

**MOSHI CO-OPERATIVE UNIVERSITY**

**KENYA HOUSING COOPERATIVES AND THE EXTENSION OF  
AFFORDABLE HOUSING TO THEIR MEMBERS IN NAIROBI CITY  
COUNTY**

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AFFORDABLE HOUSING TO THEIR MEMBERS IN NAIROBI CITY  
COUNTY**

**BY**

**ENOCK MOSONGO ONDUKO**

**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENT FOR  
THE DEGREE OF DOCTOR OF PHILOSOPHY OF  
MOSHI CO-OPERATIVE UNIVERSITY**

**NOVEMBER, 2023**

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I, **Enock Mosongo Onduko**, declare that this thesis is my original work and that it has not been presented and will not be presented to any other higher learning institution for a similar or any other academic award.

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**CERTIFICATION**

The undersigned certify that they have read and hereby recommend for acceptance by Moshi Co-operative University a thesis titled “Kenya Housing Cooperatives and the Extension of Affordable Housing for their Members in Nairobi City County,” in fulfilment of the requirements for the award of a degree of Doctor of Philosophy of Moshi Cooperative University

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**DEDICATION**

I would like to dedicate this work to our Almighty God, the creator of Earth and Heaven. I also dedicate it to my beloved parents: My father Elizaphan Onduko and my mother Eunice Moraa for taking care of me, and providing me with access to education up to the doctorate level. Dedication further goes to my wife Mary, to my daughters Aidel and Abigael and to my son Philemon. I dedicate the work to my siblings Hyline, Geoffrey, Kianyaga, Emily, Beatrice and Esther for their love and compassionate during my PhD study. May the Almighty God bless you abundantly.

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**LIST OF ABBREVIATIONS AND ACRONYMS**

AGM	:	Annual General Meetings
AVE	:	Average Variance Extracted
CFA	:	Confirmatory Factor Analysis
CHCM	:	Continuing Housing Co-operative Model.
CIC	:	Cooperative Insurance Company
COPRAS	:	Complex Proportional Assessment
COTU	:	Central Organisation of Trade Unions
CV	:	Coefficient of Variation
HCS	:	Housing Co-operative Society
ICA	:	International Co-operative Alliance
KMO	:	Kaiser-Meyer Olkin Measure
KMRC	:	Kenya Mortgage Refinance Company
KNBS	:	Kenya National Bureau of standards
KUSCCO	:	Kenya Union of Savings and Credit Cooperatives Society
LHCM	:	Limited Housing Co-operative Model
MCDM	:	Multiple Criteria Decision Making
MMHCM	:	Multiple Mortgage Housing Co-operative Model
NACHU	:	National Cooperative Housing Union
NACOSTI	:	National Commission for Science, Technology and Innovation
NHC	:	National Housing Corporation
PCA	:	Principal Component Analysis
RBV	:	Resource Based View
REML	:	Restricted maximum likelihood
SACCO	:	Savings and Credit Cooperatives Society
SDG	:	Sustainable Development Goals
TCT	:	Transaction costs theory

## **EXTENDED ABSTRACT**

Housing has been regarded as one of the fundamental rights of human being. Adequate housing is more than a roof over one's head. However, the biggest challenge facing resident in Nairobi City County is lack of adequate housing particularly to low- and middle-income households. This situation has been worsening by high cost of building material, high cost of land, high cost of financing, rapid urbanization, rural–urban migration and social-economic disparity among the residents. The housing cooperative model of financing can be more cost-effective than other form of mortgage in the market because the cooperative housing corporation can access both internal and external funding from different financial institutions on behalf of its members. The main objective of study was to examine the role of housing co-operatives in the provision of affordable housing for their members in Nairobi City County, Kenya. While the specific objectives of the study were as follows: To profile housing co-operative models to address shortage of affordable housing in Nairobi City County, to determine the influence of co-operative member participation on housing affordability in Nairobi City County, Kenya, to assess the effect of supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya and to examine the influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya. The study adopted a mixed method research design employing both quantitative and qualitative approach. Simple random sampling technique was used to select the 397 members from the 35 housing co-operatives and purposive sampling technique was used to select ten housing experts as key informants. Qualitative data was analysed using content analysis technique. Quantitative data was analysed using descriptive statistics (including frequency, percentages and mean). For inferential statistics, the data was analysed using multiple regression analysis and restricted maximum likelihood. The findings revealed that limited housing cooperative model was most common among the resident of Nairobi City County, followed by multiple mortgage cooperative model and lastly continue housing cooperative model. The limited housing cooperative model accommodated most of interest of low-income household in terms of financing their land. On another objective, member participation was significant predictors of housing affordability in the housing cooperative at  $p < 0.05$ . Implying that member participation had a positive relationship with housing affordability. Further, supportive environment (policy and



legislation, support services and collaboration and partnership) were significant predictors of housing affordability in the housing cooperative at  $p < 0.05$ , indicating that supportive environment determines the growth and success of housing cooperative in provision of affordable housing in Nairobi City County. Lastly, cooperative housing finance (members' savings, cooperative loan, government loan and bank loan) were significant predictors of housing affordability in the housing cooperative at  $p < 0.05$ , implying that the increase of cooperative housing finance led to high affordability of the houses provided by housing cooperatives. The study concluded that housing cooperative approach is the best in provision of affordable housing particularly to low- and middle-income groups by using various housing cooperative models. The study also concluded that housing cooperative can be a game changer in housing sector if only provided supportive environment by various stakeholders to thrive. The study recommends for adoption of housing cooperative models that take into consideration diversity of their members in terms of environmental, social, economic and cultural practices. The study also recommends that housing cooperative needs to sensitize their members about the benefits of participation in housing cooperative activities. The study further recommends for reliable and affordable long-term sources of finance for housing cooperatives in order to meet the demand of housing needs for their members. Additionally, the study recommends that government agencies should provide a favourable environment for housing co-operatives to provide affordable housing to their members. These recommendations enlighten policy makers and practitioners in housing sector to engage public on designing appropriate housing policy that address the housing needs of their people.

## CHAPTER ONE

### 1.0 Introduction

#### 1.1 Background of the Study

Every individual has a fundamental right to live in safe, acceptable, and affordable housing (UN-Habitat, 2019). Galal, (2020) argued that adequate housing has a significant impact on a various aspect of human life, including physical and mental health, quality of life, access to education, and economic implications, among many others. The World City Report (2022) indicate that approximately over 1.6 billion people worldwide reside in slums and informal settlement. In the next 30 years, an additional two billion people or nearly 183,000 people every day are anticipated to reside in slums. Over 90% of urban population are expected to live in slums in developing countries. However, Rowan *et al.*, (2022) posit that housing affordability has become a global crisis with strong negative impact on the wellbeing of people and on the exacerbation of urban inequality.

However, the most affected group with housing affordability are especially low-income households who cannot affordable housing provided by formal market. Housing affordability is frequently defined and assessed using price-to-income ratios, housing expenditure to income ration and residual income which fall under economic indicators only. According to Adabre *et al.*, 2020; Adetooto *et al.*, 2022; Haidar & Bahammam, 2021; Moghayedi *et al.*, 2021; Mulliner *et al.*, 2013) posit that the cost of affordable housing should not exceed 30% of the household's income and is the most common way of quantitatively defining affordable housing internationally. However, scholars and practitioners have increasingly criticized the use of housing price to household income ratio as inadequate measure of housing affordability which tends to be normative and ignore wider social and environmental considerations (Adabre & Chan, 2018; Haidar & Bahammam, 2021; Mulliner *et al.*, 2013).

Affordable housing, according to Wallbaum *et al.* (2012), is defined as housing with a construction cost of less than 200 USD/m<sup>2</sup> or the "shelter poverty" metric, which consider the household's capacity to pay for non-housing costs (Adabre & Chan, 2018; Mulliner *et al.*, 2013). The terms "affordable housing" and "social housing" refer to various contexts and methodologies, respectively, and are frequently not

interchangeable (Moghayedi *et al.*, 2021). But these also fail to take into account the social and environmental factors. Actually, Mulliner *et al.* (2013) and Adabre & Chan (2018) maintain that broader contextual factors cannot be ignored when looking at affordability as its definition goes beyond solely economic viability, and should consider factors such as quality, location, and access to services, as well as the longer-term affordability capacity of the household. Therefore, the study adopted this criterion of involving economic, social and environmental factors to develop housing affordability index to measure housing affordability for members of housing cooperatives.

Housing co-operative approach emerged as alternative vehicle of providing not only housing needs to their members but also create a platform where members can interact and grow socially, politically and economically (Crabtree ,2019). Housing cooperative is a member-based organization that is governed by universally acceptable cooperative principles and values (Sarfoh *et al.*,2018). Housing cooperative model is diverse in nature where by it accommodate the needs of people with different social-economic status by mobilizing them together to build houses by self-help or mutual aid (Ivo Balmer and Jean-David, 2018). The co-operative model gives residents more democratic power than they would have as renters over the management and maintenance of the property where they live (Crabtree *et al.*, 2019).

Khamis, (2022) defines housing co-operative as a legally recognized organization established for the purpose of providing housing to its members on a continuing basis. Due to their ownership interest in the co-operative, each and every one of the inhabitants is a member and owns a unit in the building. Therefore, the housing cooperative is managed by its members, who also elect the board of directors, hire the management team, and establish the requirements for membership (Malatest, and Associates, 2018).

Housing co-operative has traditionally been, and continues to be, a significant component of the housing market in several nations. According to the Profile of the Housing Cooperative Movement of 2012, housing cooperatives managed over 2,5 million dwellings in Poland, approximately 20% of the total housing stock in the country, 17% in the Czech Republic and Sweden and 15% in Norway. The report further showed that average, 10% of Europeans live in housing cooperatives

(Malatest and Associates,2018, International Cooperative Alliance,2012). In addition, the National Cooperative Housing Federation (NCHF) has built and funded 2.5 million homes in India, 75% of which are for low-income families, and has recruited the urban poor into more than 92,000 housing cooperatives, with memberships estimated to be more than 6.5 million people (ICA and ILO, 2015). The municipality of Ankara, Turkey, the union of housing building cooperatives has supplied 200,000 low and middle-income inhabitants with homes while lowering the costs of buying and renting in the city's housing market. Housing cooperatives have created a positive impact in provision of affordable housing especially to low - middle income households across the globe.

On the African continent, just 15.7 million households can afford the typical home offered by the market (Bah *et al.*, 2018). In light of the region's anticipated housing deficit of 51.4 million units (Bah *et al.*, 2018) and the estimated \$2 trillion needed to clear the backlog, it is vital to address the widespread lack of affordable housing. According to Ganapati (2014), housing cooperatives have grown relatively strong in Eastern and Southern Africa in the recent decades. For instance, Tanzania has housing cooperative membership of 6,638 delivering at least 900 units. More encouraging results are found in Zimbabwe, where 3,050 registered members of 154 housing cooperatives generated 3,200 units in the country's 10 major urban centers (UN-Habitat, 2011). Housing cooperatives in Kenya, South Africa, Tanzania, Uganda, and Zimbabwe only constructed no more than 10,000 units which is equivalent to 1.6% of the overall home supply between 1980 and 2000. However, Azeez and Allison, (2017); Ganapati (2014); and Jimoh (2012) observes that they have had limited success in producing affordable housing at scale due to unfavorable and overly demanding regulatory systems, limited access to finance, lack of active member participation as well as limited access to housing inputs, particularly affordable land and materials.

Housing cooperatives in Kenya are vibrant in provision of affordable housing to their members, however, little known. World bank (2021) indicated that cooperatives organization provided 90% of housing finance demanded by the market. This is clear indication that cooperatives in Kenya have great impact in the society. According to state department of cooperatives report of (2019) there are 447 active housing cooperatives in Kenya out of which 115 are registered in Nairobi city county making

it the city with the highest number of housing cooperatives in Kenya with a membership of 48,803. Under the Cooperative Societies Act, the National Housing Cooperative Union (NACHU) was created in 1979 as an umbrella body of primary housing cooperatives in Kenya. NACHU provides range of services to their members includes housing microfinance loans, land acquisition, building, architecture services, advice on builders and artisans, material procurement and professional consultancy (Odongo, 2018).

The government of Kenya has explicitly called for the support of cooperative sector to provide 25% of 500,000 housing units promised to Kenyan by 2022 (State Department for Co-operatives, 2018). A total of 1,980 housing investment cooperatives with a Ksh.31 billion asset base exist. According to statistics, 90% of Kenya's housing stock is made up of cooperatives (State Department for Co-operatives, 2018). In addition, the government has introduced new tax incentives for housing cooperatives of at least 400 affordable housing units built (CAHF, 2017)). Furthermore, the 35 cooperative organization have joined together to form devolved fund for housing loans with free interest mortgage to their members anchored on Africa Tenancy Purchase Initiative (ATPI) model (Odongo,2018). Therefore, housing cooperatives have a potential to provide adequate housing to their members which has not been fully utilized.

According to some studies, the success of housing co-operatives in Kenya has been hindered by lack of short- and long-term financing, unfavorable working environment, lack of member participation in cooperatives activities, shortage of land, lack of technical know-how and administrative abilities, and other factors (Njaramba, *et al.*,2018). Similarly, according to Mbuguah (2016) cited that cost of building materials, infrastructure, socioeconomic, financial deepening, legal and policy related factors affect the supply of affordable housing in Nairobi City County.

## **1.2 Statement of the Problem**

Housing affordability issues are getting worse due to increased urbanization particularly in Nairobi Capital city. A growing proportion of people with low incomes find it difficult to buy or rent a home in Nairobi city (Mose *et al.*, 2018). In addition, the cheapest newly constructed house in Nairobi County cost KSh 2,700, 000 (US\$24,590) as at 2021 which is out of reach for majority of Kenyans who are under low- and middle-income earners (Mwangi, 2021). This has led to the proliferation of

informal settlements around Nairobi County, as people cannot find adequate housing within the city (Gachanja *et al.*, 2023). According to the Centre for Affordable Housing Finance in Africa (CAHF) states that affordability in the Nairobi housing industry is affected by factors such as inadequate frameworks, lacking housing supply, high costs of land and construction, as well as limited access to financing options (County Government of Nairobi, 2018; Gachanja *et al.*, 2023; NCC & JICA, 2014).

In addition, the Kenya National Bureau of Statistics (2020) state that the housing backlog in Kenya is estimated to be 2 million units and an annual housing demand of 250,000 units. The private and public sector can only produce 50,000 housing unit with 2% of formally constructed houses targeting lower income segments of the market and account for 87% housing demand (Mwangi, 2021). The report by KNBS indicated that as at 2020, about 15.9 million out of 44.2 million Kenyans were living below poverty line with adults earning of less than Shs 5,995 monthly in urban areas, representing about 36% of the population. However, the government has made effort towards addressing acute shortage of housing through establishment of affordable housing program to boost a Big 4 Agenda pillar in 2017, formation of Boma Yangu Online Platform, formation of National Housing Corporation (NHC) and Kenya Mortgage Refinance Company (KMRC) who have not made significant impact in the housing sector. There is a general concern that, the housing options on offer by the affordable housing program are beyond the reach for many residents, especially in the lower income brackets. This led to the need for the study to analyse the housing cooperative approach in provision of affordable housing in Nairobi city county.

Locally available studies have not addressed issues of housing affordability adequately. Ronoh *et al.*, (2020) assessed the effect of financing decisions on housing co-operatives, specifically, the effect of budgeting techniques on performance of housing co-operatives. Kimanzi, *et al.*, (2019) investigated financial structure and operating efficiency of housing co-operative societies. Onchieku and Ragui (2019) examined the effect of strategic leadership on the performance of housing co-operative societies in Nairobi City County, Kenya. Similar study was done by Wangechi. (2018) who sought to establish the determinants of financial sustainability of housing co-operatives in real estate development in Kenya. From these studies it

is evident that the role of Kenya housing cooperative and the extension of affordable housing in Nairobi City County is limited.

According to Otley (2009), a comprehensive measure of housing affordability using qualitative and quantitative is more desirable in housing cooperative. Previous studies have measured housing affordability used price to income ratio, housing cost to income ration, residual budget, and perceptual approach which were found to be limited. However, attention is rarely paid to sustainable housing practices in developing countries, despite their proven capacity for reducing environmental impacts while addressing challenges of affordability (Adabre *et al.*, 2020; Ardda *et al.*, 2018; Widera, 2021). This study has adopted sustainable housing practices encompass considerations of environmental, social, and economic factors in their implementation (Mulliner *et al.*, 2013). Besides, the study's objectives were analysed using mixed effect estimator by applying restricted maximum likelihood model which has been used by many scholars in developed countries. However, limited research on the same in Kenya. This has prompted a need for deeper understanding of Kenya housing co-operatives and the extension of affordable housing for the members in Nairobi City County.

### **1.3 Research Objectives**

#### **1.3.1 Main objective**

The main objective of this study was to examine the role of housing co-operatives in the provision of affordable housing for their members in Nairobi City County, Kenya.

