

**UNIVERSITY OF NAIROBI**

**DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK**

**AN ASSESSMENT OF CARGO CONTAINERS USED TO PROVIDE AFFORDABLE  
HOUSING IN KENYA: A CASE OF EMBAKASI WEST CONSTITUENCY, NAIROBI  
COUNTY**

**BY**

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**NOVEMBER, 2019**

**DECLARATION**

This research project is my original work and has not been presented for any academic award in any other institution.

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This project has been submitted for examination with my approval as the University Supervisor.

Signature\_\_\_\_\_

Date\_\_\_\_\_

Prof Robinson Mose Ocharo  
Supervisor

## **DEDICATION**

To Papa and Mama

For your encouragement, support, and all resources granted me,

God through you, has brought me this far,

Thanks mum, thanks dad;

May God richly bless you.

## **ACKNOWLEDGEMENT**

It has been quite an effort to compile this project. Several people have contributed to making this a success and I would like to extend my sincere gratitude to them.

I am highly indebted to my supervisor Prof Robinson Mose Ocharo for his insightful criticisms, academic advice and constant supervision towards the successful completion of this project.

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I finally wish to appreciate every other person including my colleagues for willingly helping out within their abilities.

## ABSTRACT

The main aim of this study was to assess the implications of using container houses to provide affordable housing in Embakasi West Constituency, Nairobi County. The study's specific objectives were to examine the people's perceptions on cargo container houses on affordable housing (in Embakasi west constituency, Nairobi County), to examine the affordability of container houses (by the residents of Embakasi West Constituency) and to identify challenges of cargo container housing in Embakasi west constituency, Nairobi County. The study adopted a descriptive research design. This study targeted cargo containers house owners in Embakasi West Constituency which consists of 4 wards namely Umoja I, Umoja II, Mowlem and Kariobangi South. Questionnaires were used to collect data and analyzed by means of descriptive statistics for quantitative data and qualitatively using content analysis. A majority of Embakasi West Constituency (50.2%) agreed that there is a housing problem in Kenya which needs an urgent address. About 46.5% of the respondents were of the opinion that those who have low income to live in this houses since they can afford them at lower cost. The study concluded that people living in Embakasi Constituency have a perception that cargo container housing can be used as a home, renting purposes, storage and for transport and consider mostly the value of the container in regard to their needs. The affordability of cargo container housing is positively correlated to the income of the household head. This emanates from the fact the respondents strongly agreed that affordability on cargo housing containers affects affordability of housing to a greater extent and availability of capital influences the affordability of cargo container housing. Cargo container housing is faced with many challenges such as customizing the design to suit owner needs is very expensive, moving the container from one point to another is also expensive and it is subject to weather changes. The challenges of affordability of housing in Embakasi Constituency are as a result of very earning very little and high cost of housing. The study recommends that the financial institutions should take steps to finance people who choose for cargo container housing. The government should encourage alternative building technologies that are cheaper to its people and can be established in urban areas which are densely populated.

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## CHAPTER ONE: INTRODUCTION

### 1.1 Background to the Study

Housing is a standout amongst the most critical life segments giving haven, wellbeing and warmth, and in addition giving a place to rest. Objective eleven of the Sustainable Development Goals is tied in with making urban communities comprehensive, sheltered, versatile, and maintainable. As indicated by UN Habitat (2015), the key focus of Goal Eleven was to guarantee that all individuals approach sufficient, sheltered and reasonable lodging. Lodging has a basic job in financial advancement of every nation, representing 10–20 % of aggregate monetary movement in the nation, and additionally being to be the greatest settled resource of family units (European Commission, 2005).

Housing is not the only human need, human needs are very diverse but still people thrive only on the expectation of better and improved housing. However in modern times, people tend to look at viability, temperate and new upcoming designs as per the trends and in line with nature as one of the housing requirements (Henilane, 2015a). Woetzel, Williams and Hague (2016) see that not too bad, moderate lodging is crucial to the wellbeing and prosperity of individuals and to the smooth working of economies. However around the globe, in creating and propelled economies alike, urban areas are attempting to address that issue.

The Universal announcement of Human Rights (1948) looks at the privilege to adequate lodging as a crucial aspect of the privilege to better ways of life. Wadrip (2011) states that in the worldwide field protect is perceived as one of the fundamental needs. The desire is that lesser consumption in lodging by families concurs them more beneficial eating regimens, quality training to their kids and the capacity to address different issues of life. Wood (2004) states that while lodging is a sturdy decent, the capacity of family units to get to it in a sufficient and fair

condition without trading off different necessities has been found to have a great deal of financial advantages which collect to the residents, business network and the administration.

The world is experiencing a crisis on the deficiency of affordable housing. This could imply that the worldwide reasonable lodging hole would influence one of every three urban occupants, about 1.6 billion individuals (Woetzel et al., 2016). As indicated by Florida (2017) almost 900 million individuals around the globe live in ghettos, lacking access to satisfactory water and sanitation or sufficient lodging. The UN-Habitat (2005) gauges that throughout the following 25 years, more than 2 billion individuals will add to the developing interest for lodging, water supply, sanitation and other urban foundation administrations.

Africa faces a noteworthy housing emergency because of quick urbanization and a developing ghetto populace (World Bank, 2015). Development Review (2015) gauges that by 2050 Africa's populace will have multiplied achieving 2.4 billion which will extend the urban communities to past limit because of deficient lodging and related foundation needs, for example, streets and clean water. In Nigeria, Africa's most crowded nation, just 100,000 new houses being fabricated every year contrasted with a yearly interest of 700,000 and an amassed shortfall of around 17 million houses.

In South Africa the administration has made advances into addressing lodging needs by working more than 3 million lodging units on a financed premise since 1994 anyway request is still on the higher end and current assessments of the shortfall remains at around 2 million houses (UN-Habitat, 2017). To the extent populace thickness is concerned, Kenya is the 47th biggest nation. It is generally meagerly populated, notwithstanding, and for each square kilometer of land, there is a normal of 79.2 individuals (205 for every square mile) and this implies Kenya is the 140th

most thickly populated nation on earth (World Population Review, 2017) In Kenya, Chapter 4 of the constitution, the Bill of Rights in Article 43, states that each individual has the privilege to open and sufficient lodging, and to sensible measures of sanitation. However as Nahinga (2007) notes, Kenya is facing a serious shortage of houses and people earning below one hundred and twenty thousand Kenya shillings per month cannot afford the current mortgage rates.

The Ministry of Lands (2004) notes that the lodging shortage gets from the low dimension of interest in the area by both open offices and the formal private segment, with lodging units created by the two areas speaking to just an expected 20 percent of the aggregate number of new urban families. Different components that add to the national lodging deficiency incorporate the fast urbanization, unavailability to land and lodging fund, stringent arranging directions, prohibitive building measures, mind-boggling expense of foundation, poor monetary execution and expanded destitution.

The intense lodging deficiency in the nation is frequently faulted for the way that engineers have focused on working for the top of the line showcase, to the detriment of low-pay workers. In addition, the expense of property in Kenya is among the most elevated, in the landmass as well as in a few nations in the West, (Superior Homes Kenya, 2017) According to Habitat for Humanity Kenya (2016), the lodging deficiency in Kenya is still at 2 million of every 2012 and keeps on constructing more than 200,000 housing units each year. There is an expansion of temporary shelters in urban territories with 60 percent of the populace living in casual settlements. Families live in stuffed homes ordinarily with one room and no satisfactory ventilation.

With suburbia included, Nairobi is Africa's fourteenth biggest city with 6.54 million individuals, (World Population Review, 2017). Nairobi is also home to a number of slums and informal settlements such as Kibera which is the largest slum in East and Central Africa, Korogocho, Mathare, Babadogo, Nyalendo, Majengo and Mukuru kwa Njenga. The Borgen project (2013) states that the largest urban slum in Africa is Kibera which is reported to be housing around two hundred thousand to one million people, a clear indication that Kenya is experiencing a looming crisis in developing affordable homes.

Habitat for Humanity Kenya (2016) also notes that the defenseless, specifically ladies, kids, people living with incapacities, the elderly and vagrants, are most exceedingly bad hit. Under the new reverted arrangement of government, lodging conveyance is the obligation of the region governments. There is a hazard that absence of viable coordination and absence of specialized fitness at nearby dimension can smother the arrangement of lodging. Notwithstanding constrained access to arrive (68 percent of Kenyans are without land documentation or residency security) and inadequate pay, absence of moderate lodging fund is another restricting element for low-pay families to enhance their lodging conditions.

It is within this background that this study seeks to examine whether container homes could be used as an alternative solution to Kenya's housing problems.

## **1.2 Problem Statement**

Shelter is one of man's basic needs in that even those who cannot afford it still need it. The struggle to own a decent home has progressively increased owing to the advancing dynamics in human race. Housing itself is capital intensive in nature requiring an individual to save, beg or borrow. The world's population is over 7.3 billion people with a 1.09 percent growth annually.

Population growth rate therefore creates a housing necessity and puts pressure on existing housing situations.

