have access to equal opportunities and face no discrimination; promote measures that support cleaner cities; fully respect the rights of refugees, migrants, internally displaced persons regardless of their migration status among other commitments (UN, 2017).

Consequently, in April 2017, Kenya's State Department for Housing and Urban Development domesticated the New Urban Agenda through Kenya's Popular Version of the New Urban Agenda. The objective of the Popular Version was to contextualize and unpack the global agenda to reflect Kenya's realities and priorities. The two key

commitment of the document is first to ensure urban and rural development that is inclusive and protects the planet and second is strengthening coordination between National Governments and relevant partners towards implementation of this agenda. The Popular Version further states six thematic areas under which the commitments will be implemented. They are housing and basic services; urban and human settlements infrastructure; land, urban and regional planning; urban economy; environmental sustainability and urban governance (Ministry of Transport, Infrastructure, Housing and Urban Development, 2017).

## **2.6 The Role of the Private Sector in the Provision of Low Cost Housing**

Private sector housing is defined as any production, which is not associated in any way with the actions of the state, neither directly constructed by the state nor financially sponsored by the state; where production is not anticipated to have a social element (Golland, 1996). Ambrose and Barlow (1987) have argued that three factors are vital in influencing the level of new house construction. These are direct capital investment by the state for public housing, state support for production and changes in the profitability of house builders in the private sector.

The private sector can play significant role in housing provision if the state offers adequate and appropriate incentives to the sector (Mitullah, 2003). In Kenya, the private sector, both formal and informal, remains the largest producer of housing units in the country. Initiatives by the private sector can be both large-scale and deep in impact, contrary to the government initiatives that may be large-scale but usually limited in impact (Otiso, 2003).

The key motivation that inspires the private sector is profit or potential profitability with profit-maximizing options being in the context of housing production and selling more of them; reducing the cost of production through lower raw material and wage costs and finally, increasing the price of the product (Hancock, 1998). According to Otiso (2003), the private sector can provide living needs to large sections of the population if they

operate within a well-conceived competitive environment. This is where there is a possibility of charging consumers and making a profit, absence of overwhelming impediments such as appropriate technology as well as scale of investment and the existence of competent governments with the capacity to enforce standards, contract fulfillment and service delivery.

## **2.7 Challenges in Housing Development**

Although there has been significant progress in the formulation and implementation of housing policies and to some extent strategies in the past decades as discussed earlier, many constraints still effectively hinder progress in housing development in developing countries, particularly for low income and other vulnerable groups (Erguden, 2001).

The trigger of development activity is an analysis of market opportunities by developers who see demand for new housing, anticipate adequate return on investment, align their resources towards purchase of land and housing production and then sell these housing units with a view to maximizing profits. Profitability in housing is advocated to be based on three variables: house prices, land prices and building costs, where: **Profit = House Prices – {Land Prices + Building Costs}** (Golland, 1996). Key components of housing are land, finance, building materials and construction technologies relating to the costs in the profit model above. Few market developers actively monitor the market for business and profit opportunities but instead respond to market triggers, such as availability of land. As such, the supply of housing may not respond only to market signals and incentives (Macoloo, 1994).

## **2.7.1 Policy and Institutional Challenges**

### **2.7.1.1 Lack of Priority for Housing**

One of the most serious policy constraints to scaling up investments in housing in Africa is that in most countries the sector is not accorded the priority it should command in national development strategies and therefore receives little budgetary resources. Similarly, national governments do not take comprehensive approach when dealing with access to land, infrastructure, finance and legal systems. Some countries propose building a few hundred or a few thousand units, while others propose public–private partnerships and land reform measures. However, many do not include clear measurable goals or budget information (World Bank, 1993).

### **2.7.1.2 Poor promotion of security of tenure**

Promoting security of tenure is a prerequisite for sustainable improvement of housing and environmental conditions. Squatter settlements upgrading projects need to be carried out by addressing tenure issues to prevent/reduce evictions. Governments should focus on regularization schemes to provide incentives to families to invest in their homes and communities. Promoting security of tenure can also support better functioning of rental housing markets. There is no doubt that every effort should be made to make best use of existing housing stock and improve the quality of living in these settlements (World Bank, 1993).

### **2.7.1.3 Role of the Public Sector**

World Bank (1993) opines that by recognizing the limitations of the public sector, several African countries in the recent past have significantly revamped their housing policies to support a much greater role for the private sector in provision of housing. However, the private sector cannot on its own meet the needs of housing and thus the public sector must continue to play an influential role in creating a favorable policy

environment. It also must make critical infrastructure investments necessary to allow the private sector to increase its investment in housing.

According to World Bank (1993), if the government can assure macroeconomic stability and lower inflation, rationally plan for future expansion, provide necessary infrastructure, ease access to urban land and adopt realistic building standards for low cost housing, the private sector has the capacity to raise financing and construct housing at affordable prices. To make this happen, housing ministries must increase the priority of shelter in national planning strategies and in national budgeting exercises.

#### **2.7.1.4 Legal and Regulatory Framework**

The legal and regulatory environments in many African countries remain ill-suited to address the new urban realities and to unleash the private sector's capacity to finance and build shelter at scale. Increasing numbers of African countries are now beginning to recognize the need to change their legal and regulatory environments in such areas as land ownership, registration, use requirements, titling, transfer and ownership rights, foreclosure laws, environmental requirements and financial requirements for lending institutions. While some of them are taking steps to address these issues, progress can be slow as entrenched interests can present obstacles. Corruption can also be a factor as countries make efforts to improve the legal and regulatory environment (World Bank, 1993).

#### **2.7.1.5 Subsidy Policies**

One of the major policy constraints to African countries meeting the housing needs of lower income families is the nature of their subsidy programs. Housing subsidies, if properly targeted, is a good thing. However, subsidies in many African countries do not favor the most deserving. Buckley & Kalarickal (2005) have pointed out that while housing subsidies are in many countries important components of public expenditure, their extent and incidence is generally not well known by governments. This has resulted

in subsidies not proportionately and efficiently being directed to the most deserving people. Improving subsidy systems would allow government systems to be more equitable in serving more households with affordable shelter.

## **2.7.2 Housing Finance Challenges**

### **2.7.2.1 Formal Sector Financial Institutions and Mortgage Finance**

The improving financial climate in many countries in Africa has led to the expansion of mortgage lending in several African countries. The development of mortgage markets is still in its formative years in most African countries and thus interest rates for mortgages are still high. Most of the mortgage financing goes to the middle and upper income classes. While low-income families, that represent the bulk of the potential market, find themselves unable to qualify for conventional mortgage financing (World Bank, 2003).

In Kenya, the country's mortgage market is the largest in the region yet outstanding mortgages to GDP only stand at 2.5%, well below top performing South Africa and Namibia where outstanding mortgages to GDP stand at 26.4% and 19.6% respectively (World Bank 2011). According to a World Bank (2011) affordability simulation, using 2011 interest rates only around 11% of the population could afford a Ksh. 3.2 million mortgages over 15 years. As of 2012, according to the Kenyan Central Bank, the average mortgage across the country was Ksh. 6.6 million, requiring a repayment of Ksh. 90,000 per month over 20 years, well above the earnings of most of the population (CAHF 2012).

### **2.7.2.2 Micro-Finance and Micro-Finance Institutions**

While short-term loans from micro-credit organizations have traditionally been for business purposes, some organizations have recently begun to make housing loans and extend the terms to between three and five years. Such loans are usually not large enough for the purchase of new houses but allow families to improve their existing

housing incrementally as their financial circumstances permit. Formal institutions tend to focus on the upper range of lower income families while the more informal institutions have been able to direct their loans (sometimes subsidized by government or donors) towards poorer clients. While the micro-credit institutions are an increasingly important source of housing finance for lower income groups, most are unable to access long-term funds, which would allow them to achieve significant success (World Bank, 2003). Lacking collateral, the guarantee of regular and recorded income, the low-income groups depend completely on informal credit sources, which are expensive and mostly short-term (Macoloo, 1994).

### **2.7.3 The Constraints to Affordable Housing in Kenya**

A study conducted by the Ministry of Housing established that land, finance, building materials and a practical regulatory framework are the main constraints to affordable housing in urban areas. In the rural areas, it is mainly water, finance and building materials that pose the greatest challenge. The developer, the design and procurement process (conceptualization, manufacturing and construction) cannot be ignored as the design team, the contractor and his sub-contractors all seek to be paid, over and above their costs (Nabutola, 2004).

#### **2.7.3.1 Land Constraints**

According to Erguden (2001), lack of adequate land especially for urban development and particularly for low-income housing is the single most important impediment in achieving the goal of shelter for all. It is estimated that only about 1 per cent of land in the Sub-Saharan African countries are covered by any kind of cadastral system. Scarcity of land leads to escalating land prices, overcrowding of existing neighborhoods, illegal invasion of vacant land and growth of squatter settlements.

This is particularly true of the urban areas because the land is highly valued and is mostly in the hands of the national and county governments. The only other landowners are speculators seeking to make big profits. This makes land inaccessible to the majority who need it most but cannot afford its premium price (Nabutola, 2004).

### **2.7.3.2 Financial Constraints**

According to Nabutola (2004), the financial set up in the housing market in Kenya as just like elsewhere is such that those offering funding seek to make a profit and declare dividends for the shareholders because that is what they are in business for. The money market is expensive due to relatively higher risks that raise interest rates. The exception is the central government and the county governments who have obligation to provide decent housing for all their citizens. Unfortunately, for a variety of reasons the revenue collected through taxes and service charges is not sufficient to cover housing needs, as there are other priorities. Other strategies must be devised to address the large, growing gap between what is needed, and what is offered.

### **2.7.3.3 Regulatory Framework**

Kenya's outdated 1968 Building Code that is currently in operation and which is out of focus with the current realities does not allow the inclusion of newer construction technology that is instrumental to the provision of low cost buildings. The building code requires contractors to adhere to narrow specification of materials and designs suitable for only one class of house construction that is not only costly but time consuming and which are no longer in use in developed countries (Macoloo, 1994).

### **2.7.3.4 Lack of effective implementation strategies**

This is the first and most important step in the challenge of adequate shelter for all. The key for overcoming these constraints is to promote an effective facilitative role to harness the full potential of all actors in housing production. Most governments in the

developing world have adopted enabling shelter strategies and initiated actions to support the actors in the housing delivery process. There is however extensive room for improvement in this area and close the gap of what is on paper as a policy document and what is really happening on the ground (Erguden, 2001).