#### **1.3.2 Specific objectives**

- i. Profiling housing co-operative models to address shortage of affordable housing in Nairobi City County, Kenya.
- ii. Determine the influence of co-operative member participation on housing affordability in Nairobi City County, Kenya.
- iii. Assess the effect of supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya.
- iv. Examine the influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya.

## **1.4 Research Question and Hypotheses**

### **1.4.1 Research questions**

How does profiling of housing co-operative models address the shortage of affordable housing in Nairobi City County, Kenya?

### **1.4.2 Research Hypotheses (for objective two, three and four)**

The study tested the null hypotheses for objectives below:

Ho<sub>1</sub>: Housing co-operative member participation has no significant influence on housing affordability of cooperative housing in Nairobi City County, Kenya.

Ho<sub>2</sub>: Cooperative housing finance has no significant influence on housing affordability of co-operative housing of cooperative housing in Nairobi City County, Kenya.

Ho<sub>3</sub>: Supportive environment for housing co-operatives has no significant influence in the context of the “current housing affordability of cooperative housing in Nairobi City County, Kenya.

## **1.5 Justification for the Study**

Housing is one of critical component of Sustainable Development Goals (SDG) #11 of Sustainable Cities and Communities (UN-Habitat, 2021). The government of Kenya is committed to meet this requirement of SDGs by 2030. In this regard, the government establishment of affordable housing program to boost Big 4 Agenda pillar in 2017 with cooperatives sector tasked to provide 25% of the 500,000 housing units by 2022. Through profiling housing cooperatives models, various models were identified which will help policy makers to develop appropriate policy informed by data.

The study also supported by world bank report of (2021) indicated that cooperatives organizations are estimated to provide almost 90% of the total housing finance in the country for housing construction particularly to those who cannot access or qualify for mortgage finance from financial institutions. These sentiments were supported by Kenya National Bureau of Statistics Report (2020) indicating mortgage account holder in Kenya stand at 27, 993 out of population of 47 million as at the end of 2019. Therefore it important to analyze the sources of cooperative housing finance used by the housing cooperatives in financing affordable housing.



The International Co-operative Alliance has a sectoral organization called ICA Housing. It was formed to encourage the growth of cooperative housing in all nations, particularly developing nations, as a social and economic solution to the issue of housing. Kenya has huge housing backlog 2 million units; Therefore, cooperative housing model is community-based model that address the housing needs for low- and middle-income households, unlike other housing models which concentrate on high income spectrum.

Moreover, the study was supported by the World Bank Report (2015) that revealed that there is limited research on high-quality housing stock in Sub-Saharan Africa, Kenya not exceptional. However, in the absence of trustworthy and consistent data, it is extremely challenging and requires complete conceptual clarity about the current stock, occupancy, and household sizes to detect the quality or number of housing inadequacies in both formal and informal. The government has been unable to legislate and formulate relevant policies appropriate for housing co-operatives to thrive. Therefore, research on housing co-operative on affordable housing is imperative based on the current status of housing Kenya.

## **1.6 Literature Review**

### **1.6.1 Guiding theories**

The study was guided by the participatory democratic theory, resource dependence theory, transaction cost theory and pecking order theory. The four theories were selected based on the nature of the objectives of the research with different indicators for variables and concepts in which one theory would not be sufficiently enough to address all the issues of the study.

#### **1.6.1.1 Transaction costs theory (TCT)**

The concepts of transaction cost economics are used to explain the strategies organizations take to minimize the cost. To this purpose, the fundamental idea of transaction costs is to ensure that there is flow and sufficient information that inform decision making. Transaction cost theory was proposed by Williamson (1975) who argued that transaction costs (TC) are expenses caused by internal business operations of firms. Therefore, transaction costs vary from one firm to another based on efficiency and maybe economies of scale (Wiesner, 2017). Njoroge *et al.*, (2021) supports the idea that business organizations seek for strategic partners to avoid

losses. The housing co-operatives are formed specifically to address the perceived market failures (Sexton and Iskow, 1988; Hicks and Kenworthy, 1998; Cook, 1995). Coase (1937) found that transaction cost theory has become an increasingly important anchor in minimizing transaction costs in housing co-operatives like brokerage fees, legal and administrative cost, search costs, statutory costs, and financing costs. Williamson (1985) argued that transactions costs are as important as production costs or perhaps even more important because transactions costs are not easily assessed

The study suggested that transaction costs should be brought at a minimum level as possible. Williamson (1985) further argued that the critical dimensions for describing transactions costs are classified into three namely: - frequency, uncertainty; and asset specificity. He argued that transaction frequency cost can be repetitive or one-off depending on the nature of the transaction. For instance, a housing co-operative can minimize cost of financing by using their own savings. In addition, they can borrow funds with lower interest rate as housing cooperative and not as individual.

Uncertainty arises when information is missing or not communicated well to the users hence giving chance for misleading information that might cause the transaction cost to be high. These uncertainties in the housing sector may include a looming crisis of raw material, change of interest rates, change of statutory fees among others. Housing co-operative can minimize this cost by entering into contracts with the providers, Second, housing co-operative can take insurance cover for their operational activities, third, housing co-operative can work in partnership with a local and international investor who can promote and support their activities. Therefore, housing cooperatives keep transactions under a medium uncertainty where disturbances frequency and variance remain at stable levels. Williamson (1995) argues that asset specificity is the extent to which an asset can be redeployed to alternative uses without forfeiting its value. In co-operative housing, it might not be possible because of rigid construction laws prohibiting such action.

#### **1.6.1.2 Participatory democratic theory**

The study was guided by participatory democratic theory developed by Pateman in (1970). Pateman argued that an individual need to have equal power to make valuable participation for an effective decision-making process. Jeffrey (2010) observed that democratic participation allows individuals to exercise their democratic rights in various schools of participation. Thus, this would create confidence among the

members to uphold and defend their housing co-operative in one spirit. The choice of theory was necessitated by the multidisciplinary nature of the housing co-operative, which required a theory that can adequately cover the housing co-operative needs of the members and at the same time address issues of participation. The housing co-operatives fulfil the wishes and needs of the members. Kefale *et al.*, (2012) argued that members have a responsibility and obligation to support and promote co-operative activities by involvement in decision making and patronization.

In the housing co-operatives, nothing can be decided outside the members (Visković *et al.*, 2020). This is a clear indication that members are the backbone of the co-operatives and lack of active participation means that the co-operative does not exist (Sørvoll and Bengtsson, 2018). Active involvement of members in decision-making and patronization of services is what makes co-operative housing affordable. Affordability can be achieved through the pooling of resources so that their buying power is leveraged, leading to lowering the cost per member in all transactions (Sanjinés and Barenstein, 2018). Member involvement in price negotiation, participation in meetings, attending training, selection of housing location, and consultation on housing design leads to affordable housing (Taiwo and Okafor 2011). Consequently, affordability is evident when members actively participate in all stages of housing development. According to Davidson *et al.*, (2007), member participation has empowered individuals to become part and parcel of the political process, and their voice has been well recognized.

#### **1.6.1.3 Pecking order theory**

The pecking order theory of capital structure is one of the most significant theories of corporate leverage. According to the theory, organizations prefer to utilise funds generated internally such as retained earnings and reinvest back to the business rather than seeking funds from external lenders (Myers and Majluf, 1984). The pecking order theory idealizes and advises that internal financial resources must be used up before looking for outside funding. According to Myers (1984), when firms are acquiring finance from outside, it is necessary to prefer debt over equity due to the lower information costs associated with debt issues. It is argued that different types of businesses have different capital structures, resulting into distinct business

decisions for each firm. This means that organizations can think about raising money from other sources after using savings to support investments.

A study by Li, *et al.*, (2015) found that housing co-operatives typically use equity financing and very little outside loans for the construction of new dwellings. However, Njoroge *et al.*, (2021) argued that there is always a trade-off between the several financing options. For instance, loans can act as a tax shelter because interest paid on credit is tax deductible, but they also expose businesses to bankruptcy risks if they fail to make their payments (Zelia and Caetano, 2015).

The pecking order theory has been co-opted to housing cooperative like any other firm which require financing for growth. Housing co-operative members contribute to the funding of their co-operative housing' operations through member deposits and share capital. Housing cooperatives can also get money from retained margins, member loans, and short- and long-term funds (Wang, 2016). Share capital and reserves make up core capital. These funds belong to the shareholders of the housing cooperative society. The co-operative societies set aside earnings as institutional capital, a general and revenue reserve designation. The institutional capital protects members from operational risk and insufficient capital by acting as a stop gap to compensate asset losses that may arise from unfavourable economic cycles (Robb *et al.*, 2010).

This theory is important to this study because of two aspects. First, the theory offers recommendations for the types of financing that housing cooperatives can utilize to fund their housing development. The most readily available and cost-effective source of funding for housing cooperatives is seen to be internal funding. This theory is related to the variable whose focus is to investigate the effect of financing cooperative housing on housing affordability of housing cooperatives in Nairobi City County, Kenya. Second, when retained earnings have been used up before issuing share capital, pecking order suggests debt financing. Therefore, this offers a framework for making financial decisions that can lower financing costs while still ensuring an entity's life and growth.

#### **1.6.1.4 The resource dependence theory**

Organizations use a variety of structures and techniques to accomplish their objectives. Resource Dependency Theory (RDT) was developed by Pfeffer and

Salancik in 1978. The theory claims that managerial decision-making, or the lack thereof, is how strategies and structures are chosen. According to the theory, a firm's decisions to act or not to act depend on the availability of its resources. Therefore, the environment, the concentration of power and control within the firm, and the external power and control all affect how an organization is structured and makes decisions (Pfeffer, 1987). The resource dependency theory, in accordance with Cuervo (2019) examines the issue of power in interpersonal interactions. These power relationships define who has influence over the limited resources and to what extent. In other words, the entity is not only influenced by their own internal structure factors but also external factors that are beyond their control. In addition, the work of Provan, *et al.*, (1980) examines the connection between resource control and power between non-profit organizations and the umbrella organization. Provan, *et al.*, (1980) concluded that the more resources an organization has, the more power it has over other organization. Resources are connections that an organization has inside a specific community. Resources rise in proportion to the number of links an organization has to the community's elite, the number of connections it has to other member organizations and the level of demand for its services.

The resource dependency theory is co-opted to housing cooperative to demonstrate how organizations' decisions are affected by external factors. The theory makes an assumption that housing cooperative decision-making is rational and is as a result of extensive information processing (Pfeffer, 2005). In this regard, housing cooperative can expand their operations after giving due consideration to the uncertainty that the housing industry presents. Notably, ownership of internal resources has long been regarded as the key to housing cooperative success. For instance, if a housing cooperative has access to essential prime land, the land turns into a valuable resource and the cooperative can dominate the market. According Burkhardt and Brass (1990) examine knowledge as a resource of individuals in companies and their positions of power. From housing cooperative point of view, knowledge acquired by members helps the housing cooperatives to adopt new housing technology which is acquires through various networks of members and possess a stronger position of power.

Resource dependence theory bases its fundamental assumptions on the idea that the environment is inherently unstable and uncertain (Rubino and Napoli, 2020)). Another assumption is that businesses engage with their surroundings through open

systems, and also that the organization's ability to make decisions based on logical information processing is dependent on both internal and external processes. According to RDT, an entity's ability to obtain resources and maintain those resources is essential to its life (O'Keeffe, 2016). However, management needs and information access are not always perfectly aligned, which results in constrained rationality. The concept of bounded rationality describes the constraints placed on decision-makers as a result of the complexity of information processing.

## **1.6.2 Empirical Review**

The empirical literature reviewed in this section is discussed in relation to the objectives of the research on which this thesis is based on.

### **1.6.2.1 Profiling housing co-operative models in addressing shortage of affordable housing in Nairobi City County, Kenya**

According to Crabtree *et al.*, (2019) limited-equity co-operatives are a type of homeownership that is intended to make housing more affordable over the long term by limiting the value of its membership shares. Additionally, the model offers cheap housing where a housing cooperative owns the structures and each member has a share that ensures their right to reside in cooperative housing. The market equity co-operative model, as mentioned by Malatesta and associates (2018) and Jimoh (2012h), is a paradigm shift in which co-operative housing is fully supported by its members and its value is decided by the forces of the market. Although the approach has increased market diversity and growth for housing cooperatives, it does not always equate to more affordable housing.

The Non-Equity Co-operative Model, according to Crabtree *et al.*, (2019) is a model that requires a member to pay a small fee to join the cooperative housing and rent is set to ensure the cooperative covers the essential upkeep and maintenance costs of the housing property. Due to the reasonable membership price, the approach is appropriate for low- and moderate-income groups. Limited housing cooperative tenure, according to Nguluma (2016) and Jimoh (2012), is a concept in which a housing cooperative buys land and splits it up into plots for each member after achieving its goal, at which point the housing cooperative can be dissolved.

The tenant co-operative model is a model that allows the tenant /resident to join the co-operative housing by paying monthly rent. Rents are fixed to cater for the cost of

land, construction, administration, financing, repairs, and long-term maintenance (International Co-operative Alliance, 2012). Each resident has the exclusive right to participate in all the activities of the co-operative including the setting of the monthly rent. This model is appropriate for the residents/tenant to own the housing unit they are living in perpetuity and this is the effective way of preserving affordable housing for housing co-operatives.

Another model is multiple mortgage model whereby the cooperative owns and maintains the common grounds and facilities while the members own their individual plots of land and housing units (Bunce, 2013). According to Bunce (2013), this is the ideal model because the member has a loan agreement with a financial institution, the member is free to sell his or her unit whenever he or she wants. In Continuous Housing Co-operative Model (Social Housing Foundation, 2005) ownership of the residence is held jointly, and each member is given a share that ensures his or her right to inhabit the housing units (Jimoh, 2012). As long as housing cooperatives receive the necessary support, housing cooperative tenure types can be implemented in any nation.

Indeed, the housing cooperative model varies from nation to nation. This is due to the fact that each country has different legal, financial, and social-cultural systems. Therefore, it might not be feasible to replicate the housing cooperative concept from one nation to another. Any of the aforementioned models could not operate as intended if they are replicated for the Kenyan environment. Therefore, it is important to profile housing cooperative models, especially now that the nation is experiencing a severe housing scarcity. Therefore, the study was interested to profile the housing cooperative models used in housing cooperative in Nairobi City County, Kenya and assess suitability of the housing cooperative model in addressing housing affordability in Nairobi City County, Kenya. The study used the following parameters to profile housing cooperative models namely; formation, finance, ownership, and management to meet these goals.

#### **1.6.2.2 Housing co-operative member participation and housing affordability in Nairobi City County, Kenya**

According to Hidayati *et al.*, (2016) and Fathorrozi (2004) defines participation as an individual's mental and emotional commitment to a group that inspires him or her to

contribute and share responsibility for achieving the organization's goals. Further, Hidayati *et al.*, (2016) stated that members' participation is critical component for participatory value in co-operatives which are rooted in the cooperative's principles and values. Visković *et al.*, (2020) argue that active member participation in the planning and designing, building, managing, and cohabiting, which reduced the total construction cost. A study conducted by Sushila *et al.*, (2010) among co-operatives in Malaysia found that members participated in the policy-making process through attending meetings and patronizing cooperative products and services that led to affordable housing.

Ronoh *et al.*, (2020) study reported that members participated in preparing the budget for their operation that increased performance. Sanjinés and Barenstein (2018) argued that members participate through the pooling of resources so that their buying power is leveraged, leading to lowering the cost per member in all transactions. Taiwo and Okafor (2011) study echoed the same sentiments that member involvement in price negotiation, participation in meetings, attending training, selection of housing location, and consultation on housing design led to affordable housing. However, according to Kefale *et al.*, (2012), the level of participation in cooperatives differ from one member to another in various activities such as attending meetings, selling and buying produce, purchasing agricultural inputs from the cooperative, participating in general assembly and in experience sharing's, but it is weak in dividend or sharing profits, training, leadership and participation in buying additional shares to reduce capital deficiency of the cooperative.

According to Chirisa *et al.*, (2014) members of housing co-operatives participated through contributions towards a capital share contribution, building material, constructions, and attending the general meeting that led to affordable housing. Jimoh and van Wyk (2012) reported that members of the housing cooperative participated in the training, financial contribution, attending the meeting, procurement of materials, and land acquisition. Junusi (2009) indicated that Low performance of cooperatives is influenced by lack of participation, commitment and ability to innovate from members in managing cooperatives. Hidayati *et al.*, (2016) argued that co-operative should have more attention about improving its services, which this will led to strengthening and expanding members' involvement or participation in the cooperative activities



Mousa *et al.*, (2019) found that members have the least amount of participation in the consultation and contemplation stages of cooperative operations, as planning and decision-making activities are largely conducted by management. However, various scholars (Ganapati,2014; Kwayu *et al.*, 2014; Mmbando *et al.*, 2015) have contrary opinion about member participation in housing cooperative activities with what Mousa *et al.* (2019) held. Dayanandan, 2016; Faysse *et al.*, 2015 reported that women participation in cooperatives by physically interacting with other members lead to effective and active participation. Davidson *et al.*, (2007) observed that participation in housing projects has also been found to play an important role in empowering beneficiaries or community members to become part of the general political process and to have a voice in decisions that shape the community.