In Kenya population growth rate of 2.9 percent p.a is higher than that of the GDP at 1.1percent annually. This then implies that life itself has become expensive and affordability of anything is a challenge, let alone housing. According to the World Bank, Kenya needs to build an average of 244,000 homes annually so as to meet the demand of the growing population. However less than a quarter of these homes are built annually, leaving the house deficit growing every year. The governor, Central Bank, estimates the housing deficit in Kenya to be 240,000 units per year. It also notes that majority of the affected population constitutes low income earners. This has been brought about by rapid urbanization as a result of devolution and realization of Kenya's Vision 2030.

Kenya faces a major housing crisis particularly Nairobi city. UN-HABITAT (2010) report show that a huge number of individuals are living in the rambling ghettos and furthermore in other casual shelters around Nairobi. Casual shelters and ghettos in Nairobi have kept on developing at a disturbing rate in number and in addition in populace. Interest for lodging far outperforms its supply in Kenya, particularly in urban zones that have for since a long time ago experienced lack of common sense, bringing about an expansion in casual settlements with poor lodging and little framework administrations (UN-HABITAT, 2010). Regardless of a few endeavors at accomplishing tolerable lodging for Kenyans, Kenya has, all in all, neglected to address the desperate lodging states of her populace. The circumstance has been in part lightened through the exercises of the private segment lodging engineers, who have been a key provider of lodging, especially in Nairobi (Hassanali, 2009).

Frequently one sees freight compartments that have been changed into police posts, facilities, shops and brief workplaces yet their utilization for lodging is just barely starting. Freight compartments simply like other elective building innovations have been seen by a few people as a shabby and simple method for giving pre-fab lodging instead of a permanent solution to housing. According to The Guardian (2015), many people still hold the possibility that a steel box is definitely not a decent place to live in and that physical keep going forever. We in this manner still come up short on the mind move to be liberal and grasp elective building arrangements. In addition the building code considers such structures as temporary and therefore not eligible for financing.

The adoption of shipping container homes is slowly increasing as home seekers look for more affordable accommodation. Even though container office blocks and small retail shops, popularly known as kiosks, have been used for some time locally, container homes have not really caught on in Kenya, unlike in other parts of the world. Housing is still a challenge despite various efforts by the Government and Non-governmental organizations directed at solving the crisis. Cargo container homes can only be a distinct advantage if the center and high salary workers will downsize and receive such for housing. The focus of this study was therefore to examine whether container houses could be an alternative solution to the housing challenge in Nairobi.

### **1.3 Research Objectives**

#### **1.3.1 General Objective**

The main aim of this study was to investigate the implications of using container houses to provide affordable housing in Embakasi west constituency, Nairobi County.

### **1.3.2 Research Questions**

- i. How do people perceive cargo container houses on affordable housing in Embakasi West constituency, Nairobi County?
- ii. Do the residents of Embakasi West Constituency find cargo container houses affordable?
- iii. What are the challenges of cargo container housing in Embakasi West constituency, Nairobi County?

### **1.3.3 Specific Objectives**

- i. To examine the people's perceptions on cargo container houses on affordable housing in Embakasi West constituency, Nairobi County.
- ii. To examine the affordability of cargo container houses by the residents of Embakasi West Constituency
- iii. To identify challenges of cargo container housing in Embakasi West constituency, Nairobi County

### **1.4 Significance of the Study**

This study sought to investigate the implications of using container houses to provide affordable housing to the residents of Nairobi County. The study therefore intended to provide insights on alternative forms of housing that are quite affordable. The findings of the study would be useful to the stakeholders such as policy makers, academicians, media, building industry professionals, Ministry of Lands, the government, manufacturers, suppliers, contractors and the general public as it would provide useful information about container homes which could be incorporated in Kenya's development agenda towards realization of Vision 2030 and Sustainable Development Goals.



Different policies and strategies have been formulated over the years in Kenya to improve housing delivery system, most of which have been slow and ineffective. This study would be of relevance to the Housing Policy Formulation process as it would provide relevant background information on the viability of adopting container houses as a strategy of effective housing delivery and therefore formulate housing policies that would enhance the uptake of container houses as a strategy towards creating affordable houses for the residents.

This study would also be useful to potential homeowners as they would gain insights on the facts related to container houses from which they can base their decisions in terms of going for container houses or the normal brick and mortar. The study findings would also be useful to researchers and professionals as they would have a vast knowledge of the potentiality of container houses as an alternative to the housing challenges being experienced.

### **1.5 Scope and Limitations of the Study**

The need for an effective housing strategy is felt countrywide. Kenya faces an acute shortage of houses and this is attributed to the rural-urban migration, concentration of economic activities, high land costs and lack of policies and regulations that govern housing provision. All these challenges have translated into increased rental charges as the available houses are not enough to accommodate the growing population. Houses have thus become expensive and people have resorted to makeshift structures in areas believed to be quite affordable leading to the mushrooming of slums.

This study however focused on Nairobi County, Kenya's largest city in terms of population and developmental activities, specifically Embakasi West constituency area which is home to many low and middle income earners. Embakasi West constituency has witnessed the mushrooming of

houses thus a suitable location to establish whether cargo container houses could be used as an alternative. This study sought to establish whether container houses could be used to solve the current housing crisis. The study was limited to cargo container houses. It therefore sought to examine the related advantages and disadvantages associated with cargo container houses in comparison with the normal concrete homes. The study also sought to uncover the myths and misconceptions people hold in relation to container houses and to examine how these factors influence their choice of an ideal home.

### **1.6 Definition of Key Terms**

**Cargo Container:** An equipment with strength enough used for transport, handling and storage of goods.

**Affordable Housing:** Refer to housing which is perceived to be manageable in terms of finances to those with a moderate household income or below as per the standards set by the national government or a local government and by a housing governing body.

**Perception:** Refer to a belief or opinion, often held by majority of people on the use of cargo container housing as an affordable house.

**Affordability:** Refer to the state of cargo container housing of being cheap enough for people to be able to buy and use for housing purposes.

## **CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

### **2.1 Introduction**

This chapter covers a review of literature on overview of cargo containers, perception on cargo container housing, role of cargo container housing, challenges in cargo container housing, theoretical framework and conceptual framework.

### **2.2 Overview of Cargo Containers**

Shipping containers were once just a recognizable site down at the docks or as make-move stockpiling compartments on structures locales. Today however, on account of their reasonableness and quality, they are turning into an inexorably prominent apparatus for building a home out of (Nelson, 2016). The military helped Malcolm McLean's development turned into an imperative transport device; amid the Vietnam War, compartments were utilized to deliver supplies to troops and bases abroad. This is the point at which the compartment strategy for delivery flourished and turn into the standard. The military likewise put transportation holders on the guide regarding lodging: they were regularly utilized as crisis covers since they could be effectively and immediately strengthened for assurance and security. Transportation compartments have been incorporated into development of business and private structures in Europe and Asia for a considerable length of time. In swarmed Amsterdam, for example, these once-stranded, and plentiful, holders have given genuinely necessary low-salary and understudy lodging. They say that need is the mother of development, and we don't oppose this idea. From crisis covers for fighters to lodging for thickly populated urban communities, holder engineering has helped fill a squeezing requirement for reasonable, supportable structures (Boxman Studios, 2013).

The present-day industry is genuinely worldwide and contacts full scale lives in manners we can't envision. The Economist (2013) proclaimed that the holder has been to a greater extent a driver of globalization than all exchange understandings in the previous 50 years together. Levinson (1956) recommends that the compartment and holder shipping are to a great extent in charge of the development of worldwide exchange. Transportation compartment abodes have been considered as ahead of schedule as the mid-1960s and created because of a design enthusiasm for blending portability and assembling 8 into building development. In 1966, the American planner Paul Rudolph thought about the utilization of compartments as segments in the structure of towers in Manhattan. The utilization of compartments in immature nations had for quite some time been considered by designers and actualized as a financially savvy implies for sanctuary (Scoates, 2003). Notwithstanding, in the United States and other created nations, holder lodging keeps on being a fairly extreme idea that is held fundamentally for innovators (Strauss, 2010).

Shipping containers are the most brilliantly assorted secluded building hinders that advanced life brings to the table and the potential, especially in remote parts of Africa, where building is a strategic test, is huge. There is a huge market for the shipping container industry in Africa. The market demand for container homes started in the early 1970s and that's when people decided they could add value to containers by transforming them to offices, clinics and apartments (Kilian, 2016).

### **2.3 Perception on Cargo Container Housing**

Minenhle and Alexandra (2016) carried out a study on suggestions for utilizing shipping holders to give reasonable lodging. 61 Countesses compartment private working in Windsor East, Johannesburg were chosen for this contextual analysis to uncover inhabitants' supposition. This examination report gives the inhabitants' impression of transportation holder lodging

improvements, in light of their experience, with the motivation behind, first, understanding the perspectives held towards delivery compartments as building units. The outcomes demonstrates that transportation holders have been utilized and gotten in Windsor East and that delivery compartments are more acknowledged in rental lodging typologies.

Dave, Watson and Prasad (2017) study investigated on the execution and discernment in prefab lodging: An exploratory industry overview on maintainability and reasonableness. A quantitative methodological methodology was picked which included writing audit and a pilot overview prompting an online exploratory worldwide industry review. The outcomes undeniably mirrored a recognition that as the homes enhanced manageability their execution dropped on reasonableness and the other way around. In any case, the outcomes likewise shown that to some degree when the homes enhanced moderateness and their manageability enhanced as well.