#### **2.7.3.5 Inadequate Infrastructure and services**

Financing and facilitating infrastructure to meet basic needs of many communities have been difficult for most national and county governments. This is, in most cases, due to the high standards that make provision of infrastructure very costly. Too often, infrastructure services are unnecessarily subsidized and frequently the subsidies are wrongly directed. As public authorities have not been able, in general, to provide infrastructure to the growing number of communities, individual households, community groups and informal enterprises have increasingly taken over this task (Erguden, 2001).

#### **2.7.3.6 Utilization of Alternative Building Materials and Technologies**

Building materials often constitute the single largest input to housing construction in Kenya. It is estimated that the cost of building materials alone can take up to 70 per cent of a standard low-income formal housing unit. Many African countries, even though they are endowed with abundant natural resources that can meet their need for building materials production, depend largely on imported building materials and technologies. While considerable research is conducted in Kenya on local building materials, only few of these research initiatives have succeeded in disseminating findings to the potential users (Erguden, 2001).

#### **2.7.3.7 Promotion of community participation and self-help**

Policies and practices of provision of ready housing units by governmental agencies to the needy households have failed almost everywhere. This approach is simply not sustainable and cannot reach the scale. On the other hand, the poor have demonstrated

that they can effectively participate in the housing process if they are assisted. Most rural migrants bring with them a self-help tradition that could be used for the construction of dwellings. Self-help and community participation however does not develop by itself. Successful community involvement requires support from the public sector such as provision of training, credit and technical assistance (Erguden, 2001).

## **2.8 Summary of the Review**

Housing as a unit of the environment has profound influence on the health, efficiency, social behavior, satisfaction and general welfare of the community. Low cost housing development is being implemented in developing countries to improve quality of life and provide protection from adverse climatic change impacts. Housing development has multiplier effect on the other sectors of the economy including job creation and other opportunities for home-based income earning activities.

However, no country can be said to be satisfied with being able to provide adequate housing for the whole spectrum of its population more so in developing countries where budgetary allocation is taken up by more “critical” sectors of the economy. The challenges experienced in trying to bridge the gap between demand and supply of decent housing especially for the low segment of the populace can be summarized in to the following variables:

### **2.8.1 Traditions and Nomadism**

The Turkana community in Kenya just like their cousins Maasai is still, to a large extent, closely governed by a commonly held traditional value system. These values include kinship, livestock myth, social ties and traditional education. These values have in turn influenced who, how and with what resources the settlements neighbourhoods and residential places are determined and built. At homestead level, these have led to characteristic courtyards, pragmatic enclosures and socially and culturally well thought out interior spaces, which are associated with the Turkana housing. On broader

perspective, Turkana shelter issues include types of technology, social and cultural uses of houses, division of labour and attitudes towards different technologies (Rukwaro, & Maleche, 1995).

The indigenous Turkana house is not only a physical structure to shelter people and young animals, it is also an economic and social sub-unit of an individual family. They are built by women, never by men, using locally available materials in that posts, twigs, soil, palm leaves and grass. These materials are locally assembled and are free of charge. These huts are built temporarily because the husbands are always in search of pasture and hence the structures would be used as long as there is pasture within a given radius. There is therefore no need to build very permanent houses and men are not involved since they were mostly away and hence women repair the deteriorating structures particularly during the rainy season (Rukwaro & Maleche, 1995).

### **2.8.2 Income levels**

Turkana County is one of the counties that had been marginalized for a very long time consequently making it the poorest county in the country (KNBS, 2018). Subsequently, low-income levels and limited buying capacity of most of the residents cannot afford any decent shelter leave alone to meet other basic needs like food and clothing.

### **2.8.3 Subsidy Policies**

If there is a county that need housing subsidies is Turkana County. However, even though it is disadvantaged, the housing subsidies are not forthcoming or do not favor the most deserving. Improving subsidy systems would allow systems to be more equitable in serving more households with affordable shelter.

### **2.8.4 Land Tenure**

The Government in trust for the Turkana people holds most land in Turkana County. This implies that the right of all individuals and groups of Turkana against forced

eviction is compromised. Since majority of the population do not have titles deeds for the land in which they live in, they cannot access financing from the mainstream lenders, who require titles deed or lease as collateral.

### **2.8.5 Housing Infrastructure and Services**

Turkana County is a vast county with sparse population of 13 persons per square kilometre. Consequently, key infrastructure and services are only found in towns. The infrastructure and services that are key to decent living include clean drinkable water, roads, energy sources, communication, social services, waste management and disposals. Lack of infrastructure also leads to high cost of transportation making construction materials expensive for the locals. Financing and facilitating infrastructure to meet basic needs of many communities have been difficult for many governments and local authorities. This is, in most cases, due to the high standards that make provision of infrastructure very costly (Erguden, 2001).

### **2.8.6 Housing Finance**

The mortgage intake in Kenya is still very low and is almost nonexistent in Turkana because of lack of consistent income acceptable to the mortgage providers. One way that can rope in the locals to the mortgage bracket is by letting them repay their mortgage with proceeds from the main economic income, which is pastoralism.

### **2.8.7 Building Materials and Technologies**

Although there is utilization of local materials and technologies such as makuti and sand blocks in building their shelter, Turkana people do not view them as superior materials. This skepticism affects the delivery of decent low-cost housing. It is worth noting that building materials often constitute the single largest input to housing construction in Kenya. It is estimated that the cost of building materials alone can take up to 70 per cent of a standard low-income formal housing unit. While considerable research is conducted

in Kenya on local building materials, only few of these research initiatives have succeeded in disseminating findings to the potential users (Erguden, 2001).

### **2.8.8 Government Incentives**

The role of government in low-income housing is critical and national leaders have a legal and social responsibility to provide services in return for political support. Its mandate is to facilitate the development and management of quality affordable shelter for Kenyans, develop housing policies and incentives, and carry out slum upgrading/eradication programs. Kenya has been unable to meet these needs because of administrative, financial, and institutional weakness together with poor planning and rapid population growth. There is the contention that lack of sufficient funds is one of the main reasons for the poor housing conditions in urban areas and available national funds are competed for by various sectors of the economy. Sectors such as security, agriculture, education and health are traditionally financed every year as they are categorized as critical and productive sector. The definition of productive sectors has always excluded housing provision, particularly for the low-income households (Macoloo, 1994).

### **2.8.9 Security**

As Nabutola (2004) rightfully puts it, embedded security is a vital component of housing provision and is fundamental to the success of any housing scheme. Effects of insecurity manifest itself in different forms such as influx internally displaced persons, which brings about mirade of challenges equivalent to those posed by refugees and thus feeds in to poverty cycle. Housing suffers whenever there is strive as the investors put in investment in peaceful havens.

### **2.8.10 Information**

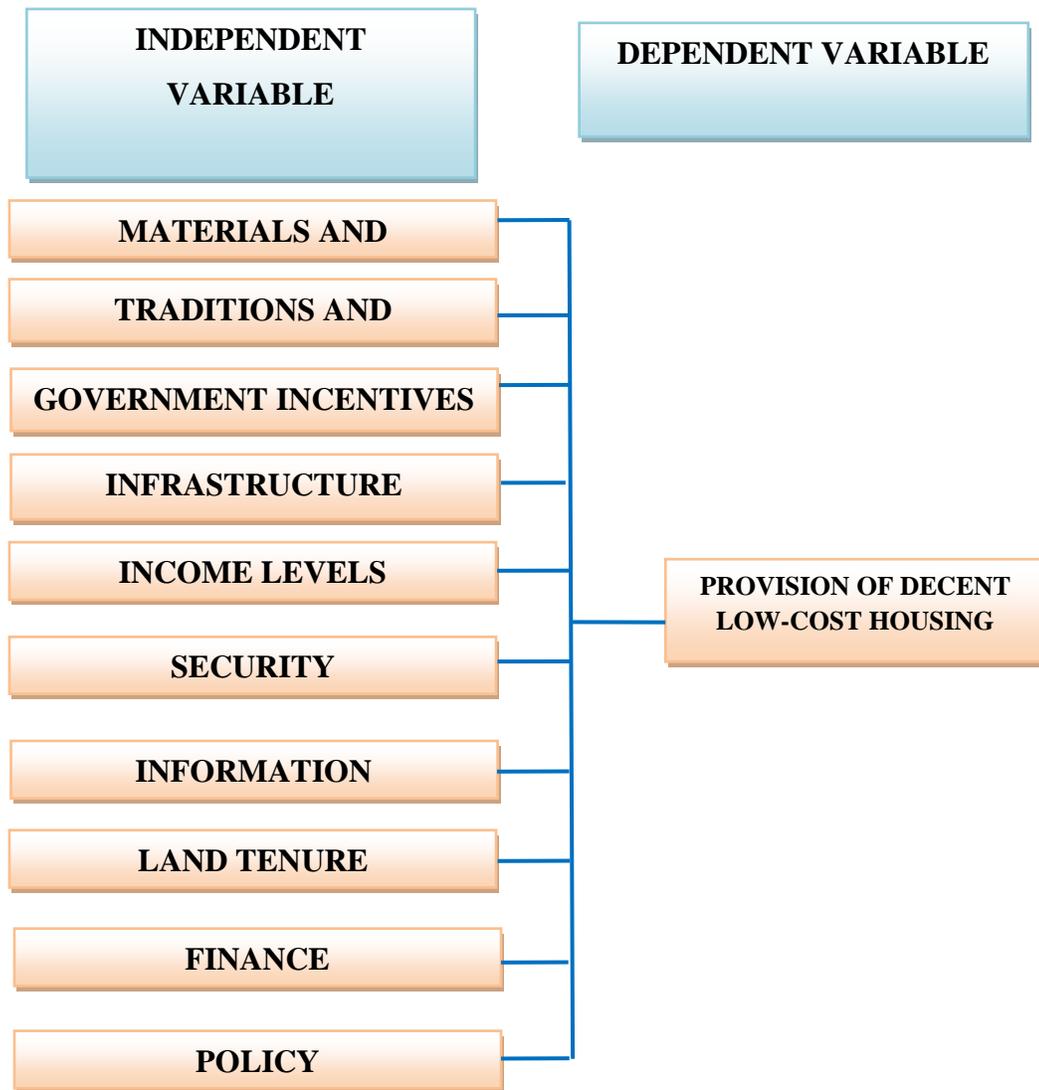
There is critical information that can be beneficial to housing development but do not reach the intended recipients. Such information includes available materials, technologies, regulatory framework, subsidies and incentives that can be utilized by developers to enhance the quality and quantity of stock among others. For example, corporation tax due from developers constructing at least 100 low-cost housing was reduced from 30% to 15%. Similarly, first time homebuyers are now exempt from stamp duty a major expenditure in property acquisition. All these are meant to give incentives to the low-cost housing segment. Such information ideally should reach the intended audience including Turkana people failure to which the housing development is affected.