Sørvoll and Bengtsson (2018) posit that members' participation will be at its highest if the cooperatives' services meet or surpass their members' expectations. By increasing member participation, the cooperative will have more opportunities to develop its benefits, which will ultimately lead to higher organizational performance. Therefore, this study examined the following specific objectives under member participation variable: (i) to analyze member socioeconomic characteristics on housing affordability in the housing co-operatives, (ii) to describe the level of members' participation in the housing co-operatives, and (iii) to examine the influence of members' involvement on housing affordability in housing co-operatives in Nairobi City County, Kenya.

### **1.6.2.3 Supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya**

According to Hassan (2012), it is not government's job to deliver housing but to provide conducive environment at which housing market can work effectively. Groeneveld (2016) defined enabling environment for co-operatives as the degree to which nations, governments and societies support and foster establishment and development of co-operative organisations in line with the co-operative principles. Koh *et al.*, (2014) argued that inhibitory laws, regulations and procedures, absent/ineffective standards, inhibitory taxes and subsidies affected the performance of the cooperatives. This explains Gruber and Lang (2018); Lang and Stoeger (2018). surveys in five countries (France, the Netherlands, Germany, Austria and the UK)

which reported that policies, regulation and practices were given much emphasis in provision of affordable housing.

Ganapati (2014) cites government support as a critical resource in terms of access to land and subsidized financing to boost the formation of housing co-operatives. Nguluma (2016) observed that financing model, and inappropriate housing policies affected the performance of housing co-operatives. Marunga. and Mberengwa (2014); Durodola *et al.* (2016) found that high cost of on-site and offsite infrastructure, high cost of land and mismanagement of funds affected the housing affordability.

According to Ferreri and Vidal (2021) appropriate legal and policy mechanisms promote housing co-operatives in accessing affordable housing. Czischke (2018) found that collaboration and partnerships with key stakeholders in housing sector facilitated access to key resources and professional expertise. According to Nade (2020), the internal enabling factors include member empowerment, improved internal governance and innovation. Nade further observed that external enablers include strengthened co-operative support institution, favourable policies, and regulations and finally stable economic, political and cultural environment tend to improve the performance of the cooperative. Housing in urban spaces has become intensely financialised not only through the securitisation of mortgaged homeownership (Aalbers, 2016) but also through the recent penetration of financial capital in rental markets (Beswick *et al.*, 2016).

Olanrewaju *et al.*, (2016) postulate that housing industry is affected by policies, regulations, legal issues, market, economic and the construction industry. Hassan (2011) found that setting a successful housing policy should associate several caring interventions in order to enable housing markets and participation. These interventions should integrate the following areas: (1) Setting up the regulatory framework, (2) reforming government institutions, (3) ensuring the availability of the components of housing supply, (4) improving partnerships, (5) accepting the informal sector as a partner, (6) enabling several mechanisms of Housing finance and Land assembly. Against this backdrop, the paper examined supportive environment for housing co-operatives in the Context of the “current housing affordability” in Nairobi City County, Kenya and specific objectives are: i) to determine the supportive environment for housing co-operatives, ii) to examine the relationship between

supportive environment for housing co-operatives and housing affordability. Supportive environment was measured by the following indicators policy and legislative, collaboration and partnership and support services.

#### **1.6.2.4 Influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya**

Housing cooperatives may be financed from retained margins, housing loans; mortgage loans for housing; securitisation; housing micro finance and equity method (Wang, 2016). According to Robb *et al.*, (2010) co-operatives need to be able to obtain enough equity capital to cover their long-term investment needs in order to continue operating effectively. Housing cooperative mobilize savings from their members which allow them to access affordable financing without any collateral (Sørvoll and Bengtsson, 2020). Li *et al.*, (2015) found that housing co-operatives typically use equity financing and very little outside loans for the construction of new dwellings. For instance, loans can act as a tax shelter because interest paid on credit is tax deductible, but they also expose businesses to bankruptcy risks if they fail to make their payments (Zelia and Caetano, 2015). Savings is more than just a way to pay for housing improvements in this case, as it is in Malawi where community-based savings groups serve as the central organizing "glue" that binds local organizations together, allowing them to develop the trust and confidence necessary to establish shared priorities and carry out joint development projects (Mitlin, 2008).

According to Yiwei Xie (2014), government has several ways of funding affordable housing for low-income households at a cheaper price or rent by directly investing in the building or by providing a specific type of government subsidy to the housing construction agency. In comparison to traditional banks, the Canadian housing and mortgage corporation provides financing options for the construction of affordable housing developments with lower interest rates and longer amortization periods, which helps to improve the development's overall financial viability (CMHC, 2021).

Merrill *et al.*, (2007) argues that cooperative loans are short term loans created for low- and moderate-income households to build, enlarge or improve their housing units gradually by relying on successive microloans. Cooperative loans lending is the most effective lending method or approach for meeting the housing finance needs of specific low-income populations (Bondinuba *et al.*, 2016). According to Smets (2006), small loans are ideal because they complement the poor's incremental

construction and financing tactics, allowing them to construct and enhance their homes in a manner that is more convenient for their financial situation and institutional setting.

Many urban households do not participate in the mortgage finance system and use alternative methods to finance housing construction (Gulter and Basti, 2014). In contrast to many developing nations with underdeveloped macroeconomic and inadequate regulatory frameworks, mortgage finance functions better in industrialized economies (Badev *et al.*, 2014; Nguena *et al.*, 2016; Teye *et al.*, 2015). Mortgage financing is realistically inappropriate for a substantial percentage of families in developing countries, according to poor housing finance metrics including mortgage depth and housing loan penetration (Ferguson and Smets, 2010; Badev, *et al.*, 2014). In addition, mortgage tightening, access to homeownership increasingly relies on top-down intergenerational support, which has become a central driver of inequality (Palomera, 2020).

Toruluccio and Dorakh, (2015) established that cost of housing is high due to high interest rates on mortgages and cost of construction materials. They observed that cost of housing has negative effect on affordability of housing. Yusof, *et al.*, (2017) established a significant relationship between home financing and home ownership. The study further revealed a negative and relationship between the level of interest rates on home financing and the housing affordability. This implies that low interest rates on home financing loans reduce the cost of housing and thus increasing the affordability of housing in the country. High house prices, high transaction costs and reduced access to mortgages also contribute to the decline in home ownership among young households (Whitehead and Williams, 2017).

Therefore, the paper examined the influence of cooperative housing finance on housing affordability in Nairobi City County, Kenya. the specific objective of the paper; i) to analysis various sources of cooperative housing finance as used by housing co-operatives, ii), to examine the influence of cooperative housing finance on housing affordability of housing cooperatives. Cooperative housing finance was measured by the following indicators member saving, cooperative loan, government loan and bank loan.

### **1.6.3 Brief history of housing co-operatives in Kenya**

The modern housing co-operatives can be traced back to 1980 when the umbrella body National Co-operative Housing Union (NACHU) was formed (Bah *et al.*, 2018). The process of forming umbrella body was initiated by the Central Organisation of Trade Unions (COTU) for the purpose of improving the living condition in terms of housing for its members (NACHU, 2010). There were 650 registered housing co-operatives affiliated to National Co-operative Housing Union (NACHU) with only 248 being active with 400 others being dormant (Cooperative Yearbook Kenya, 2013). The role of NACHU is to provide services, including technical advice on construction and programming targeted at low-income groups (Merrill *et al.*, 2007). This includes projects that allow residents of informal settlements to upgrade their dwellings or to add on to their existing homes in order to create additional space which can be rented out (Houston, 2010).

Housing cooperative are organised and controlled by their members. Housing cooperatives is registered by the commissioner of cooperative after provision of by-laws, memorandum of understanding, the list of promoters and the minutes of the meeting. After registration, the housing cooperative start their operation as legal entity. The housing cooperative is required to hold annually general meeting to elect their official and transact other business according to the procedure and statutes of the cooperative society Act (Wanyama,2009). The board members range from 5 to 11 depending on the size of the housing cooperative. More so, the co-operative legislation is designed to encourage more women in leadership in housing co-operatives (Alder and Munene, 2006). The ideal housing cooperative have three sub-committees: the projects subcommittee, the finance subcommittee and the executive committee (Alder and Munene, 2006). Most of the housing cooperative employs a general manager as the chief executive and have various departments such as project development, education and training, and finance and administration (Alder and Munene, 2006).

The housing cooperatives are financed by membership fund and sometime this fund is not enough, then the housing cooperative obtain more funds from lenders for smooth run of their operations. The loan from outside can be accessed through cooperative bank, NACHU, CIC, KUSCCO, and Savings and Credit Cooperatives Society (SACCO). These funds from cooperative bear the lower interest rate

compared to traditional banks (International labour organisation, 2010). NACHU through their development partners, specific primary housing cooperatives may benefit from grants and donations for housing development.

However, there has been acute challenge for financing primary housing cooperative due to their meagre income. Given the stated challenges, poor level of income and lack of access to affordable financing has elicited a critical need for an economic incentive for its members. This has made some housing cooperatives opt into the housing and rental market as business owners and moving away from the goal of homeownership (World bank 2017). Another challenge for housing cooperatives is the lack of enabling environment for homeownership due to high land prices in the cities. Other challenges include corruption and expensive mortgages. With an expected annual growth rate of urbanization of 1.97%, Kenya's cities will continue to grow in an environment where the housing market targets middle and high-income earners (Mwau and Sverdlik, 2020). With this in mind, affordable housing cannot be ignored in light of increasing urbanization.

There are different types of housing cooperatives in Kenya. Consumer co-operative housing cooperative and produce housing cooperatives. Consumer housing cooperatives provide housing for their members for residential purposes. While produce housing cooperative provide housing for commercial purposes. Both types of housing adhere to cooperative principles and values. The most common type of housing is consumer housing cooperatives. These housing cooperatives are further classified as land buying housing cooperative, building housing cooperative and management housing cooperatives (UN-Habitat,2010). The land buying housing cooperatives are the most common in Kenya with largest market share. The main objective of this kind of cooperative is to buy land collectively and subdivide amongst the members (Wanyama, *et al.*,2009).

The building housing cooperatives are ones in charge of construction of cooperative housing. These housing cooperatives must have enough personnel in terms of human experts in various stages of constructions and huge capital to jump start the project before funds are made available by beneficiary. These kinds of cooperative are very few in Kenya, the common one is national cooperative housing union (NACHU). These cooperatives operate across the country and have representative from each county who attend in their board of directors. The management type of housing

cooperative mobilizes saving from members for housing development. In addition, they ensure they have enough fund for housing development. Sometimes this housing cooperative subcontract the service of construction to the third party who could be a private firm or the building housing cooperative. Mostly, the management housing cooperative work hand in hand with building-housing cooperative for construction and at the same time financing it.

The membership of housing cooperative consists of employees from the private and public sectors, members of investment organizations, owners of small enterprises, and people with a variety of racial and religious backgrounds (UN-Habitat,2010). The majority of housing cooperatives are concentrated in urban centres where there is acute shortage of affordable housing. These housing cooperatives are institutionalised-based organisation. Therefore, they form strategic alliance with their employer to facilitate them with adequate housing through provision of financing which is paid by employee through monthly deduction. Further, some housing cooperative can form collaboration and partnership with other firm in the housing industry for provision of affordable housing to members.

In general, poor performance of housing cooperatives in Kenya has been accelerated by many factors including lack of short- and long-term financing, lack of active member participation, shortage of land, lack of technical know-how and administrative abilities, among other factors (Wanyama *et al.*, 2009). Moreover, the housing cooperative policy meant to address the issues of members of housing cooperatives is lacking hence make housing cooperative sector not in a position to discharge their duties effectively and efficiently (Baitu, 2010).

#### **1.6.4 Measurement of housing affordability**

Housing affordability is widely considered as one of the biggest issues confronting people today (Meen, 2018). However, the most affected group with housing affordability are especially low-income households who cannot affordable housing provided by formal market. Housing affordability is frequently defined and assessed using economic indicators only. The most common way of quantitatively defining affordable housing internationally states that this housing type should not cost more than 30% of the household's income (Adabre *et al.*, 2020; Adetooto *et al.*, 2022; Haidar & Bahammam, 2021; Moghayedi *et al.*, 2021; Mulliner *et al.*, 2013).

However, in current literature, this definition has increasingly been criticized, as using a ratio of housing price to household income tends to be normative and ignore wider social and environmental considerations (Adabre & Chan, 2018; Haidar & Bahammam, 2021; Mulliner *et al.*, 2013). Other definitions include Wallbaum *et al.* (2012)'s claim that affordable housing is housing that costs less than 200 USD/m<sup>2</sup> to construct, or the measure of “shelter poverty” which also considers a household's ability to cover non-housing costs (Adabre & Chan, 2018; Mulliner *et al.*, 2013). Definitions of affordable housing often differ from definitions such as social housing, or informal settlement upgrading, which refer to different context and methods of approach (Moghayedi *et al.*, 2021). Yet the social and environmental considerations are also not accounted for in these. Indeed, Mulliner *et al.* (2013) and Adabre & Chan (2018) argue that wider contextual factors cannot be ignored when looking at affordability as its definition goes beyond solely economic viability, and should consider factors such as quality, location, and access to services, as well as the longer-term affordability capacity of the household. This is the criteria that the study adopted for assessing housing affordability for members of housing cooperative in Nairobi City County, Kenya.

The measurement of the dependent variable (housing affordability) sought to determine the level of importance that the participants members gave on proposed factors of affordability that were retained in the pilot study. Respondents ranked the housing affordability criteria in relation to their housing cooperatives on an ordinal scale of importance with the categories where 1-not important at all, 2-less important, 3-important and 4-most important. The housing affordability index was developed through a process that started with the indemnification of broad factors for measuring affordability in which 26 were found as shown in table 3.10. Then a factor analysis was undertaken resulting into a retention of 18 factors from the initial 26 as indicated in table 3.11. The 18 factors are: Land Acquisition, House Finishing, Safety and security of properties, Leasehold / Freehold House, Interest rates and mortgage availability, Size of the House, Near to public schools, Near to public transport, Near to workplace, Near to health care centers, Near to childcare facilities, Water and Energy Efficiency, Materials and waste management, Indoor environmental quality, Near to shopping facilities, Recreational facilities, Traffic Congestion, External pollution. The indicators were reduced to a single overall index of housing



affordability which was calculated as a weighted average of the ordinal scores from the indicator responses of the dependent variable. The weights for the indicators were determined by dividing the mean score by the sum of mean scores and multiplying by 100 as given by the equation below. The overall mean score of housing affordability index was 3.202 with a standard deviation of 0.805 and coefficient of variation of 25.13%.

$$\omega_i = \frac{\bar{X}_i}{\sum_{i=1}^{18} \bar{X}_i} \times 100$$

Where ;