Balogun (2018) study examined on shipping container as an elective lodging arrangement: Case Study Lagos, Nigeria. The examination was directed via completing an online review utilizing Google frames. The outcomes demonstrate that dominant part of the respondent live in leased condos, are profoundly instructed and will acknowledge shipping holder lodging. While a portion of the respondent think about that transportation compartment isn't proper for human home, which is because of their viewpoint of delivery holder homes as far as ease.

Islam, Zhang, Setunge and Bhuiyan (2016) study investigated on life cycle evaluation of transportation holder home: A maintainable development and found that the manageability of another item like 'upcycled' delivering compartment in building industry essentially relies upon natural advantage of the materials and techniques utilized. The possibility of utilizing shipping holder in building was surveyed as far as its constructability and life cycle ecological effects. The

outcomes demonstrate that the combined vitality request, an unnatural weather change potential, fermentation potential and eutrophication potential were the most overwhelming effect pointers for the activity stage, while water utilize was for the development stage, and strong waste was for the transfer stage.

In Kenya Superior Homes Kenya (2017) point out that the Building regulation has adhered to the customary physical technique for development, in spite of options, for example, precast solid boards, holder and timber houses. Other than being outdated, physical innovation is costly and takes a considerable measure of time. Nonetheless, Kenyans' demeanor towards new building advancements will likewise need to change since we are so used to block and cement with the end goal that if a house is fabricated utilizing some other material, we think it is of second rate quality.

Brow (2011) carried out an evaluation of mass produced interim housing in post natural disaster areas. Through a preference weighting process called Analytic Hierarchy Process (AHP), each design attribute was given a score by means of the five-level Likert scale. The results from the analysis matrix ranked the most appropriate model to be deployed following a natural disaster to meet the demand for interim-to-long term housing to be the Katrina Cottage. The cottage presents the most advantageous characteristics that are warranted in comparison to the other suggested models in the study. This study provides the framework for future disaster reconstruction efforts and enables local, state, and federal governments to quantify the unique design criteria of future housing solutions into a comparable analysis matrix.

#### **2.4 Role of Cargo Container Housing**

Botes (2013) study investigated on attainability investigation of using shipping compartments to address the lodging accumulation in South Africa. Two experiments for the attainability examine

were structured. The primary case considers a measured single-story private home and the second experiment considers a multi-story, medium-thickness private building, fit for lodging various families. The discoveries of the investigation demonstrate that a solitary story arrangement using compartments demonstrates inadequate, as it is more costly per square meter than a traditional home. In any case, a multi-story holder arrangement is plausible, as it is bring down in expense (than similar customary arrangements), quicker to build, considers higher thickness development of settlements and is all the more ecologically cordial.

Radwan (2015) study focused on containers architecture reusing shipping holders in making innovative engineering spaces. This sort of Architecture plans to make some compositional spaces that has diverse capacities and human exercises, not just on the size of an individual building yet additionally on a bigger scale that can help in making a snappy or now and then impermanent answer for a building or a gathering of structures that are basically steady and safe, condition agreeable, with high abilities of accomplishing tasteful qualities that can be used by individuals.

Zaki and Danraka (2015) study examined on potentials of shipping container buildings and the implication to Nigeria housing challenges. A critical review of literatures was carried out and it revealed that the ISO containers have its benefits and shortcomings, and conclusions were drawn which indicates that the advantages of utilizing this ISO shipping containers unit outweigh any disadvantages especially with present Nigerian housing scene which we will discovered later in the paper. Recommendations were proffered on how the shipping container building can be projected positively in tackling Nigeria housing needs.

## **2.5 Affordability of Cargo Container Housing**

According to a feasibility study on the affordability of using shipping containers for housing development purposes carried out by Dave (2014), there is a new construction trend which has been accepted universally where shipping containers have been fabricated into commercial spaces, offices, ablution blocks, family homes and institutional structures. Some of the benefits associated with the shipping containers entail architectural efficiency, saving time, low risks like fire and other environmental advantages.

Bhatia (2018) study on design of a cost-effective, modular, and energy-efficient home sought to address the growing problem of a lack of affordable, energy efficient, and environmentally-sustainable housing in partnership with Harvest Energy Solutions in Jackson, Michigan. This is achieved through the design of a prototype of modular single-family home that is affordable and energy-efficient. The methods used in the study were firstly architectural design of a single module of a home, simulation of energy performance for a baseline vs. traditional model, and finally constructing a cost model. It seeks to create awareness among architects, engineers and developers about the growing need for sustainability and the energy savings that can be achieved alongside affordability.

Zaki and Danraka (2015) study examined on potentials of shipping container buildings and the implication to Nigeria housing challenges. A critical review of literatures was carried out and it revealed that the ISO containers have its benefits and shortcomings, and conclusions were drawn which indicates that the advantages of utilizing this ISO shipping containers unit outweigh any disadvantages especially with present Nigerian housing scene which we will discovered later in



the paper. Recommendations were proffered on how the shipping container building can be projected positively in tackling Nigeria housing needs.

## **2.6 Challenges in Cargo Container Housing**

Olugbenga and Adekemi (2013) study examined on challenges of housing delivery in metropolitan Lagos. The study established that land play a major role in ensuring effective housing delivery. Urbanization in Nigeria has brought about restricted availability to land and in this way aggravate the issues of lodging arrangement that urban and territorial arranging is meaning to tackle. The continuity and dynamism of land value make its classification as a process inappropriate. Land value thus arises when comparatively increasing number of people jostles for land in urban centers as against the rural areas. Therefore, the government necessities to advance approaches that will improve decrease in the expense of building material and place much accentuation on openness to arrive. This could be accomplished by advancing laws that will upgrade simple openness to arrive for mass lodging creation.

Enitan and Anthony (2017) study investigated on working with transportation compartments: a feasible way to deal with unraveling lodging lack in Lagos Metropolis. Most transporting holder design changes have anyway been for brief convenience needs, for instance, stockpiling, make-move shops, crisis safe houses and site workplaces. Notwithstanding, this idea of utilizing shipping holders as measured building parts in engineering and green prefab home building structures is as yet unfamiliar to building experts and inhabitants of Lagos state.

Chepsiror (2013) study investigated the difficulties of lodging improvement for the low salary populace in Kenya; A Case of Eldoret Town. It was set up that the difficulties experienced by lodging engineers in wandering into low salary showcases in Eldoret incorporate low rate of profitability, increasing expense of land, complex land securing process, high enthusiasm on

capital back, shortage of land with foundation and obsolete arranging directions. It was additionally discovered that among the methodologies distinguished to oversee difficulties on getting to minimal effort lodging in Eldoret town included arrangement of ease building materials, utilization of suitable building advancements, low loan costs on building money, sourcing assets from global networks, end of social hindrances on property proprietorship and the board and change of the current construction regulation.

Kakumu (2016) study examined the challenges contributing to unaffordable housing in Kenya. The study population consisted of a total of 50 apartments which included gated communities and apartments. The results established that factor affecting affordability of housing in regarding geographical region of properties was that rental houses are more near learning institutions and work places as opposed to guarded estate communities, residential developments being constructed currently are far from the Central Business District (CBD), and lack of available land near the CBD has led to real estate developers developing in remote areas.

## **2.7 Theoretical Framework**

### **2.7.1 Housing Adjustment Theory**

This study drew from the Housing Adjustment Theory that was advanced by Morris and Winter in 1975 (Morris and Winter 1996). The housing adjustment theory is a system for understanding the procedure by which family units look to look after balance, the reasons for disequilibrium, and the results of existing in a condition of disequilibrium. In this case, balance alludes to a state in which the family unit's current lodging is as per the standards of both society and the family unit itself, and it fits the requirements of the family unit. Lodging standards incorporate space, residency and structure type, quality, use and neighborhood. When at least one of these standards isn't met by the family's current lodging, the family encounters a lodging shortfall.

The theory focuses on households felt needs and their desire to assess their present housing situation. According to the theory the household assesses its current housing condition versus the standards set by the society and if in any way it finds that to be below standard then it seeks to change its situation. For example, a run of the mill space standard is the desire that the residence will have enough rooms so that contrary sex youngsters won't need to share a room once they achieve a particular age. Be that as it may, if a residence does not have enough spaces for this standard to be maintained, the family unit will encounter a deficiency. Shortages prompt sentiments of disappointment with one's current lodging, and endless disappointment may make the family unit participate in change conduct as alteration, adjustment, or recovery. Then again, a shortage in one territory, for example, the room model might be counterbalanced by a positive shortfall in another zone, for instance an extremely huge patio. Along these lines, the family unit should figure out which shortage is more dissatisfactory to them and roll out their improvements dependent on that choice

The correlation between the idea which a household tends to hold as their desired housing situation versus what they are actually occupying at the moment may lead to them expressing satisfaction or dissatisfaction. Should they feel dissatisfied, they may opt to do either one of the following:

- i) either redefine its needs or change its evaluation of subjective measures,
- ii) Failing (i) above, either change the household characteristic or those of the dwelling.

The Housing Adjustment Theory has some weaknesses though. The theory attempts to explain the way households balance satisfactory situations with unsatisfactory ones within their dwellings. The exercise in careful control takes different assessment factors: existing condition,

singular reactions, saw shortages, and assumed lodging standards. The numerous factors and conditions prompts a circumstance where a similar arrangement of information could be drawn closer from an alternate edge with each examination and the outcomes would fluctuate each time.