### **2.9 Research Gap**

A lot of research has been carried out locally and internationally seeking to establish the challenges facing construction of decent and affordable houses. Most of these researches revolve around challenges and problems associated with slums or urban sprawl and proposed solution thereof in big cities and its periurban areas as opposed to holistic coverage. The successes of the theories and low-cost housing herein articulated has only been well documented in the urban setting while those outside urban areas has not been. There is scarcity of literature touching on the housing for marginalized communities. Therefore, the thesis will build on the local literature on challenges in the provision low cost, affordable housing in marginalized area.

### **2.10 Conceptual Framework**

Figure 2.1 illustrate the relationship between provision of decent low-cost housing (dependent variable) and challenges that affect provision of the decent low-cost housing (independent variables).



**Figure 2.1: Conceptual Framework**

Source: Author, 2018

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the research design and methodology that was used to conduct the study and is focused on research design adapted for this study, target population, sample and sampling procedures employed, research instruments as well as techniques used in data collection and analysis and presentation.

#### **3.2 Research Design**

Research design is the glue that holds together elements in a research project (Kombo & Trump, 2006). The research design used for this study is the descriptive design. Descriptive research designs are used to gather pertinent and precise information concerning status of a phenomena and to describe what exists and whenever possible to draw valid general conclusion from the facts discovered. Since descriptive research spans both quantitative and qualitative methodologies, it can describe events in greater or less depth as required (Anastas, 1999).

This study was conducted in its complete natural environment that yielded rich data that describe housing conditions in Turkana County aimed at discovering inferences or relationships. This utilized data collection and analysis techniques that generated report concerning the measures of central tendency, variation, and correlation that will be of interest to policy makers, decision makers and will contribute to knowledge. The researcher was able to ask questions whose responses were given using the Likert scale of “Always”, “Often”, “Sometimes”, “Rarely”, and “Never” and “Extremely”, “Majorly”, “Moderately”, “Slightly” and “Not at all”. A final open-ended question of “What strategies should be put in place to improve provision of affordable low cost and

decent houses in Turkana County” was requested in the questionnaire to generate qualitative data to provide context.

### **3.3 Research Strategy**

Turkana County has the largest number of people categorized as homeless after Nairobi and Mombasa counties (KNBS, 2012). Considering that the later two are counties that are predominantly urban, the Turkana situation turns out to be critical. The houses dotting this expansive county can be qualified as being deplorable and not decent. To understand and find the underlying cause of this problem and come up with actionable solution, the households were engaged through the questionnaires to give their views and understanding on various aspects about housing situation in Turkana County. They were asked to rate different aspects of housing ranging from quality, materials in use, financing mechanism for Turkana and the challenges that bedevil development of housing in Turkana County.

### **3.4 Study Location**

The study was carried out in Turkana County, Kenya. Turkana County is in what was once Rift Valley Province and borders South Sudan and Ethiopia to the north, northeast respectively, and Uganda to the west. It also borders Baringo and West Pokot Counties to the south as well as Samburu County to the southeast. Lake Turkana divides it with Marsabit County to the east. The County covers an area of 68,680 square kilometers and has six administrative sub-counties namely Turkana Central, Turkana South, Turkana East, Turkana North, Turkana West and Loima.

The study was intended at understanding the challenges faced in the provision of affordable housing in Turkana County. The results could cautiously be generalized for other semi-arid regions of Kenya. The other counties sharing big resemblance with Turkana County and who stand to benefit from this study include Mandera, Wajir, Marsabit, Samburu, West Pokot, Narok, Garissa and Isiolo.

### 3.5 Population, Sample and Sampling

#### 3.5.1 Target Population

Target population is defined as all the members of a real or hypothetical set of people, events or objects to which a researcher wishes to generalize the results of the research study (Borg & Gall, 1989). The target population for this study was all the 123,192 households in Turkana County (KNBS, 2013). A household in this context is a social unit composed of those living together in the same dwelling where the researcher was interested in researching, analyzing and generalizing finding.

#### 3.5.2 Sampling Size and Sampling Procedures

The sampling procedures employed means selecting a given number of subjects from a defined population as representative of that population. Since the target population of 123,192 was significantly big, Krejcie & Morgan (1970) formula was used to determine the sample size. According to Krejcie & Morgan (1970) in determining sample size for research activities, a population of more than 75,000 gives a sample size of 382 using this formula:

$$n = \frac{X^2 \times N \times P \times (1 - P)}{(ME^2 \times (N - 1)) + (X^2 \times P(1 - P))} \dots\dots\dots \text{Equation 3.1}$$

Where:

n = required sample size.

X<sup>2</sup> = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = the population size.

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

ME = the degree of accuracy expressed as a proportion (0.05).

For the study, with a target population of 123,192 households, the sample size was determined as follows:

$$n = \frac{3.841^2 \times 123,192 \times 0.5 \times 0.5}{(0.05 \times 0.05 \times 123,192 + (3.841^2 \times 0.5 \times 0.5))} = 382$$

**Sample size = 382 Households**

The study adopted proportional stratified random sampling to ensure that the sub-counties with the highest population of households also had more numbers in the sample. Therefore, households Turkana County were sampled for this study as follows:

**Table 3.1: Sample frame**

<b>SUB COUNTY</b>	<b>TARGET POPULATION</b>	<b>SAMPLE SIZE</b>
Turkana Central	19,401	60
Turkana South	19,579	61
Turkana East	13,032	40
Turkana North	18,596	58
Turkana West	35,306	109
Loima	17,277	54
<b>TOTAL</b>	<b>123,191</b>	<b>382</b>

**Source: KNBS, 2013**

The sample was purposively determined with consideration to proximate distance from sub-county administrative headquarters. Not more than one respondent was served with questionnaire in each household.

### **3.6 Research Instruments**

Research instruments refer to devices used to collect data and they include questionnaires, tests, structured interview schedules and checklists (Seaman 1991). Questionnaires were the research instruments of choice this study.

#### **3.6.1 Questionnaires**

Polit and Hungler (1997) define a questionnaire as a method in which information is gathered from respondents about attitudes, knowledge, beliefs and feelings. The questionnaire used in this study was designed to collect data from households. It offered considerable advantages in the administration where each participant entered his/her responses on the questionnaire thus saving the researcher's time. It was also less expensive, and respondents felt that they remain anonymous and thus expressed themselves in their own words without fear of identification. Anonymity helps to produce more candid answers than is possible in an interview. It presented an even stimulus potentially to large numbers of people simultaneously and provided the study with an easy accumulation of data. Gay (1992) maintains that questionnaires give respondents freedom to express their views or opinion and to make suggestions.

The questionnaire for this study was divided in to three sections. The first section was to gather background information of the respondents on gender, age and general quality of housing. The second section was to collect information on the challenges of housing development in Turkana County especially on quality, financing, construction materials and technologies as well as the impacts it has on the residents of this county. The third section, the respondents were to rank the most challenging factors in the provision of

housing and give their opinion on what should be done to increase housing stock in Turkana County.

The respondents were visited in their places of residence and questionnaires administered to them. They were given approximately twenty minutes each to fill in the questionnaires after which the filled-in questionnaires were collected. Respondents who did not know how to read and write were taken through the questionnaire with the help of a local intermediary.

### **3.6.2 Pilot Study**

Before the main study, a pilot study was carried out on 27 respondents in the six Sub-Counties. This was to pre-test research instruments in that the questionnaire. After assessing whether the research protocol is realistic, workable and establishing whether the sampling frame and technique are effective, the instruments were revised for main study.

## **3.7 Sources of Data**

### **3.7.1 Primary Data**

According Kothari (2004), primary data is information collected by a researcher specifically for a research assignment and is original in nature and directly related to the issue or problem and current data. The source of primary data for this research was obtained from the administered questionnaires of sampled households. The data is current and gives realistic view to the researcher about the quality and conditions of housing and the challenges bedeviling housing sector in Turkana County. Appendix 1 outlines the structure of the sample questionnaire used to gather this information. The questionnaire document was designed to facilitate easy and short answering of questions by the respondent based on their view of the housing sector condition in Turkana County.

### **3.7.2 Secondary Data**

Secondary data is any data that has been collected and aggregated by anyone other than the user and have already passed through statistical process. Methods of collecting secondary data are merely that of compilation (Kothari, 2004). There are several sources of secondary data that was used in compiling this study majority of it being in the second chapter of this report. They include Government records available in the form of government surveys, constitution document, legislations, tax records, policies, census data and other statistical reports, as they were easily available and very useful in this study.

Other sources were published data obtained from various sources like books, magazines, newspapers, journals, university research reports and periodicals. Published data is the most reliable secondary source of information, as the validity of published data is greater than unpublished data.

Private sector organization such as banks, real estate companies and NGOs keeps records. These records can be published or unpublished, but they carry information that cannot be obtained from other sources and were very handy in this study. E-books, e-journals, e-periodicals and e-magazines were obtained from the internet, as the internet is a multiple source of information. International agencies such as World Bank, IMF, UNDP, UN Habitat, Human Rights Organizations and ILO produce a plethora of secondary data that proved extremely useful in this study.

### **3.8 Data Analysis and Presentation**

The data collected was edited for accuracy, consistency and completeness. After data cleaning, the data was entered in the computer for analysis using the Microsoft Excel. The data collected was largely on the Likert scale and was of the ordinal level. The respondents were asked to rate various statements by choosing between “extremely”,

“majorly”, “moderately”, “slightly” and “not at all” or “always”, “often”, “sometimes”, “rarely” and “never”.

The study yielded both qualitative and quantitative data. Qualitative data was analysed using content analysis based on analysis of meanings and implications emanating from respondents’ information and documented data and is presented in discussions thereof. As observed by Gray (2004) qualitative data provides rich descriptions and explanations that demonstrate the chronological flow of events as well as often leading to unforeseen findings.

For quantitative data, simple descriptive statistics were used to analyze data by way of frequency counts. Quantitative data are presented in tables, frequencies and percentages.

### **3.9 Authorization**

Authorization was sought from National Commission of Science, Technology and Innovation (NACOSTI) who issued the researcher with research permit was issued, at the County level, further clearance was sought from Turkana County Commissioner and Turkana County Director of Education before the data collection was undertaken.