$\omega_i$  is the weight of indicator i

$\bar{X}_i$  is the mean of indicator i

**Table 1.1: Common Metrics to Assess Housing Affordability**

Type of measure	Example of indicators	Advantages	Limitations	Authors
Price-to-income ratios	<ul style="list-style-type: none"> <li>▪ House-price-to-income ratio</li> <li>▪ Rent-price-to-income ratio</li> </ul>	<ul style="list-style-type: none"> <li>▪ Relatively straightforward, intuitive</li> <li>▪ Relies on data that are generally readily available in most countries</li> <li>▪ Shows, at aggregate level, how the association between prices and income varies over time and/or across markets, such as across Countries</li> </ul>	<ul style="list-style-type: none"> <li>▪ Does not provide any indication of the distribution of housing costs and housing affordability (e.g. who has/does not have access to affordable housing)</li> <li>▪ Does not provide any indication of housing quality</li> <li>▪ Does not take into account borrowing costs</li> </ul>	OECD, (2021), Affordable Housing - CPD - HUD" (2017) Jiboy. (2011). Whitehead, <i>et al.</i> , (2009) Abdoli, <i>et al.</i> , (2012). Chen <i>et al.</i> , (2010). Sani, (2015)
Housing expenditure-to-income ratios	<ul style="list-style-type: none"> <li>▪ Housing cost burden</li> <li>▪ Housing cost overburden rate (e.g. share of households spending over 40% of disposable income on housing costs)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Relatively straightforward, intuitive</li> <li>▪ Relies on data that are generally readily available in most countries</li> <li>▪ Can be disaggregated to measure actual housing spending at household level</li> </ul>	<ul style="list-style-type: none"> <li>▪ "Overburden" threshold is set at an arbitrary level that remains fixed, regardless of household characteristics or their position in the income distribution</li> <li>▪ Does not provide any indication of housing quality</li> </ul>	OECD, (2021), Jiboy. (2011). Whitehead, <i>et al.</i> , (2009) Abdoli, <i>et al.</i> , (2012) Zi Cai, (2017)
Residual income measures	<ul style="list-style-type: none"> <li>▪ Shelter poverty</li> <li>▪ Housing-induced poverty</li> </ul>	<ul style="list-style-type: none"> <li>▪ Captures the level of income a household has left after paying for housing costs, to assess the extent to which households have sufficient income left for non-housing expenses after paying for housing</li> <li>▪ Can be useful to measure affordability gaps among vulnerable low- and middle-income households</li> </ul>	<ul style="list-style-type: none"> <li>▪ Can require extensive additional data collection on the cost of the minimum basket of non-housing expenses</li> <li>▪ Arbitrariness with respect to what constitutes the minimum income a household needs for non-housing expenses</li> <li>▪ Does not provide any indication of housing quality (e.g. what households are paying for)</li> <li>▪ Can misdiagnose general cost-of-living problems as cost-of-housing problems</li> </ul>	Stone, (2006) Stone, Burke and Ralston, (2011) OECD (2021) Zi Cai, (2017)
Housing quality measures	<ul style="list-style-type: none"> <li>▪ Rooms per person</li> <li>▪ Overcrowding rate</li> <li>▪ Housing deprivation rate</li> </ul>	<ul style="list-style-type: none"> <li>▪ Overcrowding can be assessed based on a very simple (or more complex) definition</li> <li>▪ Provides insights into a key dimension of housing affordability, e.g. what households are paying for</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential trade-offs between social and environmental objectives when interpreting indicators relating to dwelling size</li> <li>▪ Cross-country/cultural differences in what characteristics are most relevant to assess housing quality</li> <li>▪ Some quality metrics require up-to-date data on technical characteristics of dwellings, which may not be readily Available</li> </ul>	OECD (2021) Maliene and Malys (2009). Winston (2010).
Subjective indicators of housing affordability	<ul style="list-style-type: none"> <li>▪ Satisfaction with the availability of good, affordable housing</li> <li>▪ Housing as a key short-term concern</li> </ul>	<ul style="list-style-type: none"> <li>□ Can complement other measures of housing outcomes and can help better understand the determinants of housing satisfaction</li> </ul>	Perceptions and expectations about what constitute good-quality affordable housing differ across individuals, countries and cultures, and may also depend on socio-demographic characteristics Satisfaction levels may depend on country-specific factors, including the overall economic environment, and/or the level of social protection policies	Zi Cai (2017), OECD (2021)

Source: OECD (2021)

### 1.6.5 Research Gap

A number of previous studies have focused on the role of housing cooperatives and general performance, however; they have not been able to link it with affordability. Such studies include ones by Ronoh *et al.*, (2020), Kimanzi *et al.*, (2019), Onchieku and Ragui (2019) and Wangechi (2018) who attempted to explain the role of housing cooperative in terms of challenges, efficiency, governance and management no direct link was found between the functionality of the housing cooperatives and housing affordability. However, this study is linking sustainable practices such as environmental, social and economic to housing affordability.

Globally, housing cooperatives are becoming more prevalent. They offer a variety of housing options to different household types throughout the economic spectrum, typically servicing low- and moderate-income households. International research demonstrates that housing cooperatives model can offer a variety of dwellings, in both urban and non-urban settings and at prices ranging from extremely low to market rate (Crabtree *et.al.*, 2019; Cabré and Andrés, 2018; Larsen, 2019; Scheller and Larsen, 2019 Mara and Lorenzo 2022). However, their conclusions cannot be generalized internationally due to social, legal and economic disparities between the nations where the studies were conducted and Kenya. It was required to evaluate the local context about the influence of housing cooperative models on housing affordability in the study on which this thesis is based.

Furthermore, unlike earlier related studies that were primarily based on economic theories, the current study is guided by economic theories and co-operative theories. The transaction cost theory has grown in significance as a pillar for reducing transaction costs in housing cooperatives, such as brokerage fees, legal and administrative expenses, search expenses, statutory expenses, and financing expenses. The pecking order theory argues that firms are financed by both equity and debt. A study by Li, *et al.*, (2015) found that housing co-operatives typically use equity financing and very little outside loans for the construction of new dwellings.

The resource dependency theory claims that managerial decision-making, or the lack thereof, is how strategies and structures are chosen. According to the theory, a firm's decisions to act or not to act depend on the availability of its resources. Democratic participation allows individuals to exercise their democratic rights in various schools

of participation. In turn, this creates confidence among the members to uphold and defend their housing co-operative in one spirit. Additionally, the study on which this thesis is based utilized triangulation for the collection of both qualitative and quantitative data with modern housing cooperatives with different housing cooperatives models.

The implication of the argument is that there has been limited clear information on the housing cooperative models and their potential in terms of provision of affordable housing. The aforementioned previous studies focused on general performance of housing cooperatives but downplayed affordability as a measure of performance in housing. There is also scarcity of knowledge on housing cooperative models on their potential and features in providing affordable housing. The assumption is that the government should provide supportive environment for housing cooperatives members to take active participation in all the housing projects. This study therefore examined the influence of housing cooperative on housing affordability. Thus, the study wanted to fill this knowledge gap (contextual, methodological and theoretical) by assessing the role of Kenya housing co-operatives and the extension of affordable housing for their members in urban setting: a case study of Nairobi City County.

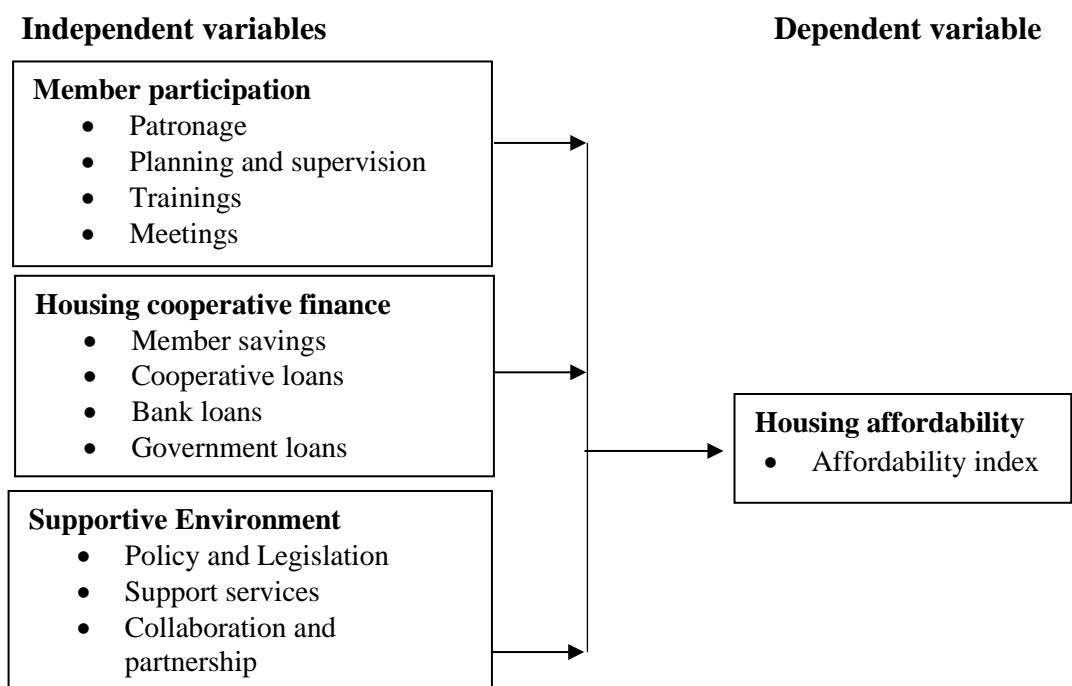
#### **1.6.6 Conceptual Framework**

The conceptual model depicts the relationship between housing cooperative and housing affordability. The variables of the study were generated from the theoretical and empirical literature both local and international studies. The independent and dependent variables were housing cooperative and housing affordability respectively. Several studies have revealed a linear relationship between housing cooperative and housing affordability. Nonetheless, this study introduces components of profiling housing cooperative models, member participation, supportive environment and housing cooperative finance to establish the link and effect on the housing affordability. Despite many studies adopting the use of general performance, this study purposively used housing affordability to assess the ability of the housing cooperatives and members in terms of provision of affordable housing units.

The empirical literature on housing cooperatives show that several factors influence the affordability of housing delivered by housing cooperatives. These factors include profiling housing cooperative models, member participation, supportive environment

and housing cooperative finance. Profiling housing cooperative models were measured using formation, organization, financing and management. Member participation was measured using various indicators which were reduced to one overall member participation index. Supportive environment was measured using three sub dimensions (legislative and policy, collaboration and partnership and support services). Housing cooperative finance was measured using the four sources of home finance as its sub dimensions (member savings, co-operative loans, bank loan and government loan)

The study was measured by broader range of quantitative and qualitative criteria towards achieving actual housing affordability such as but not limited to, social wellbeing, neighborhood and location issues. In addition, the study considered the sustainability and health concerns, housing standards and appropriateness, housing market, transportation cost as well as households and their quality of life (Rowley and Ong 2012; Fisher *et al.*,2009; and Isalou, *et al.*,2014) instead of exclusively focusing on income and housing price as the prime determinants.



**Figure 1.1: Conceptual Framework**

Source: Author, 2022

## **1.7 General Methodology**

### **1.7.1 Research philosophy**

Philosophy is a system of thought that helps people find solutions to their problems. A foundational tenet upon which study and advancement in a field of inquiry are built is the research philosophy (Saunders *et al.*, 2009). The three most popular research philosophies are that support social science research are positivism, phenomenology, pragmatism, or mixed methodologies approaches (Johnson *et al.*, 2007).

A philosophical method for examining human experiences is called phenomenology. This method is founded on the premise that human experiences is determined by the setting of where individuals live, therefore necessarily subjective (Qutoshi.,2018). Researchers that adhere to the concept of phenomenology concentrate on how each person interacts with their physical surroundings, things, other people, and the circumstances that affect how they behave. With this method, it is assumed that knowledge is derived through personal experience rather than from pre-existing theories (Saunders *et al.*, 2009). Because of this, the emphasis is on experiences and case studies are used, which feature open and unstructured interviews and inquiries. The research participants should share their personal experiences with a phenomenon that, in the right circumstances, might occur. The researcher needs to make sure that the respondents feel at ease sharing their stories while participating in the group. This strategy seeks to analyse data and draw conclusions about the relationships between the study variables based on empirical facts to aid in the interpretation of experiences (Qutoshi, 2018).

Positivism's epistemology holds that knowledge can be discovered using objective measurement, relying on scientific investigation based on data, facts, causality, and effects using the deductive approach. Once the knowledge is found, it can be generalized. Positivism's ontology holds that there is only one reality (Cohen *et al.*, 2007). Contrarily, constructivism's ontological orientation holds that there are several realities, and its position on knowledge is that it must be subjectively evaluated in order to ascertain the underlying significance utilizing an inductive approach. According to Saunders *et al.* (2009), everyone's perception of reality is different (Creswell, 2014).

Many different genres of literature view pragmatism as the ideal paradigm for carrying out mixed methods research focused on practice and 'what works'" (Creswell and Clark, 2011; Brierley, 2017; Tashakkori and Teddlie, 2008). In other words, pragmatism employs a variety of techniques, but the techniques should always be used in response to research problems. In order to achieve research objectives, it values both objective and subjective knowledge. Researchers who take a pragmatic stance are free to select the study techniques or approaches that will best address their research questions (Creswell, 2007). Additionally, it provides a logical foundation, methodological adaptability, and a comprehensive comprehension of smaller cases (Maxwell, 2016). To put it another way, the use of mixed-methods enables researchers to respond to study questions in a sufficient depth and breadth and aids in generalizing findings and implications of the studied topics to the entire population (Enosh, *et al.*, 2014).

### **1.7.2 Research design and approach**

The study adopted a convergent parallel mixed methods research design. In a convergent mixed method research parallel design, both qualitative and quantitative research are carried out concurrently such that the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently, after which interpretation of the results are carried out together (Creswell & Pablo-Clark, 2011). Unlike in exploratory sequential mixed methods research design, which sequentially carries out qualitative research which is followed up by quantitative research design, in convergent parallel design, both qualitative and quantitative research designs are carried out concurrently and independently. In this study, each specific the objective informed the independent focus of design to use. Objective one was an independent descriptive qualitative research paper while the subsequent objectives were carried out based on independent quantitative research adopting explanatory causal approaches. Both the quantitative and qualitative research tools were developed concurrently and independent of each other. Neither the qualitative results nor the quantitative results informed the development of the subsequent research tools. However, the qualitative data was collected first to identify the housing cooperative profiles as stratifying factors (groupings) of the housing cooperatives. The groupings were then used to inform the sampling techniques used in the quantitative research. The responses from the

qualitative research in objective one was also used to triangulate and compare to the results in the subsequent quantitative research carried out.

### **1.7.3 Description of the study area**

The study was carried out in the city county of Nairobi. According to Kenya National Bureau of Statistics (2020), Nairobi is the county with the biggest population and the highest percentage of individuals lacking adequate housing, with a population of 5,119,000. Second, Nairobi city county host the largest informal settlements in the country and neighboring countries for instance Kibera, Matare, Mukuru and dondara among others whose residents lack adequate housing (Emma and Kristine 2019). The State Department for Cooperatives, (2019) indicated that Nairobi city county has the highest number of housing co-operatives (115 out of 916, or 12.6% of total housing co-operatives) with a membership of 48,803 as of 31<sup>st</sup> December 2018. Nairobi city county has the highest number of housing providers such as housing cooperatives, non-governmental organization and real estate firms whose main goal is to provide housing to the market. As a result, there is a basis for gathering accurate and trustworthy information about housing co-operative finance sources and housing affordability.

### **1.7.4 Population and Sample**

The target population in this study consisted of members of housing co-operatives in Nairobi City County. The total of 115 housing cooperatives with a membership of 48,803 registered by the state department of cooperatives as at 31<sup>st</sup> December 2018 in Nairobi city county. The unit of analysis for the study are the housing cooperatives registered by state department of cooperatives in Nairobi city county. Based on multistage sampling, the study employed both non-probability and probability sampling techniques to select the housing co-operatives and members to participate in the study. The multistage sampling technique was adopted considering the multilevel structure of the population of members nested (grouped) in a housing co-operative. Some scholars have used multistage sampling method in conducting research include Joy and Kolb (2009). The first stage of multistage sampling was to draw 35 housing co-operatives to be considered in the study based on purposeful sampling. Criteria used to select 35 housing co-operatives out of 115 were based on compliance with the co-operative society act amended 2004, stating that every



registered co-operative must file annual returns. The study considered a five-year period (from 2012 to 2017) consecutive filing of returns.

The co-operative housing models were used as strata to group the housing co-operatives based on the model adopted. The priori paper carried out of profiling housing co-operatives models informed the stratification, which grouped the housing co-operatives into three models. Proportionate distribution of housing co-operatives adopting the ascertain model was used to determine the number of housing co-operatives selected from each model. The second stage of the sampling technique was to choose the 397 members from the 35 housing co-operatives selected in stage 1. The number of members per housing co-operative selected was based on the proportionate distribution with probability proportional to the size of co-operative (membership). Simple random sampling was then used to select the members to be included in the sample from the member's register of each housing co-operative. The sample size of 397 members was determined based on the sampling formula for a finite population given by;

$$n = N / (1 + (N \times e^2))$$

where

n is the sample size,

N is the population size and

e the permissible error of 0.05.

The calculation as follows:

$$n = 48,803 / (1 + (48,803 \times 0.05^2))$$

$$n = 48,803 / 123.0075$$

$$n = 397$$

This formula was given provided by Yamane (1967) as a simplified sample size computation for a finite population.

Selection of KIs was based on data saturation where sample size should be adequate to the point where there is no new concept to learn and concepts (themes) become redundant (Javadi and Zarea, 2016). In phenomenology, the sample size is increased in multiples of 10, 20, and 30 for as long as saturation is not reached after a small sample of 10 KIs has been collected and evaluated. The first batch of 10 Key informants were selected purposely from entire cooperative sector consisting of a

regulator, umbrella body, tertiaries and primary levels based on their experience, knowledge, expertise and position they held in their respective organizations. It was found that this batch reached saturation point and there was no need to select another batch of 10KIs they include, Deputy commissioner for state department of cooperatives, the chairman of National Cooperative Housing Union (NACHU), the Project manager of Urithi housing cooperative, the chairman of Kenhut housing cooperative, the general manager of Nairobi Teachers housing cooperative, the Treasurer of Shirika housing cooperative, the general manager of Chai Investment Cooperative, the general manager of Tai housing cooperative, the chairman of Bingwa housing cooperative, and the general manager of NACICO Housing cooperative were the key informants selected for the study as shown in Table 1.2.