The other weakness of the Housing Adjustment Theory is that it does not exhaustively explain why individuals change or, why they don't acclimate to social standards. While social standards are an incredible main thrust in lodging structure, numerous individuals (for an assortment of reasons) decided not to pursue the predominant patterns. A few people have distinctive stylish tastes...while others either come up short on the methods or capacity to roll out improvements. Therefore, from this point of view, HAT is to some degree restricted in light of the fact that it does not have the capacity to clarify (or foresee) how people will change their individual lodging decisions or inclinations.

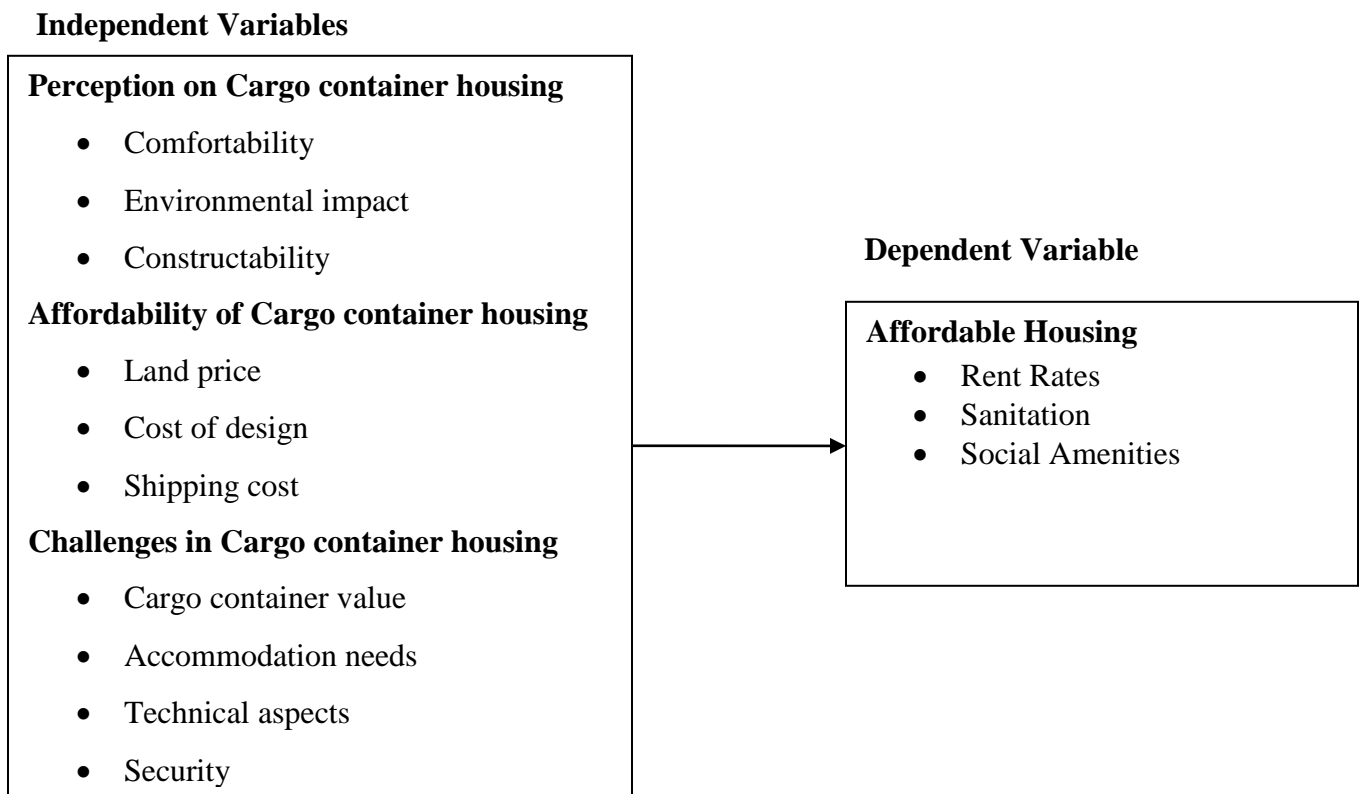
### **2.7.2 Investment Theory**

The assumption of the Investment theory is that the home construction industry is made up of competing firms which are all faced with increasing cost for the building materials and labor (DiPasquale, 1999). This theory treats residential construction like other types of investments and does not take into consideration the most important factor of housing supply which is land. The works of Poterba (1984) and Topel and Rosen (1988) clearly illustrate the frameworks of the Investment theory. Poterba (1984) employs two approaches, the asset market approach and model housing markets to illustrate that housing supply is the key aspect in terms of investing in structures as opposed to land. Topel and Rosen (1988) on the other hand place value to decisions made about housing production. This is after comparing the asset prices versus the marginal cost

of production being used at the time. The argument is that asset prices is the main determining factor for housing investment of both short and long run investment supply. The theory was relevant to the study because it offers a better understanding of what happens in urban settings. In urban areas, unlike rural areas, there is less available land due to high population density.

## 2.8 Conceptual Framework

**Figure 2.1: Conceptual Framework**



**Source: Researcher (2018)**

Figure 2.1 shows the relationship between variables. The independent variables include accommodation needs, rent rates, land rates and container value. The intervening variables

include affordability, constructability, comfortability and social amenities and the dependent variable include cargo container houses. Cargo container houses are quite cheap as it is extremely easy to execute a shipping container home design. They can be built with incredible speed and are also environmentally friendly.

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.1 Introduction

This chapter entails the research design, target population, sampling design and sample size, data collection instruments, pilot study, data collection procedure, data analysis and ethical considerations.

### 3.2 Research Design

The study adopted a descriptive research design. Kothari (2004) recommend that the use of descriptive research design empowers the researcher to make a specific expectation by describing information and qualities of the objective populace. Using distinct research the scientist might gather information from a bigger populace economically and quicker with the utilization of surveys and get decisive discoveries.

### 3.3 Target Population

Target population as defined by Orodho (2005) is a large population from whom a sample population is drawn. This study targeted cargo containers housing in Embakasi West Constituency which consist of 4 wards namely Umoja I, Umoja II, Mowlem and Kariobangi South. The respondents were owners of cargo container house.

**Table 3.1: Target Population**

<b>Ward</b>	<b>Target Population</b>
Umoja I	158
Umoja II	110
Mowlem	115
Kariobangi	185
<b>Total</b>	<b>568</b>

### 3.4 Sampling Design and Sample Size

The study used a stratified sampling technique to ensure that all members of the population were well represented. Simple random sampling method was used to select the respondents. The distribution of sample size is shown in Table 3.1.

The study used a sample size formula by Taro Yamane (1967) assuming an error term of 5%.

$$n = \frac{N}{1+N(e)^2}$$
$$n = \frac{568}{((1+568*(0.05)^2))}$$
$$n = 235$$

The sample size drawn was 235 respondents representing 41.4% of the target population. The proportionate distribution of sample size was obtained using a 0.414. This is shown in Table 3.2.

**Table 3.2: Sample Size**

Ward	Target Population	Sampling Factor	Sample Size
Umoja I	158	0.414	65
Umoja II	110	0.414	46
Mowlem	115	0.414	48
Kariobangi	185	0.414	76
<b>Total</b>	<b>568</b>	<b>0.414</b>	<b>235</b>

### 3.5 Data Collection Instrument

Questionnaires were used as data collection instruments. Both close ended and open ended questions were used to obtain information based on specific objectives. The closed ended questions were in likert scale.



### **3.6 Pilot Study**

A pilot study was conducted to 10 respondents who were not allowed to take part in the final study to test the validity and reliability of the questionnaires.

#### **3.6.1 Validity of the Instrument**

Validity was ensured through content validity by using a clear and simple language in the questions that the respondents could understand. The researcher also contacted the supervisor as the researcher expert to ensure that the questionnaires are valid and can measure what the study intended to achieve.

#### **3.6.2 Reliability of the Instrument**

Cronbach alpha coefficient was used to ensure reliability of the instrument by obtaining a correlation coefficient. Data from the pilot study was analyzed and showed a correlation coefficient of 0.714 which illustrated that the instruments were reliable as Mugenda and Mugenda (2003) recommends.

### **3.7 Data Collection Procedure**

The owners of the cargo container houses and the government authorities were contacted to seek permission to carry out the study. Research assistants were employed to distribute questionnaires to the respondents and to explain the purpose of the study to them. This was necessitated by the fact that the population to be studied was diverse and dispersed.

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

Descriptive analysis was used to analyze quantitative data and this was aided by the use of Statistical Package for Social Sciences (SPSS) version 20.0 and content analysis technique was analyzed thematically. Open ended questions were analyzed using content analysis and presented in narrative form.

## CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

### 4.1 Introduction

This chapter basically presents the data analysis, presentation and its interpretation based on the descriptive statistics.

### 4.2 Response Rate

A total of 235 questionnaires were administered to the cargo container home owners which were filled and returned. It was based on this that the response rate was drawn. This is presented in Table 4.1.