## **CHAPTER FOUR**

### **DATA ANALYSIS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents the results of the study, data analysis and discussion. The study sought to find out challenges facing construction of low cost decent housing in Turkana County, assess the impact of the challenges and lastly, suggest a housing policy agenda that addresses the challenges identified in the provision of low cost decent housing. The chapter gives the data analysis output in the form of charts, figures and tables.

Quantitative data are presented in tables, frequencies and percentages. The source of all the tables and figures herein were obtained from this study. The data collected was largely on the Likert scale and was of the ordinal level. The respondents were asked to rate various statements by choosing between “extremely”, “majorly”, “moderately”, “slightly” and “not at all” or “always”, “often”, “sometimes”, “rarely” and “never”. Quantitative data obtained from the questionnaires are presented in tables, frequencies and percentages as shown hereafter. Qualitative data are presented in discussions. The chapter is divided into descriptive statistics and inferential statistics.

#### **4.2 Response Rate**

Response rate is the extent to which the final data set includes all sample members and it is calculated as the number of people with whom dully filled questionnaires are returned, divided by the number of people in the sample (Fowler, 2009). A sample of 382 was selected using proportional stratified random sampling technique. A total of 382 questionnaires were distributed to various households in the six Sub-Counties of Turkana County namely: Turkana North, Turkana South, Turkana East, Turkana Central, Turkana West and Loima. Out of the sample covered, 311 were responsive

representing a response rate of 75%. This is above the 50% which is considered adequate in descriptive statistics according to Mugenda and Mugenda (2012)

### **4.3 Description of Challenges**

#### **4.3.1 Gender of Respondents**

The study sought to establish the gender distribution of the respondents and the findings are presented in Table 4.1.

**Table 4.1: Gender of respondents**

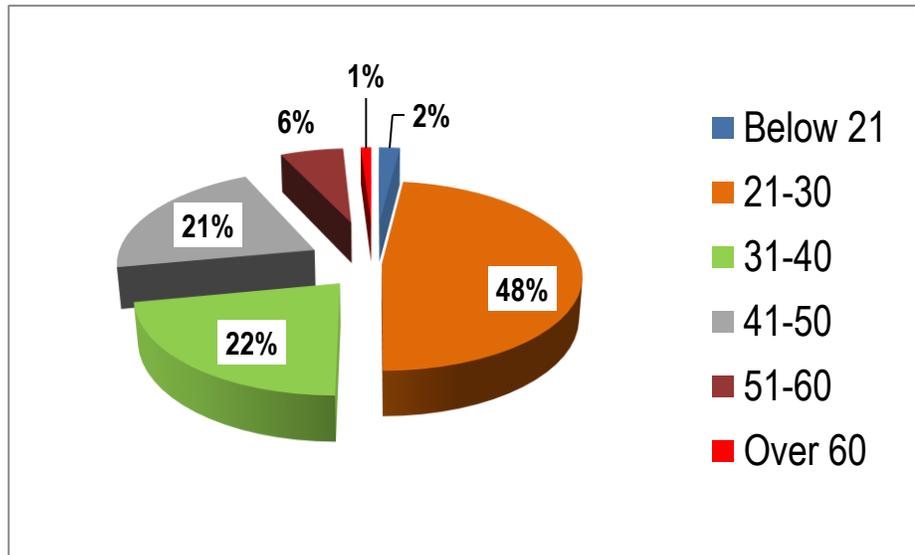
<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Male</b>	249	80%
<b>Female</b>	62	20%
<b>Total</b>	<b>311</b>	<b>100%</b>

**Source: Author, 2018**

From the results, both male (80%) and female (20%) respondents participated in the study as shown. However, the statistics show that the male gender could be dominating the matters housing in Turkana County.

### 4.3.2 Age of Respondents

The distribution of the respondents by age was as depicted in Figure 4.1.



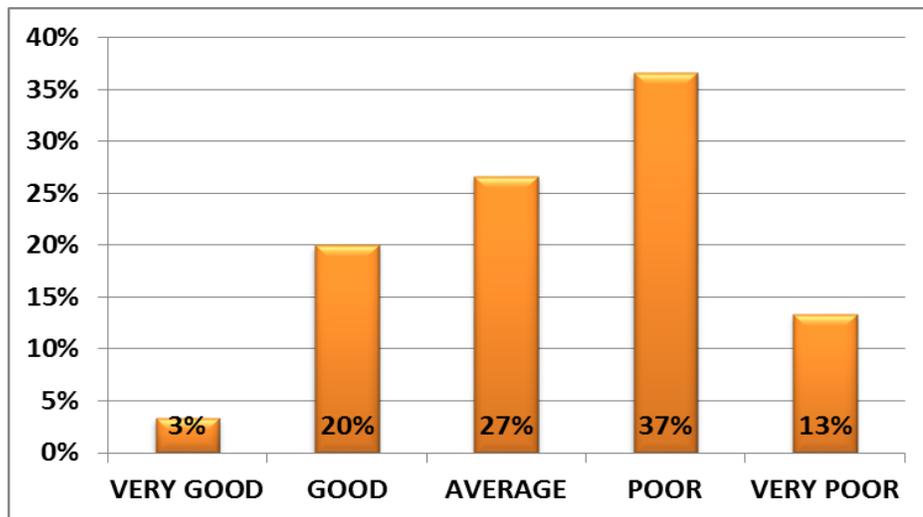
**Figure 4.1: Percentage distribution of respondents by age (Source: Author, 2018).**

From the results, respondents of all ages took part in the study as shown. Majority of the respondents (48%) were between the age of 21 and 30 years. This may be attributed to their awareness on the right to decent housing and desire to live in better shelter. This group is also not held back by too much traditions and nomadism. The right attitude to decent housing should be cultivated in this younger generation.

This category also forms a perfect market for housing development that can be utilized by the developers. Being the most proactive, productive and educated age group, they are the right target group to drive the message of housing improvement in Turkana County. Despite that, majority of this group are either still pursuing their studies or seeking employment and thus do not have the financial capability and opportunities available to them to build decent housing.

### 4.3.3 Quality of Housing in Turkana County

The respondents were asked to rate the quality of existing housing in Turkana County and the results are as shown in Figure 4.2.

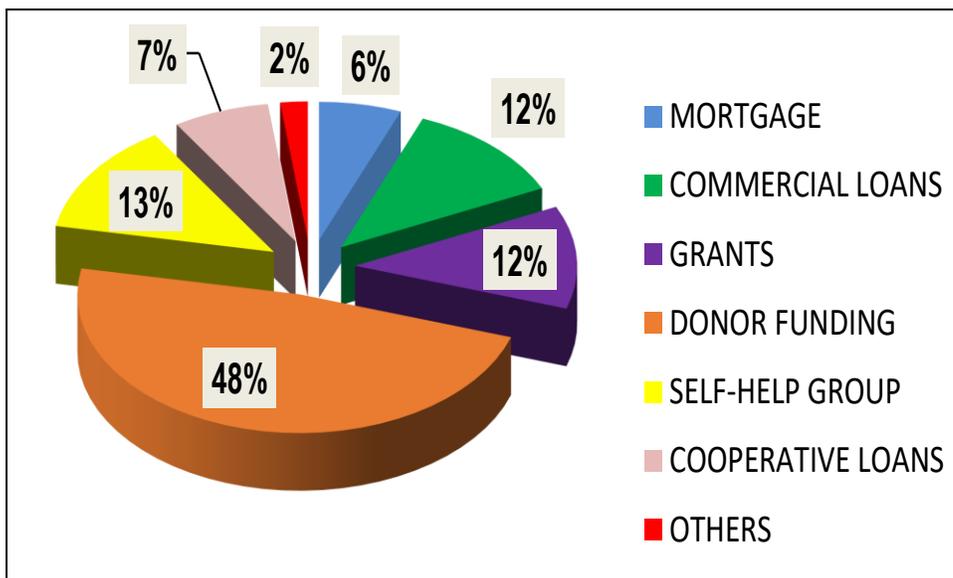


**Figure 4.2: Quality of housing in Turkana County (Source: Author, 2018).**

The statistics show that majority of the respondents (37%) believed housing in the county is of poor quality. In fact, a half of the respondents rated quality of housing in Turkana County to be either poor or very poor. This paint a grim picture of the housing situation in Turkana County. Nevertheless, this category of respondents depicts a population yearning for better shelter. On the flipside, a significant number of respondents (27%) believe housing in this county is of average quality. Average quality does not encourage improvement as people feel they have enough and no need for modern development.

#### 4.3.4 Types of Housing Finance

The respondents were asked to pick what in their opinion is the most appropriate mode of financing housing development in Turkana County. As depicted in Figure 4.3, most respondents (48%) believe donor funding is the most suitable form of financing housing development in Turkana County.



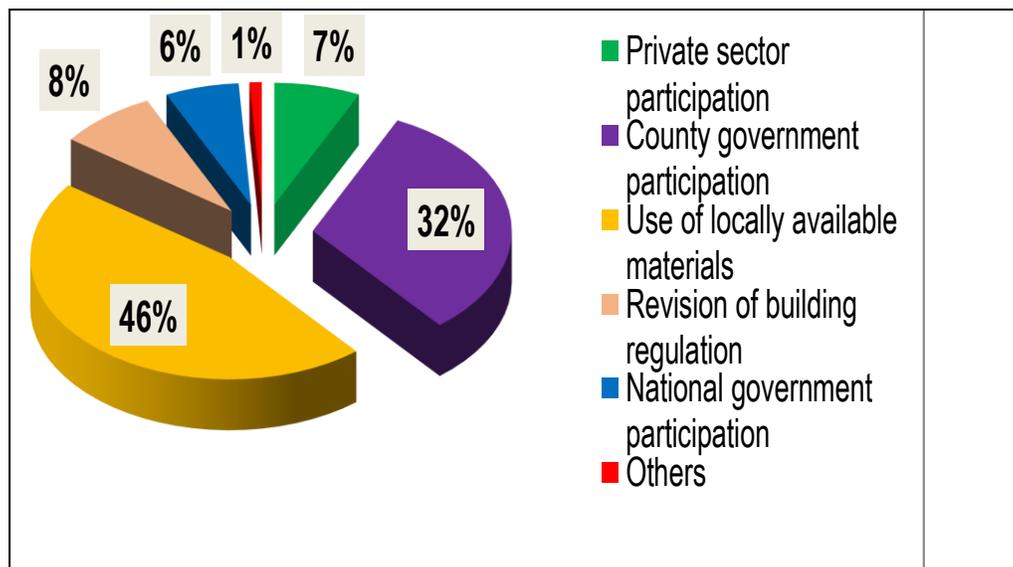
**Figure 4.3: Percentage distribution of type of housing finance most suitable for Turkana County (Source: Author, 2018).**

This can be attributed to the continued years of over-dependence of the people of this County on relief or donations for their most basic needs like health care, food and water and thus developing dependency syndrome. However, self-help groups at 13%, commercial loans and housing grants at 12% each also had strong support from the respondents.