**Table 1. 2 : Sample Frame of Key Informants**

	<b>Institutions</b>	<b>Levels</b>	<b>Titles /Position</b>	<b>Duties and Responsibilities</b>	<b>Total Number</b>
1	State Department of Cooperative	Regulator	Deputy Commissioner of State Department of Cooperatives	Oversee the cooperative housing projects, in charge of regulating and monitoring housing cooperatives, advisory services to housing coops members etc.	1
2	National Co-operative Housing Union	Umbrella body	Chairman	promote the coop housing model, assist in formation, training and preparation of primary housing coops etc.	1
3	Shirika Housing Cooperative	Tertiary	Treasurer	assist in financial management, budgeting, housing coop investment, fundraising, signatories to the bank etc.	1
4	Urithi Housing Cooperatives	Tertiary	Project Manager	In charge of the housing projects, planning and budgeting, mobilization of resources etc.	1
5	Kenhut Housing Cooperative	Primary	Chairman	in charge of management committee, signatories for the bank operations, preside over all the meeting,	1
6	Nairobi Teachers Housing Co-operatives	Tertiary	General Manager	day to day operation, coordination of all housing projects, carry out policies and procedures, secretary of board etc.	1
7	Chai Investment Cooperative	Primary	General Manager	day to day operation, coordination of all housing projects, carry out policies and procedures, secretary of board etc.	1
8	Tai Housing Cooperative	Primary	General Manager	day to day operation, coordination of all housing projects, carry out policies and procedures, secretary of board etc.	1
9	Bingwa Housing Cooperative	Primary	General Manager	day to day operation, coordination of all housing projects, carry out policies and procedures, secretary of board etc.	1
10	NACICO Housing Cooperative	Tertiary	General Manager	day to day operation, coordination of all housing projects, carry out policies and procedures, secretary of board etc.	1
	<b>Total</b>				<b>10</b>

### 1.7.5 Data collection methods

The study used both quantitative and qualitative data collection techniques. Quantitative data were collected using a survey structured questionnaire administered to the members of housing co-operatives. Primary data was collected using survey

questionnaires consisting of closed –ended questions to the 397 members who responded to both independent variables (member participation, cooperative housing finance and supportive environment) and dependent variable (housing affordability). The reason why the questionnaire was used in this study is because of its effectiveness in collecting data from a very large sample and can do so at a low cost while also covering a larger geographic area, allowing respondents freedom and privacy, enhancing confidentiality, and removing the interviewer's bias (Krishnaswami and Ranganatham, 2005).

Semi structured interview guide schedule was used to collect qualitative data through Key Informants interviews. A total of 10 key informants were chosen for the study based on their experience, knowledge, expertise and the position they held in their respective organizations. The interview guide consisted questions covering all the objectives of the study including profiling of housing cooperative model, member participation, supportive environment and cooperative housing finance. It was convenient and appropriate for both the researcher and the KIs to used one interview guide schedule with all the questions saving time and cost effective.

Data for the study were collected from August 16, 2018 to December 20th, 2018. All the interviews were conducted face to face and transcribed verbatim. Field notes and electronic audio recorders were used to collect qualitative data, which was then typed into Atlas software, categorized, coded, and organized into themes for analysis. The secondary data collected from the housing cooperatives includes a list of audited financial statements of housing cooperatives, a loan schedule, a minute of the meetings held by various housing cooperatives, bylaws, title deeds, membership register and asset register book.

## **1.7.6 Reliability and validity**

### **1.7.6.1 Reliability**

Reliability describes how effectively the findings can be replicated when another researcher replicates the data collection and analysis procedures (Csikszentmihalyi and Larson, 2014). Reliability was checked by assessing the internal consistency of the constructs as measured by the indicators using Cronbach's alpha. The internal consistency threshold was set at to the acceptable standard of chronbach alpha above 0.7 (Sekaran,2010). A pilot test was done on a sample size of 30 respondents from

Kiambu county which was not part of the study area as recommended by Saturno-Hernandez *et al.* (2019). All the constructs had alpha values greater than 0.7 implying adequate reliability.

#### **1.7.6.2 Validity**

Validity refers to the extent to which the measures used in a questionnaire are truthfully measuring the intended concepts and not something else (Yoshida, *et al.*, 2017). A pilot study was conducted to determine the validity of research instruments before main data collection exercise. Proofreading and editing of the questionnaires and interview guide was done by the team of experts from housing cooperative sector and academia who then gave comments for improvement of the instruments for their validity. The internal validity was further ensured by limiting and removing additional variables that can affect the dependent variable. The study made sure that the measurement tools had content validity (the indicators used to assess each variable) and discriminant validity (each variable is independent of the others in terms of how it influences the dependent variable) (Creswell, 2014). By verifying that the equipment had all necessary components and that the outcomes of each measurement were consistent with one another, this was achieved. A number of academics who were authorities in the field were consulted in order to guarantee the face validity of the study's objectives.

#### **1.7.7 Data analysis**

In this study, For the first objective (profiling housing cooperative models to address the shortage of affordable housing) used thematic content analysis because the data was qualitative in nature. Thematic content analysis, according to Braun and Clarke (2006), focuses primarily on locating patterns or themes within qualitative data, which the study saw as the profiling of housing co-operative models. The following steps were followed based on the Braun and Clarke, (2006) approach for thematic content analysis: familiarization with the data, creation of initial codes, search for themes, review of themes, definition of themes, and write-up.

The second objective (housing cooperative member participation on housing affordability) was measured by the 13 retained indicators which sought to determine the level of member participation in relation to their housing co-operative. The indicators were grouped into four dimensions, then reduced to one overall member

participation index. To reduce the dimensions of member participation into a single composite measure, a weighted index was used where the participation index of each indicator for the sample was deduced and used as the weights. Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). The models fitted were used to test the study hypothesis developed for the assumptions of normality and heteroscedasticity were tested.

The third objective (the influence of supportive environment on housing affordability) used factor analysis for dimension reduction of the independent variable (supportive environment) into three sub dimensions (legislative and policy, collaboration and partnership and support services). Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). In the study, the fixed effect component represents the “within” group effects due to the level 1 elements (housing cooperative members) nested in the level 2 (housing co-operatives) such that the between group effects represented by the random effects.

The fourth objective, (the influence of cooperative housing finance on housing affordability) used factor analysis for dimension reduction (Member savings, cooperative loans, government loans and bank loans). of the independent variable (cooperative housing finance) into four sub dimensions. Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). In the study, the fixed effect component represents the “within” group effects due to the level 1 elements (housing cooperative members) nested in the level 2 (housing co-operatives) such that the between group effects represented by the random effects.

For the three objectives, the interest is to assess the significant influences of member participation, cooperative housing finance and supportive environment on extension of affordable housing (level-1) in the housing cooperatives (level-2). Variation in housing affordability and the independent variable is expected at both level 1 (fixed effects) and level-2 (random effects) as each member responded based on their view of affordability of housing in their housing cooperatives as designed in the data collection tool. The random-intercept model with only one fixed effect predictor at the member level would be specified at level 1 and level 2 in hierarchical form

separately. The consideration for using REML is due to the unbalanced multilevel structure of the data. The data is considered unbalanced as the number of level-1 within the level-2 units are unbalanced as the housing cooperatives each have varying number of members. Maximum Likelihood techniques could consider either Full Maximum Likelihood (FML) or alternatively the Restricted Maximum Likelihood (REML) estimation techniques due to advantages such as flexibility to handle unbalanced multilevel data. Both techniques generate equivalent fixed estimates but the REML estimations are less biased in comparison to FML (Albright and Marinova, 2010). A study by Otieno (2015) applied REML in assessing the performance of pupils through Kenya Certificate Primary Examinations. While Linck and Cunnings (2015); and Van dongen (2004) applied REML in conducting their studies.

### **1.8 Ethical Considerations**

Numerous scientists emphasize the significance of ethical considerations while undertaking research. First and foremost, the researcher must respect the rights, needs, values, and preferences of the participants (Creswell 2014). The researcher observed ethical consideration as stipulated in various research federations. A clearance letter for data collection was issued by the University allowing the researcher to collect data within time stipulated in the letter. Second, a research permit was issued by National Commission for Science, Technology and Innovation (NACOSTI) to allow the researcher to collect data from housing cooperatives located in Nairobi City County. For Key Informant Interviews, letters of request were sent to various housing cooperative organisations for approvals prior to interview dates. The researcher assistants were provided with the requisite information, documents and training relevant to data collection processes. The researcher introduced himself to the participants before starting collecting data from time to time. Brief introduction of researcher, research goals, and how the information will be used. To protect the participants' privacy and safety, the verbatim transcriptions and written interpretations were both anonymised.

### **1.9 Organisation of the Thesis**

This thesis is organised in six chapters excluding preliminaries and appendices pages. The preliminary pages comprise the title page, declaration, copyright, certification, dedication, acknowledgements, table of contents, list of tables, list of figures, abbreviations and acronyms and extended abstract. Chapter one consists of the

background to the study, problem statement, research objectives, justification, theories, conceptual framework, methodology and ethical issues. The chapter two, three, four and five comprise of published and publishable manuscripts. The manuscripts format appears as per the requirements of the specific proposed journal. Chapter six addresses summary of findings, conclusions and recommendations.



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## CHAPTER TWO

### 2.0 Profiling Housing Co-operative Models in Addressing Shortage of Affordable Housing in Nairobi City County, Kenya

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#### 2.1 Abstract

Housing is fundamental rights to every human being and every person is entitled to this basic need. However, the biggest challenge facing Kenyan is lack of affordable housing especially for low- and middle-income households residing in urban areas. The lack of affordable housing has prompted the researcher to investigate housing cooperative models and their appropriateness in addressing shortage of affordable housing in Nairobi City County. The paper's specific objectives are to profile various housing cooperative models used by housing cooperatives in Nairobi City County and assess the appropriateness of the housing cooperative models in provision of affordable housing. Exploratory research approach was adopted in this paper to search for scarcity information relating to housing cooperative models. A qualitative approach driven by semi-structured interviews was adopted in obtaining information relating to how the housing co-operative models formed, membership characteristics, management practices, financing models and ownership practices. The purposive sampling technique was used to select 10 Key informant from 35 active housing co-operatives in Nairobi City County. Thematic content analysis was used to analyze qualitative data obtained through Key Informants Interviews. Findings revealed that limited housing cooperative model is the most commonly used among the members of a housing cooperative in Nairobi City County. In addition, the finding show that the model was suitable in addressing financial issues for low- and middle-income households who were excluded from accessing housing finance from financial institutions. In conclusion, limited housing cooperative model was the most preferred model among the resident of Nairobi City County. However, the model failed to take into consideration collective efforts of members in terms of collective housing construction which bring down the total cost of construction. The paper recommends restructuring of housing finance system to take into consideration issues of low- and middle-income households for adoption of multiple mortgage housing cooperative model. Also, the paper recommends ministry of finance to give special consideration to housing cooperatives in terms of accessing housing finance from financial institutions. Furthermore, the paper recommends state department of cooperatives to regularly conduct the baseline survey to ascertain the status of housing cooperatives in terms of management of housing cooperatives, land ownerships, number of housing units produced and financed by housing cooperatives.

**Keywords: Profiling, Housing Co-operatives, Models**



## 2.2 Introduction

Housing should be viewed as a basic human need and not as commodity for speculation for profit in open market (Marcuse, 2020). According to Maslow's Hierarchy of Needs shelter or housing is rated in the first tier of needs which is a five-tier model of human needs (Ikpeme *et al.*, 2016). However, many people cross the global lack this important basic need. World Cities Report (2020) projected that more than 1.6 billion people, or 20% of the world's population live in life-threatening structures accelerated by rapid urbanization, rural to urban migration, high rate of poverty, and social economic disparity among the people. A study by Alteneiji *et al.*, (2019) argue that many governments worldwide are committed to finding a long-term solution for affordable housing which is affecting the societal development. Malatest and Associates (2018) argued that one way of proving affordable housing to low- and middle-income household is through housing cooperative model.

The housing cooperative approach has been recognized globally as an appropriate way to bring together people from different background with a shared vision to realize their housing needs (Sørvoll and Bengtsson, 2020). Centre for Affordable Housing Finance (2017) posit that housing cooperative is a legal association formed for the purpose of providing housing to its members on a continuing basis. A study by Ganapati (2010) postulate that housing cooperative is an alternative housing model that provides a foundation for community building and shared responsibility through innovative housing design and inclusive resident governance structures. In addition, housing cooperative delivered 17% of the total housing stock in Sweden, 50% in Norway, and 75% in Poland (International Co-operative Alliance, 2012). This housing is considered important, particularly in retaining long-term affordability in the face of gentrification.

There are different housing cooperative models adopted by different countries across the globe, but what makes them common is that they are jointly owned and democratically controlled by their members and they upheld the cooperative principle and value that they believe in (International Co-operative Alliance, 2012). Malatest and Associates (2018) found that the rental co-operative model adopted in Austria, Canada, and the UK, reported increased security of tenure, high quality of housing, and affordability. Similarly, in Austria, Denmark, France, Switzerland, Uruguay, and the USA, adopted limited equity co-operative model and reported lower cost, high

quality of homes with better security of tenure, and lower equity risks (Crabtree *et al.*, 2019). In addition, the residents in the market equity cooperative model adopted in Norway and the USA demonstrated greater satisfaction about management quality, building quality, building security, and low crime rates (LaPalme, 2018). However, in Germany, Australia, Canada, the predominant model is a non-equity cooperative model. The main purpose of their chosen model was to provide services to members unlike financial gain (Malatest and Associates, 2018).

In Africa, despite the fact that housing co-operative is still in its infancy as a method of providing affordable housing, there are a number of housing cooperative models adopted by various countries. For instance, In Nigeria, housing cooperatives adopted restricted housing co-operative model, multiple mortgage housing co-operative model and continuous housing co-operative model (Azeez and Mogaji 2017). In South Africa, according to Ganapati, (2014); Jimoh, and van Wyk, (2012) and Anonymous (2005) development housing co-operative model and continuous co-operative model are commonly used. While in Tanzania, Limited objective cooperative and mutual ownership model were adopted (Nguluma, 2016).

As housing costs in Kenya's Nairobi capital city continue to rise to exorbitant levels, housing cooperative approach may be a realistic and financially sound solution for people and families with low- to moderate-income households (World bank,2017). With an expected yearly demand of 200,000 units and an estimated annual supply of 50,000 units, the housing backlog in Kenya has reportedly reached two million units (World Bank, 2018). Kenya's government launched a number of initiatives to solve the housing shortage. These strategies included establishing the National Housing Development Fund (NHDF), the Kenya Mortgage Refinancing Company (KMRC), slum upgrading, public-private partnership cooperation, and social housing. Still the progress is not impressive to cater for huge housing deficit.

According to Githira, (2016), state has evicted people to allow for infrastructure expansion, but there is no resettlement strategy, no tenure security, and a lack of significant policy support for poor housing expansion. According international institute for environment and development, high-rise informal dwelling types that violate planning and building codes coexist in Nairobi city county. Approximately 70% of Nairobi residents live in single-room apartments in informal settlements and tenements as the city transitions from low-density shacks to multi-story tenements

(IIED, 2019). The government's current housing strategies for the poor appear to have failed in terms of reaching the poor, meeting the level of affordability, and housing volume in relation to demand due to a number of factors, including a lack of recipient involvement, a lack of funds, and actor coordination and communication (World Bank, 2017). This calls for a fresh approach that may address the issues with top-down policies that are now plaguing the system.

Ochieng *et al.*, (2017) argue that housing has never been a priority for most developing nation, Kenya included. This means that even compiling data for this sector is not a priority for decision makers at national and county level. A member needs sufficient knowledge to make the best decision, yet the data available about cooperatives is, at best, subpar (Brown *et al.*, 2015). Rarely are thorough endeavors made to compile substantial amounts of reliable, cogent, and comparative data (Galhardi, 2016). Although there is rich information related to housing sector, there is lack of co-ordination between different sources meaning that policies developed do not take into account the reality in the ground.

This research is paramount bearing in mind that housing profile is the first step in addressing unique challenges facing housing sector in Kenya. As noted by (Ganapati, 2014) there is a need for housing co-operative to explore various models and practices that exist, their role and opportunities towards achieving affordable housing. Indeed, several authors have call for exploration of dilemma involved in housing co-operative sector in provision of affordable housing and particularly the tension surrounding housing co-operative models and practices (Ganapati, 2014; Czischke 2018; Malatest and Associates 2018).

There has been very little research on these topics in housing cooperatives in Kenya. For instance, UN-Habitat, (2010) conducted study on organization, management and finance of housing cooperatives in Kenya and found that housing cooperative are able provide sustainable and affordable housing to the informal settlers. Kieti *et al.*, 2020; Mwau *et al.*, 2019; Gardner *et al.* 2019; Petrus and Newman, 2019; Mose *et al.*, 2018 observed that affordable housing has affected a number of factors such as inefficient system of land registration, unaffordable finance, limited supply developable land, speculation of prices of land, lack of physical and social infrastructure and inappropriate policy and regulation. Other studies including Onchieku and Ragui (2019) investigated the importance of strategic leadership on performance of housing

co-operative societies in Nairobi City County. While we appreciate the literature on international studies that would provide a greater understanding of the models and methods used by many nations throughout the world, the "best" housing cooperative models may not be replicated to another country because of legal, social-economic, political, cultural differences that may not be compactable to another country.