**Table 4.1: Response Rate**

Category	Frequency	Percentage
Responded	223	94.9
Non- responded	12	5.1
<b>Total</b>	<b>235</b>	<b>100</b>

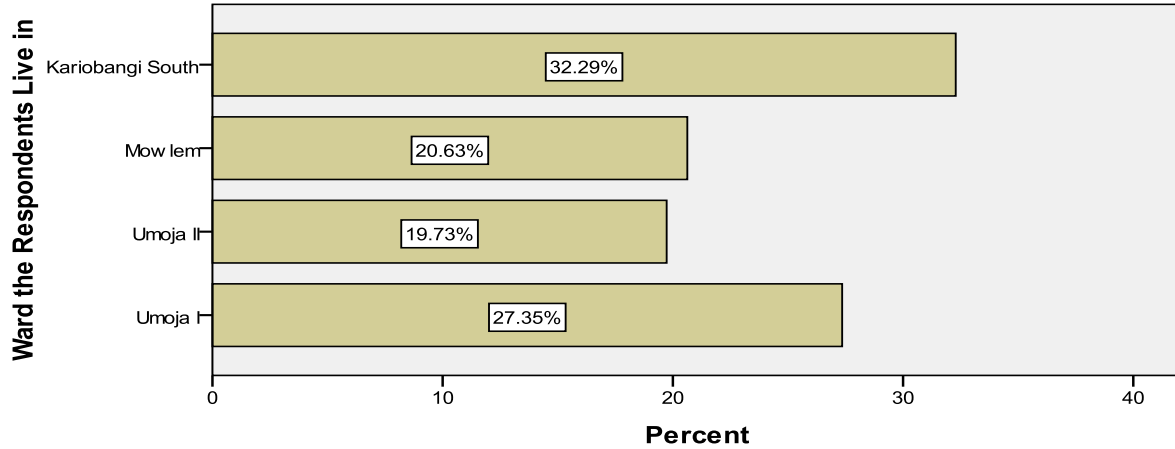
#### **Source: Research Data (2018)**

Table 4.1 indicates that 94.9% of the respondents responded to the questionnaires while 5.1% of the respondents did not. Mugenda and Mugenda (2003) notes that a response rate which falls between 50 – 70 percent is adequate for data analysis. A response rate of 94.9% therefore was sufficient for this study.

### 4.3 Demographic Data

The demographic data of the respondents was analyzed based on the ward the respondent lived in, length of stay in Embakasi Constituency, gender, age and educational level.

**Figure 4.1: Ward Lived in**



**Source: Research Data (2018)**

The results in Figure 2.1 indicates that majority (32.29%) lived in Kariabangi South, 27.35% Umoja I, 20.63% Mowlem and 19.73% Umoja II. These findings show most of residents using cargo container housing live in Kariobangi South.

**Table 4.2: Length of Stay in Embakasi Constituency**

	Frequency	Percentage
Less than 5 years	10	4.5
5 – 9 years	56	25.1
10 – 15 years	72	32.3
Over 15 years	85	38.1
<b>Total</b>	<b>223</b>	<b>100</b>

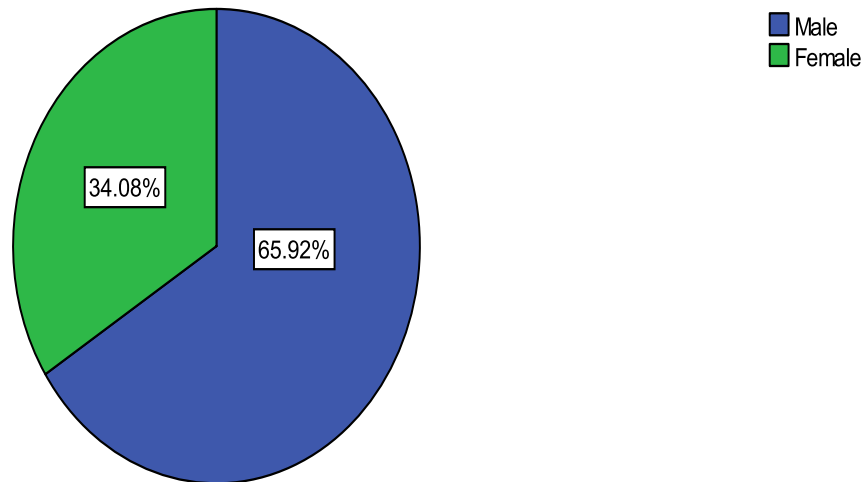
**Source: Research Data (2018)**

The results in Table 4.2 show that majority (38.1%) of the respondents had lived in Embakasi Constituency for over 15 years, 32.3% between 10 to 15 years, 25.1% between 5 to 9 years and 4.5% for less than 5 years. The cumulative frequency of 61.9% shows that majority of the respondents had lived in Embakasi constituency for more than 10 years. These findings indicate that most of the respondents who participated in the study had lived in the constituency for a

very long period of time and could give the right information regarding how cargo container houses on affordable housing.

Pena et al. (2012) demonstrate impermanent lodging plan arrangements that mean to misuse shipping compartments innate advantages identifying with quality, reusability and transportability. Load compartment lodging are more acknowledged in rental lodging typologies. The outcomes and proposals offer urban organizers, arrangement producers and engineers understanding of delivery holder private conclusion, in this manner illuminating them of the potential outcomes for transportation compartments in Kenya.

**Figure 4.2: Distribution of Respondents' Gender**



**Source: Research Data (2018)**

As per figure 4.2, majority of the respondents were male representing 65.92% of the sample while 34.08% represented female respondents. This shows a good representation of gender. Somerville (2012) has expressed that ladies have a more grounded and more positive connection to the home than men do and this is associated with their local job in the family unit. The jobs and commitments inside the hetero family unit impacts the manner by which every individual from the family observes home.

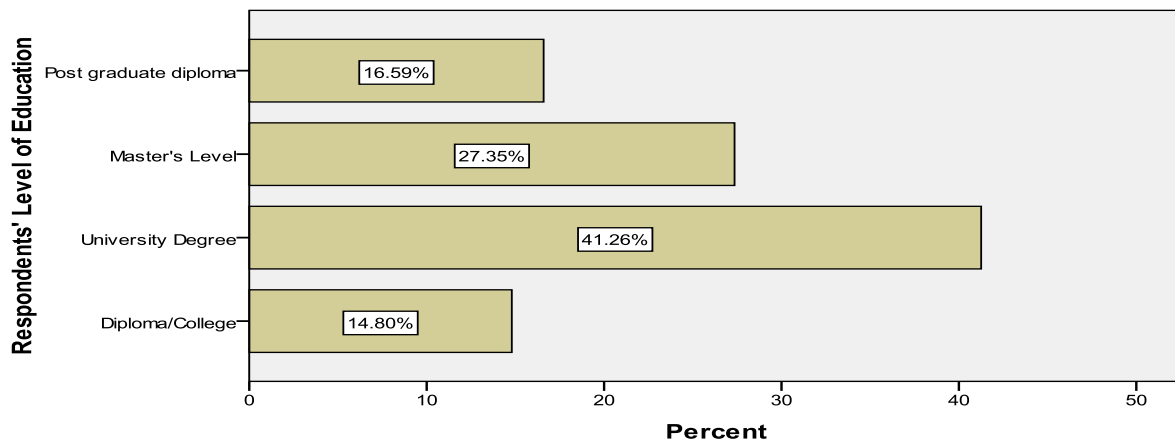
**Table 4.3: Distribution of the Respondents Age**

	<b>Frequency</b>	<b>Percentage</b>
Less than 30 years	11	4.9
30 – 39 years	52	23.3
40 – 49 years	125	56.1
50 and above years	35	15.7
<b>Total</b>	<b>223</b>	<b>100</b>

**Source: Research Data (2018)**

The results in Table 4.3 shows that most (56.1%) of the respondents were aged between 40 to 49 years, 23.3% were aged between 30 to 39 years, 15.7% aged 50 years and above and those respondents aged less than 30 years accounted for 4.9%. These findings show that the study participants were obtained from different categories of ages. The findings show a significant relationship between person’s age and preference of cargo container housing. This emanates from the fact that majority of the respondents were aged 40 years and above as shown by cumulative frequency of 61.9%.

**Figure 4.3: Distribution of Respondents’ Education Level**



**Source: Research Data (2018)**

The results in Figure 4.3 show that majority (41.26%) had attained a university Degree level of education, 27.35% had a Master’s degree level of education, 16.59% had Post Graduate Diploma and 14.80% had a Diploma/college certificate. The results are statistically correlated with higher educational attainment with cargo container housing ownership.