Although mortgage funding is the most suitable form of housing finance, it is the least popular in Turkana County at 6%. These statistics agree with the situation in Kenya

where there is low penetration of mortgage in the market with only 2.5% of outstanding mortgages to GDP. Although high by continental standards, it is short of leading African countries such as South Africa and Namibia where outstanding mortgages to GDP stand at 26.4% and 19.6% respectively (World Bank 2011, CAHF 2012). This scenario can be attributed to low incomes levels, high interest rates, high inflation, the inability of the financial markets to cater for long-term funding and stringent requirements to qualify for this financing key among them title deeds.

#### 4.3.5 How the Problem of Housing should be tackled in Turkana County



**Figure 4.4: How the problem of housing should be tackled in Turkana County (Source: Author, 2018).**

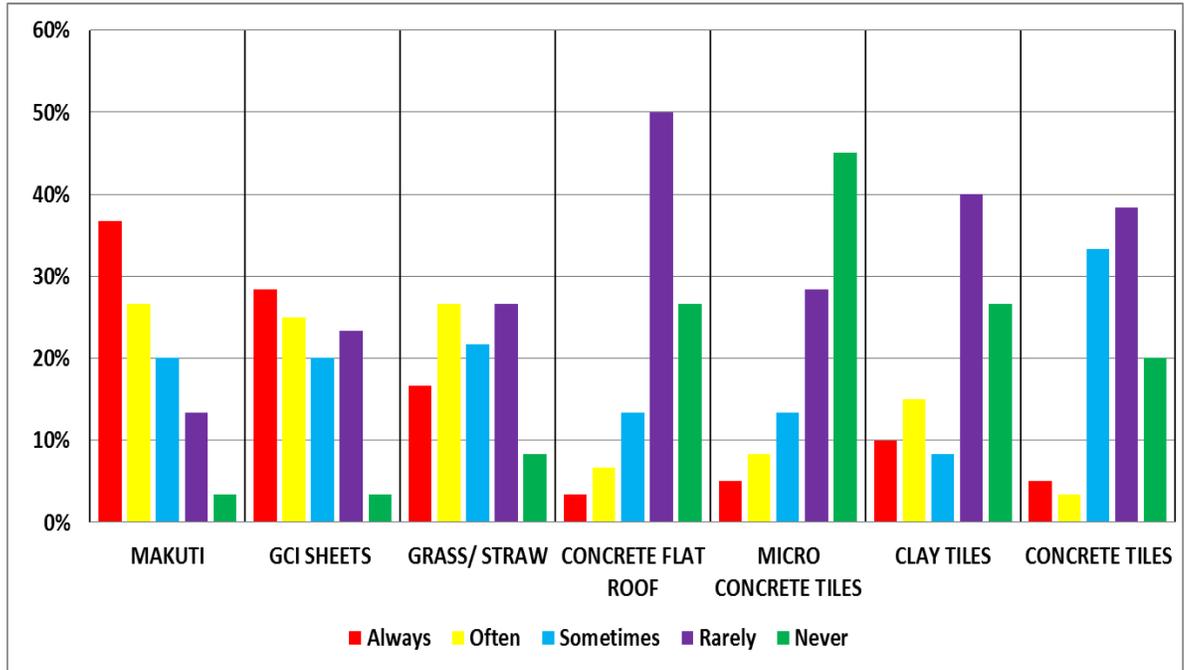
On how best the problem of housing should be tackled, majority (46%) of the respondents believe this can be done by utilizing locally available materials as illustrated in Figure 4.4. This is in tandem with what the proponents of use of locally available materials and technologies have been propagating. By using the locally available

materials, there are cost savings benefits to the users as compared to imported materials. As Erguden (2001) rightfully puts it, building materials often constitute the single largest input to housing construction in Kenya and it is estimated that the cost of building materials alone can take up to 70 per cent of a standard low-income formal housing unit. That cost can be reduced significantly if the locals use locally available materials.

As would be expected, 32% of the respondents are of the view that the County Government should be more proactive in the provision of housing. This is one mandate of county governments enshrined in the COK (2010). Housing planning and development is the responsibility of the County Governments while policy function is the preserve of the National Government. There was no marked difference in the provision of housing by revision of building regulations, central government participation and private participation.

#### **4.3.6 Roof Construction Technologies/Materials in Use in Turkana County**

To gauge the quality of housing stock in Turkana County, the respondents were asked to rate the preferred construction technologies or materials listed. As depicted in Figure 4.5, the respondent data analysis revealed that *makuti* is the most used roof construction technology followed closely by galvanized iron sheets and grass/straw.

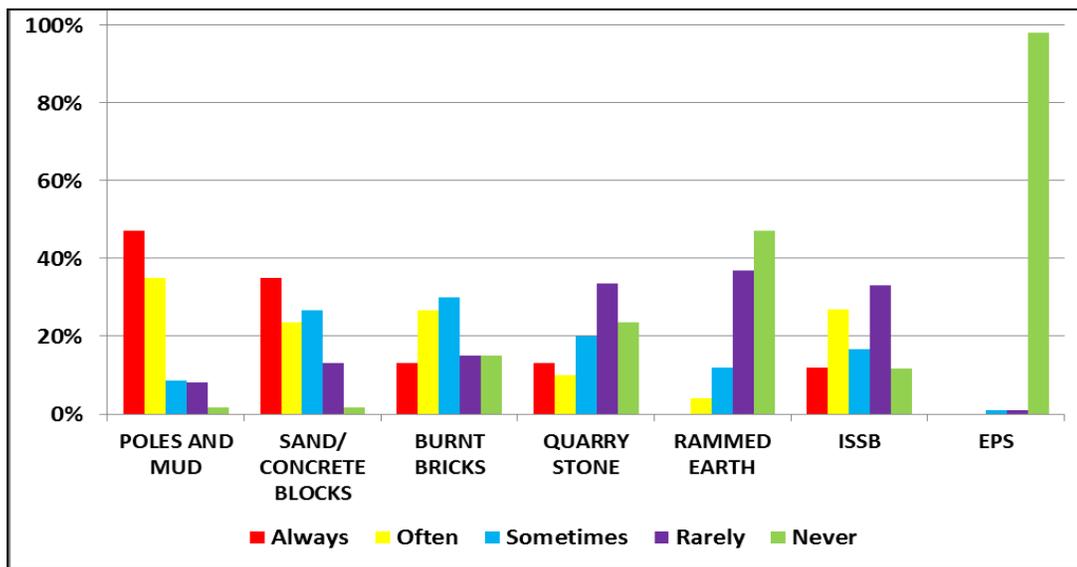


**Figure 4.5: Roof construction technologies/materials (Source: Author, 2018).**

Although *makuti* is not durable due to susceptibility to harsh weather and pest attack, it is locally available materials especially along the rivers and shores of Lake Turkana. Further, most of the respondents revealed that galvanized iron sheets are evenly distributed in terms of their use. Other materials with minimal presence in Turkana County are clay tiles, concrete tiles, micro-concrete tiles and concrete flat roofs.

#### **4.3.7 Wall Construction Technologies/materials**

On walling, the respondent data analysis revealed that poles and mud are the most preferred wall construction materials followed by sand/concrete blocks. These findings are represented in Figure 4.6 and are consistent with the scenario of use of locally available materials in housing provision.



**Figure 4.6: Wall construction technologies/materials (Source: Author, 2018).**

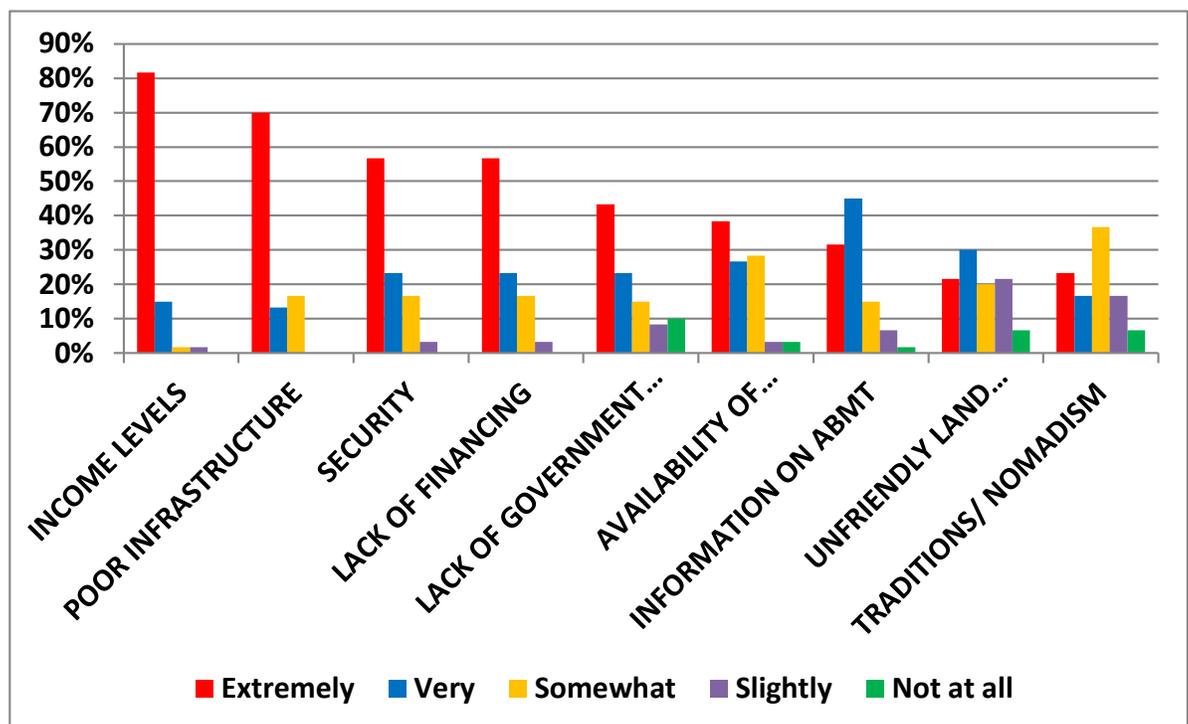
This is informed by availability in Turkana County of poles, sand and clay. If these materials and technologies are to be effective, they should be improved to be durable and attractive. The locals can also be trained on how to build in these improved technologies.