In light of this, the study aimed to investigate a more thorough and critical analysis of housing cooperative models using Kenyan context in the following thematic areas: the formation of housing cooperative, ownership of housing cooperative, financing of housing cooperatives and management of housing cooperative. The ultimate goal of profiling housing cooperative model was to answer the following questions; what is the most commonly used model in Nairobi City County, Kenya? What distinguishes each model? Which model is best suited to provide Kenya with affordable housing? Only by profiling housing cooperative models can these questions be answered. In order to improve the housing cooperative industry in Nairobi City County, the study aimed to profile housing cooperative models because doing so would produce knowledge, data, and analysis needed to make informed policy decisions.

### **2.3 Guiding theory**

The concepts of transaction cost economics are used to explain the strategies organizations take to develop strategic partnerships in order to improve organizational performance. Therefore, the fundamental idea of transaction costs is to ensure that there is flow and sufficient information that inform decision making. Transaction cost theory was coined by Williamson in 1975 who defined transaction costs (TC) as expenses caused by internal business operations of firms. In this respect, transaction costs vary from one firm to another based on efficiency and maybe economies of scale (Wiesner, 2017). This idea guides businesses organization to seek for strategic partners to avoid losses. The foundation of transaction cost theory is the notion that one can outsource while still maintaining a competitive advantage, for instance by consistently exceeding customer expectations. The trade-off in TC is between control and cost-sharing factors (Bahli and Rivard, 2017).

The transaction cost theory has been co-opted to housing cooperative to demonstrate how the perfect flow of information can reduce the transaction cost. The aim of

profiling housing cooperative models is to ensure that there is abundant information available for members of cooperatives as well as government agent and policy makers in order to base their decision on data. The cooperative housing is financed by different sources from different institution; therefore, it is in order obtaining accurate and complete information about the nature of operations in housing cooperative.

The significance of the transaction cost theory to the study is in three ways. The idea first points out that regular encounters between housing cooperative might result in the creation of strategic alliances that permit returns and risk sharing. Second, the housing cooperative may form alliance or joint ventures who share similar economic objectives, such as maximizing returns and cutting costs and sufficient information is needed. Lastly, according to the second view, joint ventures may result in the creation of new organizations that are not independent of the original organizations. Therefore, housing cooperative are involved in extensive housing activities that can be expensive and complicated, necessitating a sufficient flow of information from one entity to another.

#### **2.4 Methodology**

The exploratory research designs were used in this study. When there is insufficient information regarding a phenomenon or a problem that has not been precisely identified, exploratory research is conducted (Saunders *et al.*, 2009). Key informant interviews are used in exploratory research to help define problems more accurately, clarify concepts, obtain justifications, gain insight, discard unworkable ideas, and develop hypotheses. Exploratory investigations use a wide range of approaches and techniques, including document analysis, qualitative analysis, and quantitative analysis.

The goal of the study was to provide a detailed description of each housing cooperative model's characteristics without evaluating causal relationships or using an experimental control. The study's design, which focused on a qualitative approach based on key informant interviews and document analysis, was used to explore and profile the housing cooperative models in terms of their characteristics in order to answer the research question of the study. Thematic analysis a qualitative analysis technique was used to analyze housing cooperative models (Mason, 2002). According to Sue and Ritter (2012), exploratory studies do not try to look at a

representative sample of the population, instead, they typically look for people who are knowledgeable about a subject matter. In the same vein, Patton (2002) suggested employing purposive sampling approaches for selecting key informants, who were based on technical expertise, knowledge and position they held in the co-operative sector for the selection of Key informants in this exploratory study.

According to the idea of data saturation, which was previously recommended for thematic content analysis by Javadi and Zarea (2016), the sample size should be adequate to the point where there is no new concept to learn and concepts (themes) become redundant. In phenomenology, the sample size is increased in multiples of 10, 20, and 30 for as long as saturation is not reached after a small sample of 10 KIs has been collected and evaluated. Given the objectives of this paper necessitated the use of exploratory research design approach which emphasized on sampling technique on in-depth analysis of information through exploration study (Patton, 2002).

A total of 10 Key informants were selected based their experience, knowledge, expertise and position they held in their respective organizations. Deputy commissioner for state department of cooperatives, the chairman of National Cooperative Housing Union (NACHU), the Project manager of Urithi housing cooperative, the chairman of Kenhut housing cooperative, the general manager of Nairobi Teachers housing cooperative, the Treasurer of Shirika housing cooperative, the general manager of Chai Investment Cooperative, the general manager of Tai housing cooperative, the chairman of Bingwa housing cooperative, and the general manager of NACICO Housing cooperative were the key informants selected for the study. The criterion used for selection key informant was based on zoning of housing cooperative in Nairobi City County.

Each interview lasted roughly an hour and took place at their respective offices. The interviews were taped using electronic audio equipment. The audio files were then converted into text for examination by transcription of the recorded audio files. The qualitative transcribed text data were coded, and coded data were extracted using Atlas software. The interviews were conducted from August 16 through August 30, 2018. All the interviews were conducted face to face and transcribed verbatim.

Document analysis was done in addition to the main data from the key informant interviews.

The purpose of document analysis was to further explore the housing cooperative profiles and utilize key informant interview data to supplement it. Selected housing cooperative documents, such as the member passbook, title deed or certificate of lease, and service charge register, served as the primary sources of data for document analysis. The topic categories that focused on the profile of the various housing cooperatives models, such as cooperative formation, funding, ownership, and management aspects.

In this study, thematic content analysis was used because the data was qualitative in nature. Thematic content analysis, according to Braun and Clarke (2006), focuses primarily on locating patterns or themes within qualitative data, which the study saw as the profiling of housing co-operative models. The following steps were followed based on the Braun and Clarke (2006) approach for thematic content analysis: familiarization with the data, creation of initial codes, search for themes, review of themes, definition of themes, and write-up.

As interviews were conducted, they were recorded using electronic audio devices. The recorded audio files were then transcribed to convert the audio files into text for analysis. Javadi and Zarea (2016) note this as one of the most significant stages for interpreting qualitative studies such that the speeches should be transcribed correctly including spellings of each word and punctuations. Even the placement of a comma could alter the meaning of a concept being assessed. The transcripts from the audio files which are readily available were read repetitively for the familiarity of the data. Through the repetitive reading of the transcripts, patterns of the concepts gradually emerged.

Here, based on the organization of data systematically and meaningfully, initial codes were generated. Rather than considering only the semantic themes for initial code generation, the study based this stage on latent themes and semantic themes where new information is revealed. The semantic approach is explicit such that the researcher does not go to interpretations beyond the responses from the participant while the approach of the latent theme is interpretative enabling the study to detect beliefs, presumptions, and expectations. The detected patterns of initial codes could

be based on theories from empirical information. This study based the latent themes approach on detection of concepts based on empirical studies. On familiarization with the data, it was noted that the responses come across all the Key informants from different institutions. Initial codes were generated for each question based on the concept patterns detected.

The initial coding on the question of the primary objective of establishing the housing cooperatives the study generated codes considering the empirical objectives of housing co-operatives which is to assist in the provision of housing facilities for members. The responses from the state department of cooperative and development, NACHU, Bingwa housing cooperative, Tai housing cooperative and NACICCO housing cooperative officials gave guidance on expectations of the objectives of primary housing co-operatives as land acquisition, housing acquisition and/ or financial assistance. Considering the data clustering of these objectives from the responses the objectives were coded as; Financial assistance, Land acquisition, and Housing acquisition

The question of housing co-operative membership was concerned with how the housing co-operatives conduct their membership by exploring the membership eligibility. The initial coding was also based on latent themes from empirical studies appearing in the data and expectations according to the state department of cooperative and development, Nairobi Teachers housing cooperative, Kenhut housing cooperative and Shirika housing cooperative officials. The expected concepts of membership were open or closed and that of restriction or non-restriction. The same concepts were found recurring in the data without any new information not reflected in empirical studies. The following initial codes were therefore generated; open, restricted, not restricted and closed membership

Concerning the governance of housing co-operative, the initial code generation from the data was also based on latent themes from empirical studies and information from the umbrella body of primary housing cooperative (NACHU), Shirika housing cooperative, NACICCO housing cooperative, Urithi housing cooperative and Chai investment cooperative officials on expected structures of primary housing cooperatives. This was based on what is considered as the ideal governance practices of housing co-operatives. The latent theme codes generated from the data were the



existence of concepts of; AGM, ADM, Elected BOD, Maximum number and meetings of the BOD per year, Management committee and staff and audited financial statements

On the ownership model adopted by the housing co-operative, the study sought to describe the profile of the ownership model adopted by housing cooperatives in Kenya. The latent themes for this question based on empirical ownership models and expected models from the NACHU, Tai housing cooperative, Bingwa housing cooperative, Kenhut housing cooperative and Nairobi teachers housing cooperatives official's responses were, Limited housing co-operative, Multiple mortgage co-operative and incremental or short loan model. However, the data presented another possible model where the co-operative has no individual member ownership. The initial codes generated for this question were, therefore; Limited housing co-operative, Multiple mortgage co-operative, incremental or short loan model and No individual member ownership

Concerning the financing model of the housing co-operatives. The study adopted semantic themes to generate initial codes. A variety of varying financial model concepts was revealed to cut across the housing cooperatives. Here Empirical studies and the response from Shirika housing cooperative, NACHU, NACICCO housing cooperative, and Urithi housing cooperative officials identified codes for every new financial concept revealed until saturation was achieved. The financial model concept initial codes were; Members savings, Loans, Capital subsidy, and grants, Also, assessed was the question concerning the importance of co-operative principles of the housing co-operative. Here Empirical studies and the response from Urithi housing cooperative, Kenhut housing cooperative and Nairobi Teachers housing cooperative officials, were key in latent theme generation of codes. The Latent themes expected and found to recur in the data were; Voluntary and open membership, democratic member control, economic participation by members, Autonomy and independence, Education, training and information co-operation among cooperatives and Concern for community. These concepts formed the initial codes.

On the question concerning service delivery of the housing co-operative, the study sought to determine how the housing co-operatives offer services. Here Empirical studies and the response from Chai investment cooperative, Bingwa housing

cooperative, and Tai housing cooperative officials were key in latent themes were created for service delivery which were used to as the initial codes from the data; Land processing and titling, constructions services, financial services, member education, and training services and Saving scheme facility

**Table 2. 1 : Initial codes generated**

<b>Initial codes generated</b>	
Respondent is an Deputy commissioner	Uses continuous housing co-operative model
Respondent is a Co-operative Chairperson, project manager and chairman of umbrella body	Adopts a no individual member ownership model
Respondent is a Co-operative manager, Treasurer	Adopts 100% Members savings
Objective of formation was financial assistance	Adopts<100% Member savings
Objective of formation was Land acquisition objective of formation was Housing acquisition	Gives Loans-Sacco loan, cooperative loan, bank loan and government loan
Objective of membership based on shares capital	Uses Capital subsidy
Cooperative has Open membership	Receives Donations and grants
Cooperative has Restricted membership	Uses Incremental housing model
Cooperative has Not restricted membership	Uses Self-help housing coop model
Cooperative has Closed membership	Uses No specified housing model
Cooperative Holds AGM	Adopts Equitable distribution of resources
Cooperative Holds ADM	Adopts Property management
Cooperative Elects BOD	Encourages Monthly contributions
Cooperative has a maximum number of meetings by BOD	Encourage Economic participation
Cooperative has a management committee and staff	Encourage member obligations
Cooperative publish audited financial statements	Good governance practice
Uses Limited housing co-operative model	Gives services to members only
Uses multiple mortgage co-operative model	Offer services to both members and non-members

The themes were then sought from the codes. Here, the list of codes is organized to form themes. Some could form themes while others could form sub-themes such that they are reorganized collectively to form specific themes (concepts). Javadi and Zarea (2016) advise that in this stage, one should consider, if possible, how different codes can be combined to form an overarching theme. In this study, codes generated from most questions formed themes themselves. However, the codes from the question on the primary objective of establishing the housing cooperatives were re-organized considering the overlap due to the possibility of a cooperative taking more than one of the objectives. The following themes were created from the initial codes.; Financial assistance only, Land acquisition only, Land acquisition and Housing and Land acquisition, Housing, and financial assistance.

Another set of initial codes that were re-organized due to overlap to form themes were the codes based on the question of housing co-operative membership. The themes created from the initial codes were as follows; share capital contribution, monthly savings contribution, open and not restricted, open but restricted, closed but not restricted, and closed and restricted.

The themes generated from the initial codes were reviewed considering the membership ownership of internal homogeneity and external heterogeneity. Review considering the ownership of cooperative housing sought to ensure that the data within the themes are meaningfully related to each other while the different themes are explicitly differentiable. At this stage, some themes may be merged with other themes or they may create new themes in combination with other themes due to having homogeneity or common roots (Javadi&Zarea, 2016).

**Table 2. 2 : The themes generated from the initial codes**

<b>Theme: Designation of respondent</b>	<b>Theme: Objective of cooperative establishment</b>	<b>Theme: Membership</b>
<u>Codes:</u> Officer Co-operative Chairperson Co-operative manager  Financial assistance	<u>Codes:</u> Financial assistance only Land acquisition only, Land acquisition and Housing Land acquisition, Housing and financial assistance.	<u>Codes:</u> Open and not restricted Open but restricted, Closed but not restricted,  Closed and restricted
<b>Theme: Governance</b>	<b>Theme: Co-operative financing</b>	<b>Theme: Member financing</b>
<u>Codes:</u> Hold AGM Hold ADM  Elected BOD Maximum number of meetings by BOD Management committee and staff Audited financial statements	<u>Codes:</u> 100% Members savings <100% Member savings  Loans Capital subsidy  Donations and grants	<u>Codes:</u> Incremental housing model Self-help housing coop model No specified housing model
<b>Theme: Principles</b>	<b>Theme: Services</b>	
<u>Codes:</u> Equitable distribution of resources Democracy  Training and volunteering Economic participation Autonomy and independence Concern for the community	<u>Codes:</u> Members only services  Services offered to both members and non-members	

However, at the reviewing stage, all the themes from the initial codes from all the questions remained unaltered, a final refinement of the themes was carried out to identify the ‘essence’ of what the themes were about (Braun & Clarke, 2006). A relationship among all the themes across all questions was sought and it was noted that all the themes could be classified into two major categories; as housing co-operative practices and housing co-operative models.

**Table 2. 3 : Reviewed themes**

<b>Theme: Designation of Key Informants</b>	<b>Theme: Objective of cooperative establishment</b>	<b>Theme: Membership formation</b>
<u>Codes:</u> Deputy commissioner Co-operative Chairpersons Co-operative managers Project Manager Treasurer Chairperson of umbrella body	<u>Codes:</u> Financial assistance Land acquisition Housing acquisition	<u>Codes:</u> Shares capital Monthly Savings Open Closed
<b>Theme: Membership ownership</b>	<b>Theme: maintenance and repairs</b>	<b>Theme: governance</b>
<u>Codes:</u> Collective ownership Individual ownership	<u>Codes:</u> Members fence their plot themselves Cooperative fence and subdivide the land into plots Collective maintenance and repairs Hired firm to maintain the estate	<u>Codes:</u> Elected BOD Maximum number of meetings by BOD Voting in AGM
<b>Theme: Management</b>	<b>Theme: % of member savings</b>	<b>Theme: Sources of finance for cooperative</b>
<u>Codes:</u> Management committee and staff Obligation and responsibility of members Audited financial statements	<u>Codes:</u> 100% Members savings  <100% Member savings	<u>Codes:</u> Member savings Loans-co-op loans, banks loans and government loan  Capital subsidy Donations and grants
<b>Theme: Member financing</b>	<b>Theme: Property management</b>	<b>Theme: monthly costs</b>
<u>Codes:</u> Housing cooperative models Incremental housing model Self-help housing coop model	<u>Codes:</u> Members management Outsourcing the services Committee formed in charge	<u>Codes:</u> Service chart charge Services Services offered to members Amount of money paid monthly

After the themes were reviewed and well defined, a write-up of the results was written. The results involved writing a summary of the results in terms of the occurrences of each theme. The write-up was organized in the results section based on the questions asked. The themes in some questions were mutually exclusive and thus formed categorical scale measurements and were summarized while others that were not mutually exclusive were based on the number of occurrences.

The appropriateness and suitability of the housing cooperative models were analyzed using Strength, Weaken, Opportunity and Treats (SWOT) on the data collected from housing cooperatives in addition to the exploration that showed the characteristic description of the model profiles. By examining and reporting factors that encourage

the acceptance of the models as well as factors that inhibit the adoption of the models. The SWOT analysis served as the foundation of determining the appropriateness of the models.