#### 4.4 People’s Perception of Cargo Container Housing

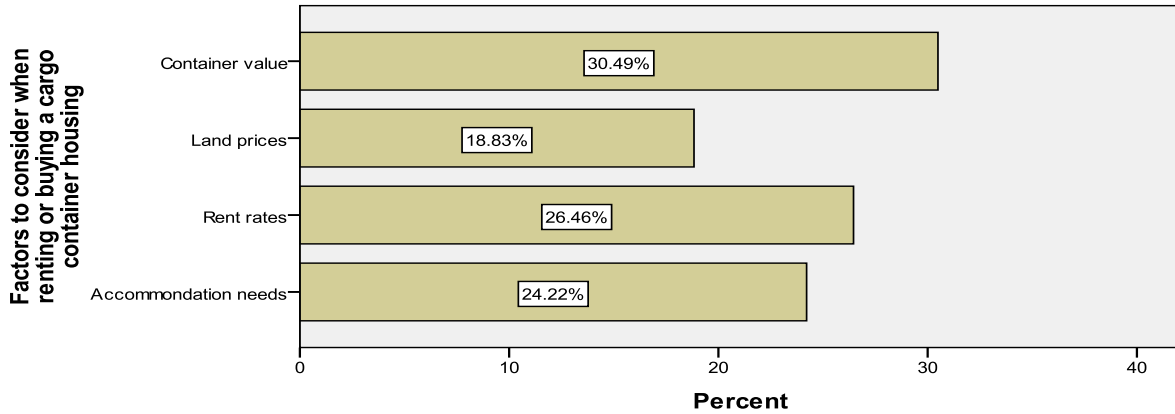
**Table 4.4: People’s Preference of Cargo container housing**

	<b>Frequency</b>	<b>Percentage</b>
Home Owner	131	58.7
Renter	65	29.1
Storing goods and for business purposes	27	12.1
<b>Total</b>	<b>223</b>	<b>100</b>

**Source: Research Data (2018)**

Table 4.4 shows that majority (58.7%) indicated that suitability of their current housing situation as home owner and 29.1% indicated as renter. The remaining (12.1%) indicated that they use cargo container housing as a method of storing goods and for business purposes. These findings speak to the findings obtained by De Asis (2012). He noted that some of the main components one need to pay attention to include the kind of foundation you want laid, space in terms of square feet required and efficiency in terms of energy. Insulation is also a key aspect when it comes to fabricating a container to a home. This helps to regulate the temperatures and more so for those in extremely cold areas. It also helps to maintain the quality of the container which in turn speaks to its durability.

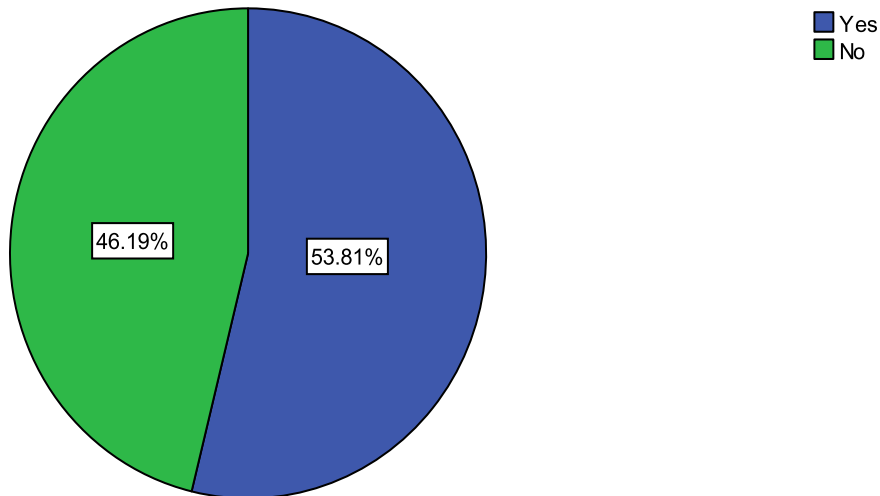
**Figure 4.4: Factors to Consider when Renting or Buying a Cargo Container**



**Source: Research Data (2018)**

The results in Figure 4.4 show that majority (30.49%) of the respondents indicated that they consider container value when renting or buying a cargo container, 26.46% rent rates, 24.22% accommodation needs and 18.83% land prices. The study further sought to establish whether the respondents would wish to buy or rent a cargo container house based on either container value, rent rates, accommodation needs and land prices and the findings are presented in Figure 4.5.

**Figure 4.5: Buy or Rent a Cargo Container House**



**Source: Research Data (2018)**

The results in Figure 4.5 indicate that majority (53.81%) agreed that they would wish to buy or rent a cargo container house while 46.19% were on the contrary. These findings agree with the findings of Balogun (2018) whose study examined on shipping container as an alternative housing solution and found that most of the respondent live in leased flats, are very taught and will acknowledge shipping compartment lodging. While a portion of the respondent think about that transportation compartment isn't proper for human residence, which is because of their point of view of delivery holder homes as far as ease.

The respondents further indicated that they can rent a cargo container housing for seasonal needs, onsite storage, temporary storage, transporting goods, flexibility as one can buy another container to suit his/ her requirements, supplementing other assets. They also indicated that they can prefer buying cargo container housing due to its long term use, can be customized to suit owner's needs, durability, convenience, cost efficiency and for investment.

Those who were on the contrary to either renting of buying cargo container housing cited reasons as they retain and transmit warmth and cool exceptionally well which prompts the issue of controlling the temperature inside. Utilized containers will in general rust rapidly in light of the fact that they have been scratched or marked while serving their essential capacity. Transportation holders are not proposed for human home and are consequently made utilizing non-human well-disposed components.



**Table 4.5: Suitability of Cargo Container Housing versus Income or Status**

<b>Response</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	77	34.5
No	146	65.5
<b>Total</b>	<b>223</b>	<b>100</b>

**Source: Research Data (2018)**

The results in Table 4.5 indicate that most of the respondents disagreed that cargo container housing suits their income or status as shown by 65.5% while 34.5% agreed. Habitat for Humanity Kenya (2016) report indicated that there is restricted access to arrive (68 percent of Kenyans are without land documentation or residency security) and deficient pay, absence of reasonable lodging fund is another constraining variable for low-salary families to enhance their lodging conditions. The respondents cited reasons as that the price of cargo container house is high, they are limited in space to accommodate all family members and it is very expensive to have an architecture that suits ones need.

#### **4.5 Affordability of Cargo Container Housing**

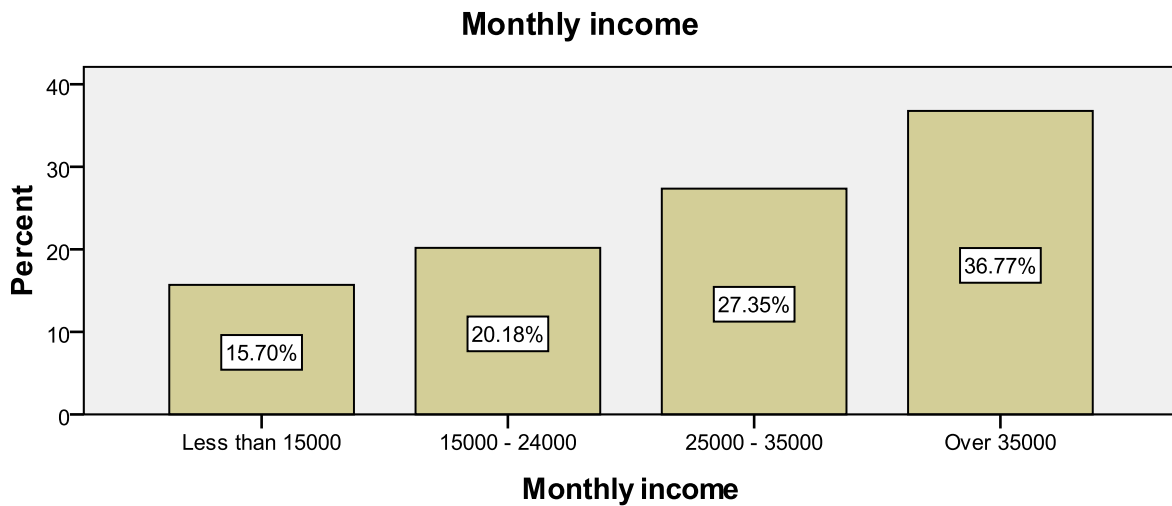
**Table 4.6: Employment Status**

	<b>Frequency</b>	<b>Percentage</b>
Unemployed	52	23.3
Employed	40	17.9
Entrepreneur	101	45.3
Retired	30	13.5
<b>Total</b>	<b>223</b>	<b>100</b>

**Source: Research Data (2018)**

The findings in Table 4.6 indicate that majority (45.3%) of the respondents indicated that they are entrepreneurs, 23.3% unemployed, 17.9% employed and 13.5% retired.

**Figure 4.6: Monthly Income**



**Source: Research Data (2018)**

The results in Figure 4.6 indicate that most of the respondents had a monthly income of over 35000 Kenyan shillings as shown by 36.77%, 27.35% earned between 25000 to 35000 Kenyan shillings, 20.18% earned between 15000 to 24000 and 15.70% earned less than 15000 Kenyan shillings. The respondents further were given a list of statements regarding affordability on cargo housing containers on affordable housing to indicate the extent to which they agree. The findings are shown in Table 4.7.

**Table 4.7: Affordability on Cargo Housing Containers**

<b>Statement</b>	<b>SA %</b>	<b>A%</b>	<b>U</b>	<b>D</b>	<b>SD</b>
Low income influence the affordability of cargo container housing	46.7	24.6	7.4	12.3	9.0
Expensive cost of housing influence the affordability of cargo container housing	27.9	57.4	6.6	3.3	4.9
Availability of capital influence the affordability of cargo container housing	37.7	53.3	4.1	3.3	1.6
Occupation influences the affordability of cargo container housing	33.6	50.8	12.3	3.3	0.0
<b>Aggregate Score</b>	<b>36.5</b>	<b>46.5</b>	<b>7.6</b>	<b>5.6</b>	<b>3.9</b>

**Source: Research Data (2018)**

The findings in Table 4.7 show that affordability on cargo housing containers affects affordability of housing to a greater extent as indicated by 36.5% of the respondents strongly agreed, 46.5% agreed, 7.6% undecided, 5.6% disagreed and 3.9% strongly disagreed. These findings are in line with Kakumu (2016) study results which established the that factor affecting affordability of housing in regarding geographical region of properties was that rental houses are more near learning institutions and work places as opposed to guarded estate communities, residential developments being constructed currently are far from the Central Business District (CBD), and lack of available land near the CBD has led to real estate developers developing in remote areas.