Alternative technologies such as rammed earth and EPS seem not to have penetrated this county. However, ISSB and burnt bricks are alternative technologies that have a significant presence in this county. There have been little or no efforts towards promotion and funding of collaborative research on the development of low cost building materials and construction technologies especially for this far flanked County. Where there has been research, dissemination of information does not trickle down to the intended audience. For instance, use of ISSB, a cost effective and sustainable technology should be encouraged to spur development of housing. On the other hand, burnt bricks are significantly being used in this county although mode of production is not friendly to the environment in a county with little tree cover.

## 4.4 Challenges Facing Provision of Low Cost Housing

### 4.4.1 Extent to which Factors Affect Provision of Housing

To determine the challenges faced in the provision of housing in Turkana County, the respondents were asked to rate different factors and how they affect provision of housing development. As illustrated in Figure 4.7, the survey revealed that low income levels of the people of Turkana County is the biggest hindrance to the provision of housing with 82% of the respondents affirming this.



**Figure 4.7: Extent to which factors affect provision of housing (Source: Author, 2018).**

With poverty index of 79.4% (KNBS, 2018), decent housing can never be a priority ahead of other pressing needs such as food. The Governments world over such as Malaysia have developed housing schemes targeted at low-income segment of the

economy and thus Turkana Country requires such intervention. Similarly, poor infrastructure in the county has greatly affected provision of decent housing. The infrastructure lacking in the county include good roads, reliable clean water supply and sewer trunk line.

Materials for construction can take up to 70% of the total cost of a unit. With the poor state of the roads, by the time imported materials reach the end user it would be too expensive for the user to afford. Lack of other basic infrastructure like water and energy compromises decency of the available housing. Another challenge that came out strongly during the study is security. Fifty seven percent of the respondents believe that security is a key factor for development of housing in Turkana County. For a long time, this county has experienced cases of insecurity with main problem being livestock theft pitting Turkana residents and their neighbors. With such, no meaningful development can take place as this exacerbates the already dire poverty situation in this County. It is only natural that developers willing to invest in housing development cannot be attracted to areas where instability is evident.

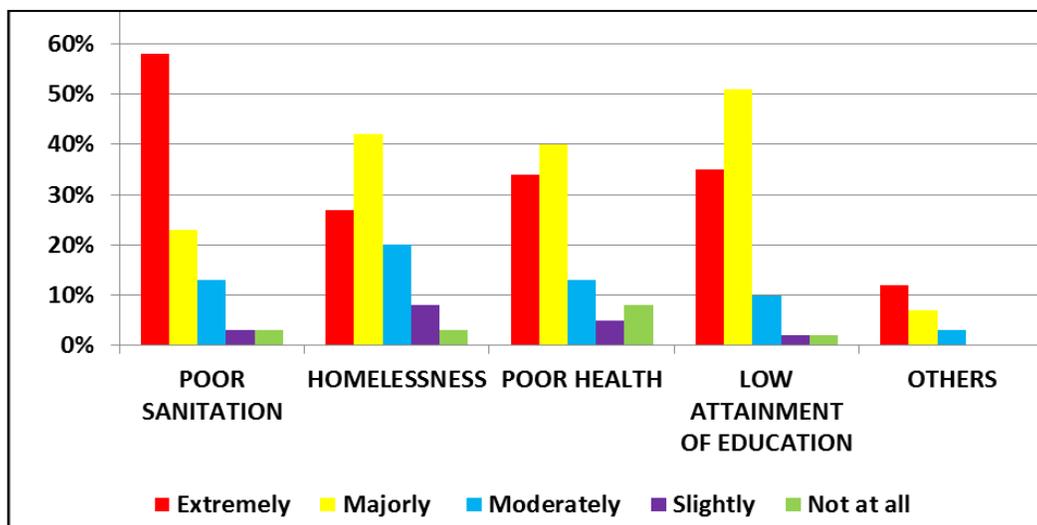
Lack of financing also featured prominently with 57% of the respondents believing that it is a hindrance to housing development in this county. This statistic is true considering the people of Turkana are pastoralist meaning their line of credit is limited as the main lending institutions will categorize them as high-risk borrowers since such institutions require traditional/tangible collateral such as title deed and fixed assets. This is also in line with Ayedun and Oluwatobi (2011) assertion that finance is one of the major factors affecting shelter in Nigeria.

Lack of government incentives (43%) and availability of building materials (38%) are the other factors that affect the provision of housing in Turkana County. Incentives targeted at the housing sector development are very important direct government involvement in enabling residents acquire decent housing. The residents of Turkana County are aware of this and that is why they feel they neglected.

## 4.5 Impacts of the Challenges in the Provision of Low Cost Decent Housing

### 4.5.1 Impacts Attributed to the Challenges in the Provision of Low Cost Decent Housing

The respondents were asked to rate different impacts that can be attributed to the challenges in housing experienced in Turkana County. As depicted in Figure 4.8, majority of the respondents (58%) believe that poor sanitation is the main impact that manifests itself due to lack of decent housing in Turkana County. With lack of basic infrastructure like clean water and waste disposal, sanitation condition of the residents is at its lowest with open defecation being the most visible hazard.



**Figure 4.8: Extent to which impacts are attributed to the challenges** (Source: Author, 2018).

Another impact of poor housing that came out strongly is low attainment of education, which attracted response rate of 35%. Constant movement in search of pasture, displacement due to insecurity and lack of permanent residence drives Turkana community away from education. Decent housing encourages permanent settlement and

attracts other communal facilities such as schools, health facilities, energy and other services.

Poor health is another impact attributed to lack of decent housing with response rate of 33%. These statistics are comparable to Nabutola's (2004) argument that lack of embedded fundamental housing infrastructure such as water, sewerage, roads, electricity, social services and security greatly affects the people's health and quality of life in general.

#### **4.6 Strategy for Improving Provision of Housing in Turkana County**

The respondents were asked to give their suggestions on what should be done to increase stock of affordable, low cost and decent housing in Turkana County. The responses received are summarized in Table 4.2. Majority of the respondents (72%) believe that improved security in Turkana County will significantly increase stock low cost, decent and affordable housing. Real estate thrives where there is stability, and this is what is required to spur development of decent housing in Turkana County. Improvement of infrastructure in the county (67%) is another suggestion that featured prominently in the responses. Turkana County is underdeveloped due to many years of neglect and thus massive investment in infrastructure development in terms of roads, waste management, water, energy and communication is required to spur development of decent housing.

**Table 4.2: Summary of responses on what should be done to Increase Stock of affordable, low cost and decent houses**

<b>Challenges</b>	<b>Frequency</b>	<b>Percentage</b>
Improve security	223	72%
Improve infrastructure of the county	209	67%
Diversify economic activities	195	63%
Avail proper housing finance	169	54%
Sensitize the locals on alternative materials and technologies	114	37%
Involve professionals in construction	92	30%
Avail land for housing development	86	28%

**Source: Author, 2018**

The other key intervention required for solving the housing problem in Turkana County was on tackling poverty menace in this County as reflected by 63% of the responses. This is largely through diversification of economic activities for the people of this county who rely entirely on livestock. An economic activity confronted by numerous challenges such as livestock theft, drought and diseases. Among alternative economic activities that can potentially change this narrative of poverty is by making irrigated agriculture work especially after discovery of two large water aquifers in the county.

Significant number of respondents (54%) is also keen on improvement of housing finance suitable for this county. Although majority of respondents of this study believe that the most suitable housing finance for this county is donor funding, they are receptive of a tailor-made financing suitable for this environment with its unique challenges. Other suggestions that came out included the need to sensitize the locals on available alternative building materials and technologies so that they explore options they can afford (37%), involving professionals in housing development (30%) and designating serviced land for the purposes of housing development (28%).

#### **4.7 Housing Policy Agenda Proposed for Turkana County**

From the foregoing, several components came out strongly from the respondents on the challenges, impacts and solutions of affordable low-cost housing in Turkana County. The challenges are unfriendly land tenure, poor infrastructure, low-income levels, lack of government incentives, unfriendly regulatory framework, unavailability of materials and insecurity. However, population explosion, information on ABMTs and lack of proper financing are not critical components in improving quality and quantity of housing in this County. The problem of housing in Turkana requires well thought out solution by all stakeholders through policy interventions. It is the proposal of the author that the first four components land tenure, infrastructure, income levels and government incentives be considered in future when developing housing policy for Turkana County. However, the component of income levels should be considered under other sub sectors such as agriculture, industrialization and affirmative action.

##### **4.7.1 Policy Agenda Setting**

Policy formulation is a structured process that brings together different stakeholders guided by the objective of addressing identified goals, problems or concerns. This stage is important as key issues may gain or fail to get the attention of government policy formulators. The policy must conform to the letter and spirit of the Constitution of Kenya and promote its purposive interpretation. Policy ideas may originate from the Executive and the Executive entities, political formations such as parties, business associations, organized groups or individual citizens. It is always appropriate for the person who originates a policy idea to prepare a policy brief. The brief combines research synthesis and strategy recommendations. It sets down the methods and principles that will be followed in attaining the identified purpose (Kenya Law Reform Commission, 2015). There is good chance that this proposal will be picked leading to formulation of the policy framework.

From the foregoing, I propose three components that will form part of the policy intervention and which I consider will have high impact in the state of affordable housing in Turkana County as follows:

#### **4.7.1.1 Land Tenure**

This component of land tenure system determines who can use what resources for how long, and under what conditions. Most of the land in Turkana County is community lands held in trust for the people by the County Government of Turkana. This implies that the right of all individuals and groups of Turkana against forced eviction is compromised. Since majority of the population do not have titles deeds for the land in which they live in, they cannot access financing from the mainstream lenders, who require titles deed or lease as collateral. This component is very important if it will be incorporated in the policy as it will check nomadism and unlock the potential of Turkana people leading to development of permanent and decent houses.

#### **4.7.1.2 Infrastructure**

Lack of embedded infrastructure such as water, sewerage, roads, electricity, social services and security in Turkana County is big detriment to decent housing considering that they are vital component of housing provision and are fundamental to the success of any housing scheme. If this component is made a policy target, and a follow-up is made to address the problem, then the people's economic capacities, health and quality of life in general will improve.