## **2.5 Findings and Discussion**

### **2.5.1 Profiling housing co-operative models**

The objective of this paper was to present an in-depth qualitative analysis of housing co-operative models. The profiling was based on exploratory key informant interviews conducted to define the profiles of the various housing models based on the formation, ownership, finance, monthly costs, maintenance and repairs, membership formation and property management as guided by the literature. Key informant interviews served as the primary source of data for this exploratory study supplemented by document analysis. The exploration was carried out according to the prescribed steps, starting with the initial code generation and ending with the classification and review of the themes found using both latent themes and semantic themes, where original information was revealed.

The result identified three housing cooperative models practiced in Nairobi city county namely; Limited Housing Co-operative Model (LHCM), Multiple Mortgage Housing Co-operative Model (MMHCM), and Continuing Housing Co-operative Model (CHCM). The profiling was able to define and explain the models as well as investigate the motivations behind housing cooperatives' adoption of the models. The investigation reveals that some similarities and differences among the models identified as show in the Table 2.4.

### 2.5.2 Differences and similarities among the housing cooperative models

**Table 2. 4 : Differences and similarities among the housing cooperative models**

	Limited housing coop model	Multiple mortgage coop model	Continuing coop model
<b>Formation</b>	<p>Members formed the housing cooperative for the purpose of acquiring land for housing development.</p> <p>Once the objective of forming housing cooperative is achieved the cooperative is dissolved.</p> <p>The housing cooperatives is involved in land buying business for their members</p>	<p>Members formed the housing for the purpose of acquiring affordable housing</p> <p>The objective of forming housing cooperative is provision of housing in continuous bases</p> <p>The housing cooperative main objective is to provide housing in continuously bases to current and incoming members</p>	<p>Members formed the housing cooperative for the purpose of serving members and non-members</p> <p>The objective of forming the housing cooperative is to provide more additional income to the founding members</p> <p>The housing cooperative has closed membership and their major objective is to make addition revenue to their members through rent.</p>
<b>Ownership</b>	<p>Members obtain title for their land and building directly from the housing cooperative.</p> <p>Each member has the exclusive right to own a piece of plot according to their shares</p> <p>Each member has exclusive right to title deed of his or her plot</p> <p>The corporation does not own any land however land is owned by individual members</p>	<p>Members are the sole owners of land and buildings.</p> <p>The housing cooperatives owns common facilities.</p> <p>Each member has the exclusive right to occupy a particular dwelling unit in perpetuity.</p> <p>Each member is entitle to title deed plot or unit.</p>	<p>The housing units or apartment is owned collectively by the housing cooperative members.</p> <p>Each member has exclusive right to occupy particular housing unit based on his or her shares</p> <p>The housing units or apartment can be used by non-members at market rates</p> <p>The housing cooperatives owns collectively land, building and common facilities</p>
<b>Financing</b>	<p>Members finance their housing unit/plot through their personal savings, relatives and friends</p> <p>Members are not obligated to make monthly carrying charge payments to the cooperative.</p> <p>Members with share loans (if any) are personally liable to their share lenders for the amount of the loan.</p>	<p>Members have personal liability on cooperative's blanket loan.</p> <p>Members are obligated under occupancy agreements to make monthly carrying charge payments to the cooperative.</p> <p>Housing cooperative borrow funds from cooperative bank, KUSCCO, SACCOS and NACHU</p> <p>Members with share loans (if any) are personally liable to their share lenders for the amount of the loan.</p>	<p>The members have personal liability on cooperative's blanket loan.</p> <p>The loans and other liabilities are financed by monthly revenue collected through rent</p> <p>The housing cooperative can also be financed from cooperative bank and NACHU, SACCOS and KUSCCO</p> <p>Member residents are obligated under their leases to pay monthly rent to the end of the lease term</p>

Monthly Costs	Each member pays monthly carrying charges for maintenance of his or her plot/ housing unit Members with share loans make individual principal and interest payments directly to the share lender.	Members pay monthly carrying charges to the cooperative for repairs and maintenance Members with share loans make individual principal and interest payments.	Residents/ members pay monthly rent specified in the lease to cater for loan, repairs and maintenance of the building Housing cooperatives pay for monthly for mortgages loan principal and interest, insurance and other services related to the building
Maintenance and Repairs	Individual unit/plot owner is responsible for all dwelling unit maintenance and repair The Cooperatives has responsible to create pathways within the plots and providing fencing services	Individual member has responsibility to repair and maintenance his or her housing unit The housing cooperative repairs and maintain the common facilities The housing cooperative hired resident members to provide maintenance and repair services.	The housing cooperative is responsible for both interior and exterior repairs and maintenance of the apartment The housing cooperative hire third part to provide repairs and maintenance of the property
<b>Membership Formation</b>	Members purchase the share proportionate to the number of plot or units he or she wants to own. The purchase price for member is much lower compared to non-member who wish to purchase plots through housing cooperatives The housing cooperatives use savings as down payment for the land they want to acquire. The member can reseller his/her plot or unit at a market rate	The member purchase share equivalent to the number of housing units he or she wants to own. The member can resale his or her housing at market rate Non-members pay high price than members The purchase price take into consideration the loan balance and inflation rate	The member who wish to leave the cooperative can sale his or her share in open market Housing cooperative has powers to approve or disapprove new member in joining the housing cooperatives The new member must be prepared to take new role of memberships in the cooperative The new member becomes obligated to pay monthly rent according to the rule and regulation governing that housing cooperative.
<b>Property Management</b>	Individual members take personal responsibility of their plots. The housing cooperative is dissolved once their objective of acquiring land is achieved	Member democratically elect their official at the AGM The resident members take care of their estate by having regular meetings. The executive board take in charge of the estate in terms overall management of the property and employees	Resident members take in charge of their housing cooperative through elected leaders The housing cooperative hires and oversees property management and employees.



### 2.5.2.1 Limited housing co-operative model (LHCM)

A limited housing cooperative model is one in which members raise funds to buy land, which is then divided into plots and distributed to members in accordance with their share's deposits. Share deposits and shares capital differ in that share are not refundable but can be transferred and for single member's shareholding is limited at 20% of the total shareholding of the cooperative. Share deposits, on the other hand, have no upper limit and are refunded to members upon request.

Forming a housing cooperative was motivated by the desire of members acquiring land for housing development. It was discovered that housing cooperatives adopted LHCM was for the purpose of access to land, finance and other resources for improving their living standard. Additionally, it was discovered that the housing cooperatives utilizing this model were disbanded once each member acquired their own plot (Nguluma, 2016). This sentiment was supported by by-laws of Chuna housing Cooperative plainly stated that the purpose of the housing cooperative's formation was to acquire land for its members.

While the LHCM was only intended to buy land and subdivide it into plots, other housing cooperatives occasionally extended their mandate to housing. According to KI from Nairobi teachers house cooperative, who was supported by eight KIs from other housing cooperatives.

*..... The major and occasionally the only goal of founding a housing cooperative is land acquisition for its members. However, those housing cooperatives who went beyond just purchasing land ran into major financial issues, and their projects were never completed. .... (Interviews and field data, August 2018; Nairobi).*

It is evident from the KIs statement that members join the housing cooperative with the specific purpose of becoming landowner. However, when the housing cooperatives extent their objective to housing provision, they find themselves unable to finance their housing development.

Regarding financing the model, the principal financing option for land acquisition was member contributions/savings. However, alternative methods of financing were confirmed by the member passbooks of Kenhurt Housing Co-operative showing loan deduction towards for land payment. In addition, loan schedule register accessed from

National cooperative housing union showed loans received from development partners for housing development.

The piece of land acquired by housing cooperative was individually owned. Individual plot titles belong to individual members in this model. In 2017, 100 titles were issued, according to the Chuna Housing Cooperative's member register book. The legal ownership under this model was stated to be by the issuance of land title, however, Tai housing co-operative and Bingwa housing co-operative went as far as issuing allotment letters or certificates to its members as sign of ownership.

The minute book for nine housing cooperatives revealed that they held Annual General Meetings (AGMs) every year, according to the cooperative society Act and the cooperative bylaws. Members exercised their democratic right to choose their leaders at the annual general meeting. It was noted that during AGM members approved the annual budget for the cooperative and appointing the new auditor. Site visit was programmed in their calendar of events in Urithi housing cooperative.

#### **2.5.2.2 Multiple mortgage housing co-operative model (MMHCM)**

In the multiple mortgage housing cooperative model the housing cooperative owns and maintains public areas like roads, recreation areas, playgrounds, and other community infrastructure, members own their individual homes and land (Bunce, 2013). The by-laws of Urithi Housing Cooperative, Kenhut Housing Cooperative, Chuna Housing Cooperative, and Shirika Housing Cooperative regarding formation made it very plain that the main goals for their establishment were land purchase and housing development. While the bylaws of Nairobi teachers, Tai and Bingwa housing cooperatives had land acquisition as their major goal.

This model utilized a financing strategy identical to the other two methods. The primary source of funding for the housing project was member contributions, and as evidenced by the members' passbooks from five housing cooperatives (Urithi housing cooperative, Kenhut housing cooperative, Chai Investment housing cooperative, Shirika housing cooperative, and Chuna housing cooperative), financial institutions like Sacco's played a critical role in financing members. This sentiment was supported by the KIs from the Urithi housing cooperative and was backed by seven KIs from different housing cooperatives that:

*“.... Before the project began, members were asked to put down payment of the housing project, with the remaining balance to be paid during the construction phase....”* (Field interview data from Nairobi, August 2018)

From the quote from the KI, it is clear that a lot of money is required to jump-start the housing project which might be not enough from member savings. This is the reason why the majority of the members seek financing from Saccos and other financial institutions. This argument was supported by the World Bank report (2017) which found that housing co-operatives in Kenya acted as a developer with projects ranging from 10 houses to several hundred with prices ranging from KSH 600,000 up to KSH 14 million. Location and infrastructure were major determinant of the cost of the housing unit.

In terms of management, the notable similarities to all three models are that members elect their leaders during the annual general meeting as shown by their minutes' book from the seven housing co-operatives [Tai housing co-operative, Urithi housing co-operative, Bingwa housing co-operative, Kenhut housing co-operative, Chai investment housing co-operative, Shirika housing co-operative, and Chuna housing co-operative]. The regular meeting is held to discuss resident welfare and emerging issues which is rare for LHCM and CHCM. The monthly service charge book from Kenhurt housing cooperative observed that each resident contributed 1000 Kenyan shillings to cater for repairs and other maintenance within the estate. It was observed that the social welfare book from Urithi housing cooperative contained a number of the activities members were involved in such as wedding ceremonies, funeral arrangements, dowry, fundraising for medical, school fees among others.

### **2.5.2.3 Continuing housing co-operative model (CHCM)**

According to Jimoh (2012), in a continuous housing cooperative concept, the members collectively control the land, dwellings, and common areas. The housing cooperative's members who will be employing this approach have a tradition of saving money for real estate purchases. This is consistent with the cooperative model's goal of encouraging thrift among its members by giving them a chance to save money (Magumula, and Ndiege, 2019).

According to the bylaws of Shirika Housing Cooperative which adopted this model indicated that the major goal of establishing a housing cooperative was to house the

members and non-members. The Audit report revealed that the surplus earned during the year is shared amongst members on a pro-rata basis by their shareholdings. For instance, KIs from Shirika housing co-operative said (and was supported by seven KI from other housing co-operatives) that:

*"... our apartment host both members and non-members since some of our members have homes elsewhere.....(Field interview data from Nairobi, August 2018).*

The KI demonstrated that their main objective of this model is to provide housing for both members and non-members. Most of these housing co-operatives are found in an urban setting where acute shortage of housing is the order of the day. This model has provided alternative provision of affordable housing particularly to town dwellers.

The finance model is similar to the other two models in that it relies mostly on member savings, but because of the huge sums needed to either build or purchase the building, they are compelled to seek financing from financial institutions. It was also discovered that the Shirika housing cooperative's member passbook showed member contributions towards apartment acquisition. The member is anticipated to receive more returns from investing more shares on the building. Unlike the other two types, members of this housing cooperative model hold shares rather than actual title for housing unit.

In terms of management, the housing co-operative hold annual general meeting to elect their leaders. The minute book from Shirika housing co-operative, chai housing investment co-operatives, and Nacico housing co-operative found that the board of directors was in charge of collecting rent from their apartment on behalf of the members. The rent is determined by the market forces and not the members. Baiges *et al.*, (2019) found that monthly rent of housing co-operatives in Zurich was regulated and fixed according to the general costs of the housing project.

### **2.5.3 Analysis of housing cooperative models**

S.W.O.T. (*Strengths, Weakness, Opportunities, and Threats*), is a simple, but powerful business planning tool. It can assist a co-operative to concentrate on what makes it strong, position a co-operative to reduce threats, and hopefully leverage unseen opportunities. The SWOT analysis was based on the finding from profiling of

housing cooperative models which had seven parameters namely formation, ownership, financing, monthly costs, maintenance and repairs, membership formation and property management. Three models were identified from these parameters are; Limited Housing Co-operative Model (LHCM), Multiple Mortgage Housing Co-operative Model (MMHCM), and Continuing Housing Co-operative Model (CHCM). Several scholars (Jimoh and Van Wyk,2014; Allegheny Places, 2005; Rajneesh and Mitashi.2017) adopted SWOT analysis in their studies.

**Table 2. 5 : Analysis of housing cooperative models**

	<b>Strength</b>	<b>Weakness</b>	<b>Opportunities</b>	<b>Threats</b>
<b>Limited housing cooperative model</b>	Easy to start the housing cooperative Easy to find available land Easy to mobilize resources Relatively affordable Scattered site/mixed income housing	identification of land without Infrastructure Lack of economic of scale in housing development Poor connectivity of the social amenities Long delay in housing development Limited funding No comprehensive housing plans Lack of integrated affordable housing units	Individual ownership of title deed No restriction of expansion and redesigning Incremental housing development Appreciation of land value Economic of scale in land acquisition	Lack of expertise in housing Limited availability of technology Difficult to achieve better quality (limited finances) High security issues Regulatory hurdles Predatory lending
<b>Multiple mortgage housing coop model</b>	Availability of infrastructure for housing development Collaborate with Partners in raising capital Collaborate with Partners to provide technologies Economic of scale in housing development Adequate social amenities Housing development is less than 3years	Collectively ownership of common facilities High densely populated Compliance with the rule and regulation of the estate Housing costs are high and continue to rise There is a high shortage of affordable housing for low- and moderate-income families	Integration of sustainable parameters in housing development Strong market demand for housing Focus on Efficiency & Effectiveness Focus on member Satisfaction Strong capital base Skilled and professional management Improved quality of life and dignity of residence Better conditions for human development, employment and economic growth	Restriction of expansion or changing or design Insufficient, affordable and safe housing for all populations Aging housing stock – maintenance and enforcement Available vacant land Conservative housing design Aging infrastructure Transportation access (housing-jobs)
<b>Continuin Housing coop mod</b>	Adequate of financial resources Better hygiene and sanitary conditions More cohesive and socially inclusive urban growth Contribution towards climate response and mitigation Available housing choices, such as rental housing, and security of tenure	Crime/public safety concerns Abandoned/vacant property Older housing stock Insufficient/aging infrastructure in older communities (roads, sewers, water, utilities, transportation, etc.) Changing demographics (e.g. population loss)	High revenues collected Appropriate location (near economic hubs) They serve as residential and commercial purposes High demand for both commercial and residential No restriction or control on rent rates Located in highly densely populated Invest in areas with minimal weaknesses	Unstable rent prices / Fluctuations Use of green space Multiple county governments levy Lack of social and transportation infrastructure High property taxes

### **2.5.3.1 The limited housing cooperative model**

The housing cooperatives adopted the model believe on empowering members through land acquisition. The model had high power of resource mobilization. In addition, the model showed high affinity to provide land to low- and middle-income members. Due to lack of infrastructure and other basic services, it becomes too expensive to build affordable housing where the housing cooperative had bought land. Also, the majority of members find it impossible to build dwellings due to lack of access of credit from financial institutions. Members thus continue to live in rented housing for a considerable amount of time after purchasing a plot. They occasionally end up selling the land they had planned to build home.

With the exception of two KI from Bingwa and Tai housing cooperatives, it was noted that eight KIs from different housing cooperatives issued land title deeds to their members as proof of ownership of the plot of land. According to the World Economic Forum (2019) the major investment in housing development start with land. Such an observation was corroborated by KI from NACHU, who stated:

*“.....Construction of housing largely depends on the availability of land where the housing will be elected on.....”* (Interviews and field data, August 2018; Nairobi).

The board of directors is in consultation with members acquire land where the members are willing and comfortable to reside. Many Kenyans desire to own a piece of land where they can build their own home while they are strong and not when retired. Rent payment after retirement is not a viable option.

### **2.5.3.2 The multiple mortgage housing cooperative model**

The suitability of this model in addressing the housing shortage was examined by SWOT analysis. An internal memo from Urithi housing co-operative in 2018 in Plains view Juja was used. It was observed that 78 units of three-bed room house were issued to the owners. It was noted that housing co-operatives bought the land and constructed the housing units in a gated community. This argument is supported by [the KI from Urithi housing co-operative, KI from Kenhut housing co-operative, KI from chai investment housing co-operative, KI from Shirika housing co-operative, and KI from Chuna housing co-operative] explain that:

*“.... Houses constructed through this model were averagely affordable because they were constructed in large scale with adequate infrastructure and social amenities.....”* (Interview field data, Nairobi, August 2018).