The statement ‘low income influence the affordability of cargo container housing’ was strongly agreed by majority (46.7%) of the respondents, 24.6% agreed, 7.4% undecided, 12.3% disagreed

and 9.0% strongly disagreed. 27.9% of the respondents agreed on the statement that expensive cost of housing influence the affordability of cargo container housing, 57.4% agreed, 6.6% undecided, 3.3% disagreed and 4.9% strongly disagreed. These findings speak to the findings obtained by Isnin, Ramli, Hashim and Ali (2012) on the sustainable issues in low cost housing alteration projects. The study concluded that little assessment and evaluation is done with regards to exposure to the materials used during construction such as asbestos, lead and solvents. All the children, workers and people in the neighborhood are at risk of exposure to the potential harm during the fabrication of containers such as dust and fumes which in turn are a health menace to all those involved.

The statement 'availability of capital influence the affordability of cargo container housing' was strongly agreed by 37.7% of the respondents, 53.3% agreed, 4.1% undecided, 3.3% disagreed and 1.6% strongly disagreed. 33.6% of the respondents strongly agreed that occupation influences the affordability of cargo container housing, 50.8% agreed, 12.3% undecided and 3.3% disagreed. This is in line with the observation by Balogun (2018) in a study on shipping container as an alternative housing solution which established that the large housing deficit in Lagos and the use of shipping containers as an alternative solution to the housing situation is largely affected by the view held by the society and especially by the middle-income earners. They have their own requirements and concerns when it comes to using shipping containers to provide affordable housing. Some of the most common concerns raised are cost, affordability and quality in comparison to the conventional building techniques.

#### 4.6 Challenges of Cargo Container Housing

The study sought to establish whether there are challenges facing cargo container housing in Embakasi. All the respondents agreed and cited reasons as customizing the design to suit owner needs is very expensive, moving the container from one point to another is also expensive and it is subject to weather changes.

The respondents were further provided with a list of statements relating to the challenges on cargo housing containers on affordable housing and the findings are shown in Table 4.8.

**Table 4.8: Challenges of Cargo Container Housing**

<b>Statement</b>	<b>SA %</b>	<b>A%</b>	<b>U</b>	<b>D</b>	<b>SD</b>
Housing built from shipping containers is limited by their dimensions	51.6	28.3	7.6	11.7	0.9
The shipping containers require reconfiguration in both the conceptual and applied projects	34.5	44.8	6.7	7.2	6.7
The deployment placement in the public environment can be problematic	39.0	50.2	6.3	4.0	0.4
Cargo container housing does suffer from insulation and comfort as the shipping container is a basically a large steel box which gets very hot during summer and very cold during winter	38.1	41.7	16.1	4.0	0.0
Cargo container may have been shipped with harmful elements that are not suitable for human environment	46.6	44.4	0.0	4.5	4.5
To build a structurally sound cargo container housing is very costly and also affects the structural integrity of the container	41.3	46.6	8.5	3.6	0.0
<b>Aggregate Score</b>	<b>41.9</b>	<b>42.7</b>	<b>7.5</b>	<b>5.8</b>	<b>2.1</b>

**Source: Research Data (2018)**

The findings in Table 4.8 show that the respondent agreed that there are challenges of cargo container housing as strongly agreed by 41.9% of the respondents, 42.7% agreed, 7.5% undecided, 5.8% disagreed and 2.1% strongly disagreed. Majority (51.6%) of the respondents strongly agreed that housing built from shipping containers is limited by their dimensions, 28.3% agreed, 7.6% undecided, 11.7% disagreed and 0.9% strongly disagreed. Majority (44.8%) of the respondents agreed that the shipping containers require reconfiguration in both the conceptual and applied projects, 34.5% strongly agreed, 7.2% disagreed and 6.7% disagreed strongly respectively. This concurs with the study findings of Olugbenga and Adekemi (2013) who observe that the study established that land play a crucial role in the delivery of effective housing. There is limited access to land in Nigeria as a result of urbanization and this is one of the issues that the urban and regional planning is looking to solve.

Majority (50.2%) of the respondents agreed that the deployment placement in the public environment can be problematic, 39.0% strongly disagreed, 6.3% undecided, 4.0% disagreed and 0.4% strongly disagreed. Majority (41.7%) of the respondents agreed that cargo container housing does suffer from insulation and comfort as the shipping container is a basically a large steel box which gets very hot during summer and very cold during winter, 38.1% strongly disagreed, 16.1% undecided and 4.0% disagreed. This concurs with Olugbenga and Adekemi (2013) study which examined the housing delivery challenges in metropolitan Lagos. The study established that land is a major factor in the provision of effective housing delivery. Enitan and Anthony (2017) study investigated on building with shipping containers: a sustainable approach to solving housing shortage in Lagos Metropolis. The study observed that most shipping

containers have been fabricated to suit temporary housing needs, to storage units, shop stalls, offices and ablution blocks.

Majority (46.6%) of the respondents strongly agreed that Cargo container may have been shipped with harmful elements that are not suitable for human environment, 44.4% agreed and 4.5% disagreed and strongly disagreed respectively. The statement that ‘to build a structurally sound cargo container housing is very costly and also affects the structural integrity of the container’ was agreed by majority (46.6%) of the respondents, 41.3% strongly agreed, 8.5% undecided and 3.6% disagreed. This concurs with the findings of a study by Chepsiror (2013) who investigated housing development challenges for the low income population in Kenya and found out that Eldoret town employed techniques such as subsidized cost of building materials, exploring modern building technologies, reduced interest rates on building finance, and outsourcing funding from international organizations, eradication of cultural setbacks to property ownership and management and revising the existing code of building which had earlier been cited as challenges to attainment of low cost housing.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presents the summary of the findings, conclusions, recommendations for policy and practice and recommendations for further studies.

### **5.2 Summary of Findings**

The main aim of this study is to investigate the implications of using container houses to provide affordable housing in Embakasi west constituency, Nairobi County. The study specifically focused on people's perceptions, affordability of container houses by the residents of Embakasi West Constituency and challenges of cargo container housing in Embakasi west constituency, Nairobi County. This study targeted cargo containers housing in Embakasi West Constituency which consists of 4 wards namely Umoja I, Umoja II, Mowlem and Kariobangi South. The respondents were owners of cargo container house who were selected using stratified sampling method. Data was collected using questionnaires and analyzed using descriptive statistics.

The study sought to examine the people's perceptions on cargo container houses on affordable housing in Embakasi west constituency, Nairobi County and established that most respondents indicated that the suitability of their current housing situation as home owner. Most of the respondents consider container value when renting or buying a cargo container followed by rent rates, accommodation needs and land prices. The respondents further indicated that they can rent a cargo container housing for seasonal needs, onsite storage, temporary storage, transporting goods, flexibility as one can buy another container to suit his/ her requirements, supplementing other assets. They also indicated that they can prefer buying cargo container housing due to its long term use, can be customized to suit owners needs, durability, convenience, cost efficiency and for investment. Those who were on the contrary to either renting of buying cargo container



housing cited reasons as they ingest and transmit warmth and chilly extremely well which prompts the issue of controlling the temperature inside. Utilized compartments will in general rust rapidly on the grounds that they have been scratched or imprinted while serving their essential capacity. Delivery holders are not proposed for human home and are therefore made utilizing non-human inviting components.

Minenhle and Alexandra (2016) carried out a study on suggestions for utilizing shipping compartments to give moderate lodging. 61 Countesses compartment private working in Windsor East, Johannesburg were chosen for this contextual investigation to uncover inhabitants' assessment. This exploration report gives the occupants' impression of transportation holder lodging improvements, in view of their experience, with the reason for, first, understanding the perspectives held towards delivery compartments as building units. The outcomes demonstrates that transportation holders have been utilized and gotten in Windsor East and that delivery compartments are more acknowledged in rental lodging typologies.

The study sought to examine the affordability of container houses by the residents of Embakasi West Constituency and established that affordability on cargo housing containers affects affordability of housing to a greater extent as indicated by 36.5% of the respondents strongly agreed, 46.5% agreed, 7.6% undecided, 5.6% disagreed and 3.9% strongly disagreed. The respondents strongly agreed that low income influence the affordability of cargo container housing as indicated by majority (46.7%) of the respondents, 24.6% agreed, 7.4% undecided, 12.3% disagreed and 9.0% strongly disagreed. 27.9% of the respondents agreed on the statement that expensive cost of housing influence the affordability of cargo container housing, 57.4% agreed, 6.6% undecided, 3.3% disagreed and 4.9% strongly disagreed.

Balogun (2018) study examined on shipping compartment as an elective lodging arrangement: Case Study Lagos, Nigeria. The examination was directed via doing an online overview utilizing Google shapes. The outcomes demonstrate that larger part of the respondent live in leased condos, are profoundly taught and will acknowledge shipping compartment lodging. While a portion of the respondent think about that transportation compartment isn't proper for human home, which is because of their point of view of delivery holder homes regarding ease.