#### **4.7.1.3 Government Incentives**

Incentives targeted at the housing sector development are very important direct government involvement in enabling residents acquire decent housing. There has been several incentives availed by Government over the years targeted at low income housing in form of tax relives to first homeowners, manufacturers of the key construction

materials and large scale low cost developers. However, agreed tailor-made incentives for Turkana County may be proposed in the policy in order to make the low cost decent housing attractive to developers and residents.

## **4.8 Summary**

The study targeted households in Turkana County and the sample comprised a total of 382 households. The summary of the study findings presented herein followed the research objectives set out in chapter one of the study which were to first, find out challenges facing construction of low cost decent housing in Turkana County. Secondly, assess the impact of the challenges in the provision of low cost decent housing in Turkana County. Lastly, suggest a housing policy agenda that addresses the challenges identified in the provision of low cost decent housing in Turkana County.

### **4.8.1 Challenges Facing Construction of Low Cost Decent Housing in Turkana County**

The study established that the quality of housing in Turkana County is poor. This was manifested by construction materials and technologies in use in the county. The most used construction materials in this Turkana County for roofing is *makuti* and that for walling is poles and mud. However, the findings indicate that majority of the households see the use of these locally available technologies and materials as the solution to the problem of housing.

In terms of housing finance for Turkana County, the study found out that that the residents of this county see donor funding as the most suitable tool of funding housing development. It is worth noting that this county has had long history on dependence on relief and donations for basic needs such as food. On the flipside, mortgage financing despite being the most appropriate way of funding housing development returned the least favorable endorsement from the respondents.

On the challenges facing provision of low cost and decent housing in Turkana County, the study established that low-income levels experienced in the County as the major impediment. The other challenges that came out during the study are poor infrastructure, security, lack of proper financing for housing, high cost of construction materials and lack of government incentives.

#### **4.8.2 The Impact of the Challenges**

The study established that the main impact attributed to the challenges discussed herein is poor sanitation. Poor housing is usually characterized by lack of basic services such as clean water, proper waste management and disposal. It was further established that poor housing has a direct impact on attainment of education. The other impact was poor health as people living in sub-standard housing are subject to much higher incidences of infectious and environmental diseases, such as respiratory disorders, pulmonary tuberculosis, cholera, dysenteries, diarrhoea and other gastrointestinal sicknesses.

#### **4.8.3 Housing Policy Agenda**

The study also established seven components that has significant effect on the challenges of affordable housing in Turkana County. These components in order of prominence are income levels, regulatory framework, unfriendly land tenure, availability of materials, poor infrastructure, security and lack of government incentives. It is the proposal of the author that the first four components land tenure, infrastructure, income levels and government incentives to facilitate the definition of the future proposal's priorities and purposes (Housing Policy Agenda) tailor-made for Turkana County and has the potential of addressing the housing challenges herein discussed. However, the component of income levels should be considered under other sub sectors such as agriculture, industrialization and affirmative action.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusion

The study established that the quality of housing in Turkana County is deplorable. However, there is significant number of respondents who are satisfied with the status quo and view the quality of housing as average. This group of residents does not encourage improvement as they feel they have enough and do not see the need for modern development. On building materials or technologies in use in Turkana County, there is close correlation between this study and the report by KNBS (2010) where the dominant material for roof is *makuti* while for wall is poles and mud. This means that since KNBS carried out their study, there has been no significant improvement in the type of technologies and materials used in putting up shelter in this County.

For a County that has been marginalized for decades, majority of the respondents rightfully believe that their housing development can only be financed through donor funding. This is tandem with continued over dependence by residents of this County on donations from different quarters for their basic needs such as food, water, healthcare and education. Similarly, mortgage financing despite being the most appropriate form of financing housing development, is the least popular form of housing finance in Turkana County.

One construction component that has great impact on the affordability of shelter is the material or technology used. Responses from most of the respondents resonates well with this statement, as they believe using locally available and appropriate technology albeit improving it will tackle the problem of housing in Turkana County. Similarly, the people of Turkana County are rightfully aware that the new constitutional dispensation puts great responsibility to their County Government in the provision of decent housing

for all and thus wants the County Government to take lead role in tackling the housing problem.

Low-income levels of the households in Turkana County are the biggest hindrance to the provision of housing. Based on this, it is difficult to deliver housing since other pressing needs such as food override the need to have decent housing. Similarly, poor infrastructure in the county has greatly affected provision of decent housing. The infrastructure lacking in the County include affordable and reliable energy sources, good all-weather roads, reliable and safe drinking water supply and solid waste management systems. In a unique departure from other documented challenges experienced in the delivery of housing, security that is wanting is single factor that has come out strongly to be detrimental to provision of decent housing. Other challenges are high cost of building materials, lack of proper financing and government incentives in the housing development sector.

According to World Bank (1993), housing as a unit of the environment, has profound influence on the health, efficiency, social behavior, satisfaction and general welfare of the community. This came out clearly in the study where lack of decent housing was found to have profound impact on sanitation, attainment of education and health of the residents.

One avenue of dealing with key issues and challenges of housing in Turkana County is through development of tailor made housing policy. This study found that income levels, regulatory framework, unfriendly land tenure, availability of materials, poor infrastructure, security and lack of government incentives are key elements that must be addressed when the stakeholders come together to develop the housing policy for Turkana County. However, the three priority Government interventions of dealing with land tenure, provision of key housing infrastructure and availing incentives will spur housing development.

## **5.2 Contribution to Knowledge**

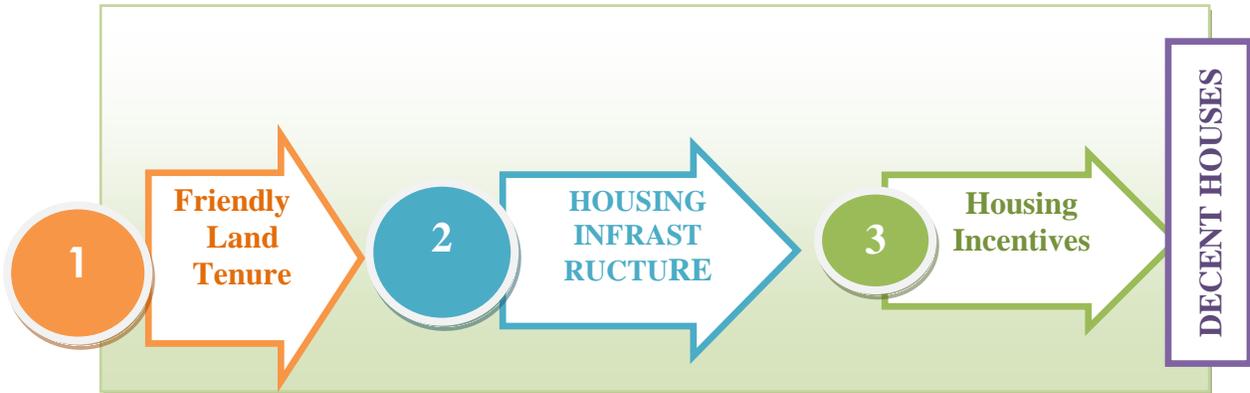
This study identifies distinctive challenges facing development of low cost decent housing in Turkana County. This has never been done before at least for this County faced with unique and numerous challenges. Elements that have significant impact on quality of housing as highlighted in chapter four is notably helpful to both levels of government in tackling housing challenges. If the elements are taken in to consideration and be incorporated in the policy statement developed by the concerned agencies and stakeholders, it would be great step forward in bridging the existing gap of shortage of decent shelter in Turkana County.

## **5.3 Recommendations**

### **5.3.1 Housing Policy Framework Recommendations**

The housing situation in Turkana County as the study found out is dire and requires multi-pronged intervention from all stakeholders. The current National Housing Policy for Kenya of July 2004 has long been rendered obsolete especially after promulgation of the New Constitution, which gave birth to devolved system of government. The policy can no longer deal with the housing issues adequately.

The researcher recommends that the County Government of Turkana cause to be developed, adopted and implemented a housing policy that will help address the unfriendly land tenure in the County, improvement of infrastructure and motivating developers by availing innovative incentives to them as depicted in figure 5.1.



**Figure 5.1: Turkana County Housing Policy Framework (Source: Author, 2018).**

### **5.3.2 Suggestions for Further Research**

From the findings of this study, there are a number of gaps in knowledge that would benefit from further research. These include:

- a. A research to come up with approaches and strategies of providing social housing to marginalized communities through proceeds of oil commercialization.
- b. A research should be undertaken on viability of Public Private Partnership (PPP) or Joint Venture between different parties in the provision of housing for marginalized communities.
- c. Types of current government incentives and their levels of uptake in the real estate in Kenya.

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## APPENDICES

### Appendix 1: Questionnaire

Q. No: \_\_\_\_\_

BIWOTT, JOHN KIPLAGAT

---

P.O. Box 30119-00100

Cell: 0721 760 100

NAIROBI

Email: [jokibi@yahoo.com](mailto:jokibi@yahoo.com)

Dear Sir/madam,

I am final year student of **Jomo Kenyatta University of Agriculture and Technology** undertaking a course in **Msc. Construction Engineering and Management**. I have completed my course work and as part of the programme, it is a requirement that I undertake Research Project. My research study is titled: **A Study of Challenges Facing Construction of Affordable Decent Low-Cost Housing in Turkana.**

It is my humble request that you assist in this study by responding to this questionnaire to the best of your ability. All the information gathered through this study will be confidential and can only be shared with my supervisors.

Yours

**John K. Biwott**

**INSTRUCTIONS**

Respond to each item by a tick (✓) in the boxes provided and/or briefly fill in the space provided

**SECTION A: DEMOGRAPHIC INFORMATION**

1. Please indicate your gender:

Male [ ] Female [ ]

2. What is your age bracket in years?

Below 21 [ ] 21-30 [ ] 31-40 [ ] 41-50 [ ] 51-60 [ ]  
Over 60 [ ]

**SECTION B: CHALLENGES FACING PROVISION OF LOW COST HOUSING IN TURKANA COUNTY.**

1. In your opinion what is the general quality of housing in Turkana County?

Very good [ ] Good [ ] Average [ ] Poor [ ] Very poor [ ]

2. Which type of housing finance do you think is the most appropriate for Turkana County?

Commercial loans [ ] Grants [ ] Donor funding [ ] Self-help groups [ ]  
Cooperative loans [ ] Others (Specify) \_\_\_\_\_

3. How should the problem of housing be tackled in Turkana County?

Private sector participation [ ] County government participation [ ] Use of  
locally available materials [ ] Revision of building regulations [ ] National  
government participation [ ] Others (Specify) \_\_\_\_\_

4. To what extent are the following roof construction technologies/materials used in the construction of houses in Turkana County?