The study sought to identify challenges of cargo container housing in Embakasi west constituency, Nairobi County and the respondent agreed that there are challenges of cargo container housing as strongly agreed by 41.9% of the respondents, 42.7% agreed, 7.5% undecided, 5.8% disagreed and 2.1% strongly disagreed. Majority (51.6%) of the respondents strongly agreed that housing built from shipping containers is limited by their dimensions, 28.3% agreed, 7.6% undecided, 11.7% disagreed and 0.9% strongly disagreed. Majority (44.8%) of the respondents agreed that the shipping containers require reconfiguration in both the conceptual and applied projects, 34.5% strongly agreed, 7.2% disagreed and 6.7 disagreed strongly disagreed respectively. Majority (50.2%) of the respondents agreed that the deployment placement in the public environment can be problematic, 39.0% strongly disagreed, 6.3% undecided, 4.0% disagreed and 0.4% strongly disagreed. Majority (41.7%) of the respondents agreed that cargo container housing does suffer from insulation and comfort as the shipping container is a basically a large steel box which gets very hot during summer and very cold during winter, 38.1% strongly disagreed, 16.1% undecided and 4.0% disagreed.

### **5.3 Conclusions**

The study concludes that people living in Embakasi Constituency have a perception that cargo container housing can be used as a home, renting purposes, storage and for transport and

consider mostly the value of the container in regard to their needs. Building cargo container housing has an aspect of cost saving aspects and their mobility. They are cheaper to build, and friendly to the environment.

The study concludes that the affordability of cargo container housing is positively correlated to affordable housing. This emanates from the fact the respondents strongly agreed that affordability on cargo housing containers affects affordability of housing to a greater extent and availability of capital influence the affordability of cargo container housing. The study also concludes that the choice of Embakasi Constituency residents in embracing cargo container homes as alternative is not in any way informed by their educational background, age, or income level.

The study concludes that cargo container housing is faced with many challenges such as customizing the design to suit owner needs is very expensive, moving the container from one point to another is also expensive and it is subject to weather changes. The challenges of affordability of housing in Embakasi Constituency are as a result of earning very little and high cost of housing.

#### **5.4 Limitations of the Study**

The need for an effective housing strategy is felt countrywide. Kenya faces an acute shortage of houses and this is attributed to the rural-urban migration, concentration of economic activities, high land costs and lack of policies and regulations that govern housing provision. All these challenges have translated into increased rental charges as the available houses are not enough to accommodate the growing population. Houses have thus become expensive and people have

resorted to makeshift structures in areas believed to be quite affordable leading to the mushrooming of slums.

This study however focused on Nairobi County, Kenya's largest city in terms of population and developmental activities, specifically Embakasi West constituency area which is home to many low and middle income earners. Embakasi West constituency has witnessed the mushrooming of houses thus a suitable location to establish whether cargo container houses could be used as an alternative. This study sought to establish whether container houses could be used to solve the current housing crisis. The study was limited to cargo container houses. It therefore sought to examine the related advantages and disadvantages associated with cargo container houses in comparison with the normal concrete homes. The study also sought to uncover the myths and misconceptions people hold in relation to container houses and to examine how these factors influence their choice of an ideal home.

### **5.5 Recommendations for Policy and Practice**

The study recommends that the financial institutions should take steps in financing people who choose for container housing. The government should encourage alternative building technologies that are cheaper to its people and can be established in urban areas which are densely populated.

On affordability of cargo container housing as an affordable housing, the study recommends that the government should encourage alternative building technologies that are cheaper to its people and can be established in urban areas which are densely populated.

It is essential for organizers to build up plans that guarantee that reasonable lodging is situated in need regions and not along the edges of the city, and where moderate lodging is that exclusive

devours just a part of a house hold's pay. The utilization of transportation compartments cuts development costs by just about a third than what block and concrete can do. In light of this vital point, this investigation prescribes engineers and modelers to investigate this building material.

### **5.6 Recommendations for Further Studies**

Remarkably, the findings of this study were based on an assessment of cargo containers used to provide affordable housing in Kenya: a case of Embakasi west constituency, Nairobi County. Therefore, it is recommended that studies of a similar nature should be carried out in other counties in Kenya. Further research ought to be carried out to analyze the implications of other potential factors which have not been explored in this study such as environmental impact on cargo container housing and potential cargo container housing on affordable housing.

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## APPENDICES

### Appendix I: Letter of Introduction

Cynthia Kaluhi Agatsiva

University of Nairobi

Nairobi

Dear Sir /Madam

#### **Re: Request for Participation in Research Study**

I am a Master of Arts student at University of Nairobi undertaking a study on ‘An Assessment of Cargo Containers used to Provide Affordable Housing in Kenya: A Case of Embakasi West Constituency, Nairobi County’ as part of the requirement for the award of Master Of Arts Degree In Sociology (Rural Sociology and Community Development).

I am therefore requesting you to take part in this study by responding to the questionnaire. All the responses provided are confidential and will only be used for academic purposes.

Yours Sincerely

Sign..... Date.....

**Cynthia Kaluhi Agatsiva**



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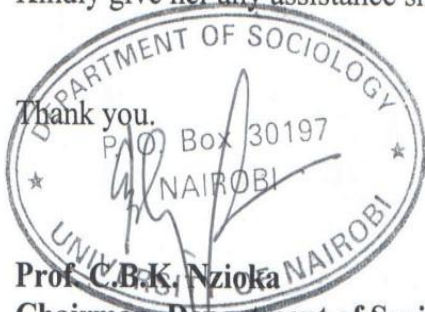
**TO WHOM IT MAY CONCERN**

**RE: CYNTHIA KALUHI AGATSIVA - C50/87800/2016**

Through this letter, I wish to confirm that the above named is a bonafide postgraduate student at the Department of Sociology & Social Work, University of Nairobi. She has presented her project proposal entitled; **“An Assessment of Cargo Containers Used to Provide Affordable Housing in Kenya: A Case of Embakasi West Constituency, Nairobi County.”**

**Cynthia** is required to collect data pertaining to the research problem from the selected organization to enable her complete her thesis which is a requirement of the Masters degree.

Kindly give her any assistance she may need.



Thank you.  
**Prof. C.B.K. Nzioka**  
Chairman, Department of Sociology & Social Work

## Appendix II: Questionnaire

### Instructions:

- i. Kindly tick [] the appropriate answer or fill in the required information on the spaces provided
- ii. Do not write your name or that of your department anywhere on this questionnaire

### Section A: Demographic Data

1. Indicate the ward you live in:

Umoja I []

Umoja II []

Mowlem []

Kariobangi South []

2. How long have you lived in Embakasi Constituency:

Less than 5 years []

5 – 9 years []

10 – 15 years []

over 15 years []

3. Gender: Male [] Female []

4. Age: Less than 30 years [] 30 – 39 years []

40 – 49 years []

50 and above []

5. What is your highest level of education?

Diploma/College []

University Degree []

Master's level []

Post-graduate Diploma []

Other (Specify).....

### Section B: People's Perception of Cargo Container Housing

Which of the following describe your current housing situation

Home owner []

Renter []

Other (specify) .....

Which of the following factors would you consider when renting or buying a cargo housing container? (Tick all that apply and rank them)

Accommodation needs

Rent Rates

Land Prices

Container Value

Other (specify).....

If container house satisfy your choice in question above, would you wish to buy or rent?

Yes  No

Please justify your answer

.....  
.....  
.....

Do you think the cargo container housing suits you income or status?

Yes  No

Give reasons to your answer.

.....  
.....  
.....

**Section C: Affordability of Cargo Container Housing**

Which of the following describe better your employment status:

Employed

Unemployed

Entrepreneur

Retired

Other (specify).....

Kindly indicate your monthly income level in Kenya Shillings

Less than 15000

15000 – 24000

25000 – 35000

Over 35000

The statements below relate to affordability on cargo housing containers on affordable housing.

Indicate the extent to which you agree or disagree with the statements on a scale of 1-5.

**Key:** Strongly agree(SA)=5, Agree(A)=4, Undecided(U)=3, Disagree(D)=2, and Strongly Disagree(SD)=1.

Statement	1	2	3	4	5
Low income influence the affordability of cargo container housing					
Expensive cost of housing influence the affordability of cargo container housing					
Availability of capital influence the affordability of cargo container housing					
Occupation influences the affordability of cargo container housing					

**Section D: Challenges of Cargo Container Housing**

Are there challenges facing cargo container housing in Embakasi?

Yes  No

If yes which ones?

.....  
.....

The statements below relate to challenges on cargo housing containers on affordable housing.

Indicate the extent to which you agree or disagree with the statements on a scale of 1-5.

**Key:** Strongly agree(SA)=5, Agree(A)=4, Undecided(U)=3, Disagree(D)=2, and Strongly Disagree(SD)=1.

<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Housing built from shipping containers is limited by their dimensions					
The shipping containers require reconfiguration in both the conceptual and applied projects					
The deployment placement in the public environment can be problematic					
Cargo container housing does suffer from insulation and comfort as the shipping container is a basically a large steel box which gets very hot during summer and very cold during winter					
Cargo container may have been shipped with harmful elements that are not suitable for human environment					
To build a structurally sound cargo container housing is very costly and also affects the structural integrity of the container					