<b>KEY: 5=Always, 4= Often, 3= Sometimes, 2= Rarely, 1= Never</b>					
<b>Roofing technologies/materials</b>	<b>Frequency of use in Turkana County</b>				
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>a. Clay tiles</b>					
<b>b. Concrete tiles</b>					
<b>c. Galvanised iron sheets</b>					
<b>d. Makuti</b>					
<b>e. Grass/straw</b>					
<b>f. Concrete flat roof</b>					
<b>g. Micro-concrete roofing tiles</b>					
<b>h. Stone coated tiles</b>					
<b>i. Others (Specify)</b>					
<hr/>					
<hr/>					

5. To what extent are the following wall construction technologies/materials used in the construction of houses in Turkana County?

<b>KEY: 5=Always, 4= Often, 3= Sometimes, 2= Rarely, 1= Never</b>					
<b>Walling technologies/materials</b>	<b>Extent of use in Turkana County</b>				
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>a. Burnt bricks walling</b>					
<b>b. Quarry stones walling</b>					
<b>c. Interlocking Stabilised Soil Blocks</b>					
<b>d. Sand/concrete blocks</b>					
<b>e. Rammed earth technology</b>					
<b>f. Poles and mud construction</b>					
<b>g. Expandable PolyStyrene Panels</b>					
<b>h. Others (Specify)</b> <hr/> <hr/>					

6. To what extent has the following factors affected provision of low cost housing in Turkana County?

<b>KEY: 5=Extremely, 4= Very, 3= Somewhat, 2= Slightly, 1= Not at all</b>					
<b>Factors affecting provision of low cost housing</b>	<b>Level of influence in Turkana County</b>				
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>a. Income levels</b>					
<b>b. Traditions/Nomadism</b>					
<b>c. Information on Appropriate Building Technology (ABT)</b>					
<b>d. Unfriendly land tenure system</b>					
<b>e. Availability of materials</b>					
<b>f. Poor infrastructure</b>					
<b>g. Security</b>					
<b>h. Lack of financing</b>					
<b>i. Lack of government incentives</b>					
<b>j. Others (Specify)</b>					
<hr/>					
<hr/>					

**SECTION C: IMPACT OF THE CHALLENGES IN THE PROVISION OF LOW COST DECENT HOUSING IN TURKANA COUNTY.**

1. To what extent are the following impacts attributed to the challenges in the provision of low cost housing in Turkana County?

<b>KEY: 5=Extremely, 4= Majorly, 3= Moderately, 2= Slightly, 1= Not at all</b>					
<b>Impacts of lack of decent low cost housing</b>	<b>Level of impact in Turkana County</b>				
	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>a. Poor sanitation</b>					
<b>b. Homelessness</b>					
<b>c. Poor health</b>					
<b>d. Low attainment of education</b>					
<b>e. Others (Specify)</b>					
_____					
_____					

**SECTION D: STRATEGY FOR IMPROVING PROVISION OF AFFORDABLE, LOW COST AND DECENT HOUSES IN TURKANA COUNTY.**

1. In your opinion, what should be done to increase stock of affordable, low cost and decent houses?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**THANK YOU**

**Appendix 2: National Commission of Science, Technology and Innovation  
(NACOSTI) Research Authorization Letter**



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

Telephone: +254-20-2213471,  
2241349, 310571, 2219420  
Fax: +254-20-318245, 318249  
Email: secretary@nacosti.go.ke  
Website: www.nacosti.go.ke  
When replying please quote

9<sup>th</sup> Floor, Utalii House  
Uhuru Highway  
P.O. Box 30623-00100  
NAIROBI-KENYA

Ref: No.

Date:

**16<sup>th</sup> December, 2013**

**NACOSTI/P/13/6711/404**

John Kiplagat Biwott  
Jomo Kenyatta University of  
Agriculture and Technology  
P.O.Box 6200-00200  
NAIROBI.

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on “*Challenges facing construction of affordable decent low cost housing in Turkana County,*” I am pleased to inform you that you have been authorized to undertake research in **Turkana County** for a period ending **31<sup>st</sup> May, 2014**.

You are advised to report to **the County Commissioner and the County Director of Education, Turkana County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

**DR. M. K. RUGUTT, PhD, HSC.  
DEPUTY COMMISSION SECRETARY  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION**

Copy to:

The County Commissioner  
The County Director of Education  
Turkana County.

**Appendix 3: National Commission of Science, Technology and Innovation (NACOSTI) Research Clearance Permit**

**CONDITIONS**

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.



REPUBLIC OF KENYA



National Commission for Science, Technology and Innovation

**RESEARCH CLEARANCE PERMIT**

Serial No. A772

CONDITIONS: see back page

**THIS IS TO CERTIFY THAT:**  
**MR. JOHN KIPLAGAT BIWOTT**  
 of JKUAT, 8724-30100 Eldoret, has been  
**permitted to conduct research in**  
**Turkana County**  
**on the topic: CHALLENGES FACING**  
**CONSTRUCTION OF AFFORDABLE**  
**DECENT LOW COST HOUSING IN**  
**TURKANA COUNTY**  
**for the period ending:**  
**31st May 2014**

**Permit No : NACOSTI/P/13/6711/404**  
**Date Of Issue : 16th December, 2013**  
**Fee Received : Kshs khs1000.00**

*[Signature]*  
**Applicant's Signature**

*[Signature]*  
**Secretary**  
**National Commission for Science, Technology & Innovation**

## Appendix 4: Ministry of Education Research Authorization Letter



REPUBLIC OF KENYA

### MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY

#### STATE DEPARTMENT OF EDUCATION

Telegram: "ELIMU", Lodwar  
Telephone: Lodwar 054 21076  
Fax/No: 054 21076  
Email: cdeturkana@education.go.ke  
Ref: TUR/CDE/CIR/17/VOL.1/12

TURKANA COUNTY EDUCATION OFFICE,  
P.O. BOX 16- 30500,  
LODWAR.

Date: 11/03/2014

**JOHN KIPLAGAT BIWOTT**  
**JOMO KENYATTA UNIVERSITY**  
**AGRICULTURE AND TECHNOLOGY**  
**P.O. BOX 6200 -00200**  
**NAIROBI.**

#### **RE: RESEARCH AUTHORIZATION.**

Following your application dated 16<sup>th</sup> December, 2013, you are hereby authorized to carry out research on "Challenges facing construction of affordable decent low cost housing in Turkana County."

Am pleased to inform you that you are allowed to undertake your research in Turkana County for a period ending 31<sup>st</sup> May, 2014.

You are advised to report to the District Education Officer before embarking on the research project.

  
COUNTY DIRECTOR OF EDUCATION  
TURKANA COUNTY  
P.O. Box 16 LODWAR

**Dr. NICODEMUS O. ANYANG**  
**COUNTY DIRECTOR OF EDUCATION**  
**TURKANA COUNTY**

**Appendix 5: County Commissioner Research Authorization Letter**



**THE PRESIDENCY**

**MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT**

Telegraphic address: COUNTY COMMISSIONER" LODWAR"

Telephone: LODWAR 21240

Telex:

Fax:

When replying please quote

CC.CONF. ED.12/1/VOL.I/(21)

Ref No. ....  
and date

**COUNTY COMMISSIONER'S OFFICE  
TURKANA COUNTY  
P.O. BOX 1 – 30500  
LODWAR**

24<sup>th</sup> January, 2014.  
.....

The Deputy County Commissioner,  
**TURKANA CENTRAL.**



The Deputy County Commissioner,  
**TURKANA WEST.**

The Deputy County Commissioner,  
**TURKANA SOUTH.**

The Deputy County Commissioner,  
**TURKANA EAST.**

**RE: RESEARCH AUTHORIZATION: JOHN KIPLAGAT BIWOTT OF JKUAT**

The above mentioned is authorized to carry out research on "Challenges facing construction of affordable decent low cost housing in Turkana County" within Turkana County for the period ending 3st May, 2014.

Please accord him the necessary cooperation and also ask those under you to do the same.

**J. M: MATHENGE  
COUNTY COMMISSIONER  
TURKANA COUNTY**

**C.C. The County Director of Education,  
TURKANA COUNTY.**

## Appendix 6: JKUAT Research Proposal Approval



### JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

#### **DIRECTOR, BOARD OF POSTGRADUATE STUDIES**

P.O. BOX 62000  
NAIROBI - 00200  
KENYA  
Email: [director@bps.jkuat.ac.ke](mailto:director@bps.jkuat.ac.ke)

TEL: 254-067-52711/52181-4  
FAX: 254-067-52164/52030

REF: JKU/EN352-1256/12

16<sup>TH</sup> January 2014

Mr. Biwott Kiplagat  
C./o SMARTEC  
JKUAT

Dear Mr. Kiplagat,

RE: APPROVAL OF RESEARCH PROPOSAL AND SUPERVISORS

Kindly note that your research proposal entitled: "Challenges facing constructions of affordable decent low cost housing in Turkana County. The following are your approved supervisors:-

1. Dr. Wanyona Githae
2. Eng. C.K Kabubo

Yours sincerely

**PROF. GRACE N. NJOROGE**  
**DIRECTOR, BOARD OF POSTGRADUATE STUDIES**

Copy to:  
/pnk

Director.SMARTEC

*Noted  
Wanyona  
Jan 27, 2014*



JKUAT is ISO 9001:2008 Certified  
Setting Trends in Higher Education, Research and Innovation

## Appendix 7: JKUAT Introduction Letter

JKU/2/84



**JOMO KENYATTA UNIVERSITY  
OF  
AGRICULTURE AND TECHNOLOGY**  
Sustainable Materials Research & Technology Centre  
**SMARTEC**

P.O BOX 62000-00200, NAIROBI-KENYA. • Tel: (067)52181/2/3/4 • Fax:(067)52164 •E-mail: kabcha@jkuat.ac.ke

REF: JKU/2/84/ 175

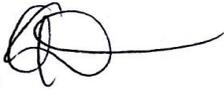
DATE: 29<sup>th</sup> October, 2013

### TO WHOM IT MAY CONCERN

BIWOTT JOHN KIPLAGAT-REG NO EN352-1256/2012

This is to confirm that the above is a student in this University and has successfully completed his first year of study and is now at the thesis stage. Should you require any information concerning him, do not hesitate to contact us.

Yours Faithfully

  
Eng C.K.Kabubo

Director, SMARTEC



JKUAT is ISO 9001:2008 certified