The construction of housing units in the gated community contributed to the reduction of the total cost per unit and also enhanced the security amongst the residents. Location and infrastructure are the major determinants of affordable housing. Building housing on large scale reduces the overall costs of labour, material, and administration with a great margin.

However, the study found out that this model had some weaknesses and threats that made the model unpopular among the citizen. Member passbook from Urithi housing cooperative observed that a huge amount of money ranging from 2 million to 5million was required for housing development. The majority of the members of housing co-operatives cannot afford this amount due to their low level of income. It was observed bylaws and regulations from [Urithi housing co-operative, Kenhut housing co-operative, chai investment housing co-operative, Shirika housing co-operative, and Chuna housing co-operative] prohibit any alteration or modification or extension of any kind to the existing housing units. This discourages many people who desire to make some adjustment in their housing unit.

### **2.5.3.3 The continuing housing co-operative model**

The suitability of the model in addressing the housing shortage was based on a SWOT analysis. The continue housing co-operative model was designed to provide affordable housing for their members. This model has been modified to suit the Kenyan context by producing housing for both members and non-members. The two models were producing housing units for members but this model is producing housing units for the market which is good progress towards addressing the housing shortage in Kenya. Most of these housing co-operatives are based in an urban setting where an acute shortage of housing is dominant. The housing co-operative stabilize prices in the market which was previously dominated by private investors.

The housing co-operative adopting this model require huge sums of money to deliver the housing units. However, it is very difficult for housing co-operatives to get a mortgage from a financial institution for housing development because of stringent lending conditions. Also, members of the housing co-operative might not have the



requisite knowledge and skills to run this kind of housing co-operative hence they hire professionals to run the business on their behalf. Notably, the housing co-operative adopting this model had closed membership.

## **2.6 Conclusion and Recommendation**

### **2.6.1 Conclusion**

The limited housing co-operative model was mostly preferred by majority of the respondent of housing cooperatives in Nairobi City County which implied that majority of members of the housing cooperatives acquired the housing through this model. The biggest challenge of this model is lack of collective construction of housing and lack of infrastructure and other social amenities among others. Hence make this model not suitable to provide sufficient number of housing units for their members.

The multiple mortgage housing cooperative model is commonly used by salary people who are able to collectively finance their housing. The major advantage of this housing cooperative model is it constructs housing in large scale hence lowering the cost per member and the major challenge is how to finance the project up to the completion.

The continuing housing cooperative model refers to housing cooperative members collectively own the land, dwellings, and common areas. In this model the residents are expected to raise monthly contribution to cater for loan repayment, repairs and maintenance of the building. This model is relatively cheaper compare to other two model discussed in this paper. However, the biggest challenge to the model is that there is no individual ownership of the property that put off many people from investing this model. In conclusion, three models have different test and preference according to the member specification.

### **2.6.2 Recommendation**

Therefore, the paper recommends for adoption of the multiple mortgage cooperative model, which accommodates diversity interests of various classes of people and provide sufficient sustainable affordable housing collectively. However, the ministry of finance needs to restructure housing finance system to accommodate the housing needs for the low- and middle-income households for the model to be sustainable.

The paper recommends to the state department of cooperative to ensure before registration of housing cooperative must be accompanied by appropriate model selected for housing development. In addition, the housing cooperative should include housing cooperative model in their bylaws.

Also, the paper recommends to the ministry of finance to give special consideration to housing cooperatives in terms of accessing affordable housing finance from financial institutions. The paper recommends to the state department of cooperatives to regularly conduct the baseline survey to ascertain the status of housing cooperatives in terms of management of housing cooperatives, land owned by housing cooperatives, number of housing units produced and financing model for housing cooperative.

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## CHAPTER THREE

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### **3.0 Housing Co-operatives Member Participation and Housing Affordability in Nairobi City County, Kenya**

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#### **3.1 Abstract**

Member participation is an active process in which people take initiatives and actions stimulated by their thinking and deliberation, which affect co-operative performance. Nevertheless, low member participation in housing co-operative is the biggest challenge facing housing co-operatives. This paper examined the following objectives; to determine the social-economic characteristics affecting member participation in a housing co-operative, to analyze housing affordability indicators, to describe the level of member participation in the housing co-operatives, and to examine the influence of members' participation on housing affordability in housing co-operatives in Nairobi City County, Kenya. Data was collected from 35 housing co-operatives societies registered under the state department of co-operatives in Nairobi City County. The paper collected both primary and secondary data and was analyzed both descriptively and inferentially. Hypothesis testing was analyzed by mixed-effects model and correlation analysis. The result revealed that socioeconomic characteristics influence member participation in housing co-operative also, there was a significant relationship between member participation and housing affordability. Therefore, the paper recommends that each housing cooperatives should create conducive environment for the member to participate in cooperative activities and patronizing services. Also, the housing cooperative should ensure there is continuous provision of education and training to empower members in decision making. Also, the State Department of Co-operatives should sensitize co-operative members on the importance of active participation through co-operative forums

**Keywords:** Participation, Co-operatives, Affordability, Housing deficit.



### 3.2 Introduction

A world where only a few people can afford housing is not a sustainable one to live in. As affordable housing offers a great quality of life and personal fulfillment opportunities such as social, environmental and economic aspect (World Economic Forum, 2019, Golubchikov and Badyina, 2012). As of now in the world, provision of safe and adequate housing in most cities has been the major challenge facing the society. According to the United Nation human rights report (2020), 1.8 billion people live in life-threatening structures and sometimes lack even a toilet, many due to unresponsive housing supply and scarcity of affordable housing (UN-Habitat, 2020). Bredenoord (2016) noted that most pressing housing needs for low- and middle-income households is affordability, therefore it is apparent that housing shortages cannot be solved without focusing on sustainable affordable housing.

According to Schaeffer (2015), housing co-operatives has proven to be a successful housing model designed to provide sustainable and affordable housing to low- and middle-income residents cross the globe. Crabtree *et al.*, (2019) argued that housing co-operative provides affordable housing that increases member control, ownership opportunities and preserve long term affordability. Similarly, Sørvoll and Bengtsson, (2020) observed that housing cooperative mobilize savings from their members which allow them to access affordable financing without any collateral. In addition, Lang, (2015) opined that resident participation is widely considered as having a positive impact on housing affordability and social cohesion. Consequently, in developed nations including Canada, Sweden, Norway, and Uruguay have adopted a number of co-operative models, including full equity co-operative models, limited co-operative models, and non-equity co-operative models that will facilitate provision of affordable housing to suit diversity of different people (Crabtree *et al.*, 2019).

International Co-operative Alliance (2018) defines a housing co-operative as a group of people united to provide affordable housing through democratic member control. Housing co-operatives are private own entities run and managed by the members. As such, housing co-operatives emphasize the importance of empowering individuals through democratic member participation. Democratic member participation influences the overall costs of affordable housing. The essence of the housing co-operatives is anchored on member participation, and the lack of such engagements

would make them lose their true identity (Ponka, 2018). Member participation in this context refers to the degree of involvement in the co-operative activities and usage of the services (Mahazril *et al.*, 2012). Visković *et al.*, (2020) study in Slovenia found that members were involved in planning and designing, building, managing, and cohabiting, which reduced the total construction cost. In Spain, members developed strategies, approved and monitored projects, paid the entry fee, attended workshops and general assembly (Cabré and Arnau 2017). Sushila *et al.*, (2010) study among co-operatives in Malaysia found that members' participated in the policy-making process through attending meetings and patronizing co- operative products and services that led to affordable housing. In India, a study by Prakash (2012) established that active member participation in business operations and organizational structure led to improved co-operative performance.

In Africa, the provision of affordable housing was pegged on active member participation in housing cooperatives by various African studies. In Angola, a study by Centre for Affordable Housing Finance (2017) found that members of housing co-operatives participated in capital contributions, contributing monthly fixed charges, electing a board of directors. This action led to improved security of tenure, infrastructure, and proper housing maintenance that reduced the overall cost per member. In Zimbabwe, members of housing co-operatives participated through contributions towards a capital share contribution, building material, constructions, and attending the general meeting that led to affordable housing (Chirisa *et al.*, 2014). However, housing affordability in the housing co-operative is attributed to many factors that most countries in Africa have tried to address. Similarly, in South Africa, Jimoh and van Wyk (2012) found that members of the housing co- operative participated in the training, financial contribution, attending the meeting, procurement of materials, and land acquisition.

The problem of housing in Kenya has been progressively increasing as people migrate to urban towns. It is always difficult to find adequate, affordable housing, and this is reflected in the huge amount of housing deficit across the country. According to Mwangi (2020), housing deficit stands at 2 million housing units with annual demand of 250 000 units against a supply of 50 000 with only two percent set aside for low-income households. Although in 2017 the government of Kenya initiated the Big 4 Agenda which established the Affordable Housing Programme (AHP) to address the

issues of affordable housing, particularly to low – middle income; several housing models have been adopted in Kenya to facilitate the provision of affordable housing, but the housing co-operative approach has received little attention in Kenya.

Housing co-operatives have contributed to provision of affordable housing with their meager resources from the members. In 2019 memberships of housing co-operatives in Nairobi City County was 48,803 with a share capital of Ksh. 852,368,182 and asset base of Ksh. 15,394,682,905 (State Department of Co-operative (SDC), 2019). The SDC report further states that the average growth rate of share capital and assets has been 0.25% and 0.11%, respectively, over a three-year period. This is a clear indication that housing co- operatives can provide sufficient affordable housing in Kenya, as reflected through their member contributions. However, Mbitio and Iteyo (2018) found that the issues of land conflicts in the housing co-operatives were rampant among members, leading to disunite and lack of participation in various housing co- operatives. Wanyama 2009; Muthyalu 2013; and Hidayat *et al.*, 2014 have emphasized the importance of active member participation in co-operative activities as the backbone of the success of the co-operatives in Kenya. To this end low member participation is the biggest challenge facing housing co-operatives in provision of affordable housing.

Several scholars have made contributions in member participation in the housing co-operatives. A study by Ronoh *et al.*, (2020) assessed the effect of financing decisions on housing co-operatives, particularly the effect of budgeting techniques on the performance of housing co- operatives. Similarly, Kimanzi *et al.*, (2019) investigated the financial structure and operating efficiency of housing co- operatives. Onchieku and Ragui (2019) investigated the effect of strategic leadership on the performance of housing co-operative societies in Nairobi city county, Kenya. Wangechi (2018) sought to establish the determinants of financial sustainability of housing co-operatives in real estate development. Despite the valuable contributions made by the previous studies, low member participation in the housing co- operatives has not comprehensively studied.

The International Co-operative Alliance (ICA) in the 2nd and 3rd co-operative principle (Democratic Member Control and Member Economic Participation) clearly state the importance of a member being involved in co-operatives organization which

is the spirit of co-operatives. According to the International Labour Organization (ILO) shared the same fundamental philosophical tenets with ICA emphasizing on active member participation in the management and administrative functions their co-operatives (ILO and ICA, 2015). The Sessional Paper No. 3 of 2016 on National Housing Policy (2016) emphasized co-operation and active participation of all relevant actors and individuals in the housing sector. This argument justifies why it is essential to examine the role of member participation in housing co-operatives. Therefore, the delivery of adequate affordable housing largely depends on active member participation. Low member participation is still a challenge for housing co-operatives which needs solutions.

Specific objectives of the study are: (i) to analyze housing affordability indicators, (ii) to analyze member socioeconomic characteristics on housing affordability in the housing co-operatives, (iii) to describe the level of members' participation in the housing co-operatives, and (iv) to examine the influence of members' involvement on housing affordability in housing co-operatives in Nairobi city county, Kenya. The following research questions were addressed: what are housing affordability indicators? What is the level of member participation in the housing co-operatives? Research hypothesis: Ho: Member socioeconomic characteristics has no significant effect on the housing affordability in the housing co-operatives, Ho: Member participation has no significant effect on the housing affordability in the housing co-operatives.

### **3.3 Theoretical Underpinnings**

The study was guided by participatory democratic theory. Pateman (1970) argues that an individual need to have equal power to make valuable participation for an effective decision-making process. Democratic participation allows individuals to exercise their democratic rights in various co-operative activities. Co-operatives are known to be schools of participation. This installs confidence among the members to uphold and defend their housing co-operative in one spirit. The choice of theory was necessitated by the multidisciplinary nature of the housing co-operative, which required a theory that can adequately cover the housing co-operative needs of the members and at the same time address issues of participation. The housing co-operatives fulfil the wishes and needs of the members. Each member has a responsibility and obligation to support and promote co-operative activities by

involvement in decision making and patronization. In the housing co-operatives, nothing can be decided outside the members. This is a clear indication that members are the backbone of the co-operatives and lack of membership means that the co-operative does not exist (Sørvoll and Bengtsson 2018).

Active involvement of members in decision-making and patronization of services is what makes co-operative housing affordable. Affordability can be achieved through the pooling of resources so that their buying power is leveraged, leading to lowering the cost per member in all transactions (Sanjinés and Barenstein, 2018). Member involvement in price negotiation, participation in meetings, attending training, selection of housing location, and consultation on housing design led to affordable housing (Taiwo and Okafor 2011). Affordability is evident when members actively participate in all stages of housing development. Member participation has empowered individuals to become part and parcel of the political process, and their voice has been well recognized (Davidson *et al.*, 2007).

### **3.4 Methodology**

Mixed method approach incorporated the quantitative and qualitative approach was adopted for this paper. The quantitative data was collected using questionnaires to assess the significance of member participation on housing affordability through housing co-operatives in Kenya without considering experimental control by the researcher, and a qualitative approach was used to collect data from the key informant through interviews. The causal approach was, however, used to determine the cause-effect relationship between member participation and affordable housing. The descriptive design as adopted in the study was to determine the status of phenomena; to fact find and examine traits and characteristics without necessarily exploring relationships of causative factors (Saunders and Thornhill, 2012). The cross-sectional approach helped to collect data from one point in time, which is considered to be useful where resources are limited (Jogulu and Pansiri, 2011).

The study was conducted in Nairobi City County because it hosts the highest number of housing co-operatives and membership. Second, Nairobi City County has the highest informal settlements without adequate housing (International Institute for Environment and Development, 2019). Third, Nairobi City County is the largest and fastest-growing city in Kenya (Mutisya, 2015). Hence, it provided perfect ground for

collecting valid and reliable data about the effect of member participation in housing co-operatives on housing affordability.

Based on multistage sampling, the paper employed both non-probability and probability sampling techniques to select the housing co-operatives and members to participate in the study. The multistage sampling technique was adopted considering the multilevel structure of the population of members nested (grouped) in a housing co-operative. The first stage of multistage sampling was to draw 35 housing co-operatives to be considered in the study based on purposeful sampling. Criteria used to select 35 housing co-operatives out of 115 were based on compliance with the co-operative society act amended 2004, stating that every registered co-operative must file annual returns. The paper considered a five- year period (from 2012 to 2017) consecutive filing of audit books. The co-operative housing models were used as strata to group the housing co-operatives based on the model adopted. The prior paper carried out of profiling housing co-operatives models informed the stratification, which grouped the housing co-operatives into three models. Proportionate distribution of housing co-operatives adopting the ascertain model was used to determine the number of housing co-operatives selected from each model.

The second stage of the sampling technique was to choose the sample size of 397 members from the 35 housing co-operatives selected in stage 1. The number of members selected within each housing co-operative was based on the proportionate membership distribution with probability proportional to the size of co-operative (PPS) with an average of 11 members per housing co-operative. Simple random sampling was then used to select the members to include in each housing co-operative. Simple random sampling was used to select members from the register books in a respective housing co-operatives. The simple random sampling was used to select sample size of 397 members from a total sample of 48,803 respondents in 35 active housing cooperatives in Nairobi City County based on the sampling formula for a finite population given by;  $n = \frac{N}{(1 + (N \times e^2))}$  where n is the sample size, N is the population size and e the permissible error. This formula was given provided by Yamane (1967) as a simplified sample size computation for a finite population.

The calculation as follows:

$$n = \frac{48,803}{(1 + (48,803 \times 0.05^2))}$$

$$n = \frac{48,803}{123.0075}$$

$$n = 397$$

The study used both quantitative and qualitative data collection techniques. Quantitative data were collected by use of survey structured questionnaire administered to the members of housing co-operatives using a 5-point likert scale (Strongly Disagree 2 – Disagree 3 – Not Sure 4 - Agree 5 - Strongly Agree). A structured questionnaire was designed to collect information about the effect of member participation in housing co-operative on housing affordability. A total of 397 copies of the questionnaire were administered to the members of 35 housing co-operatives. In addition, qualitative data were collected using key informant interviews (KIs), member's interviews and document review analysis. A total of 10 KIs were selected based on knowledge, experience and position they held in their respective organisations include Deputy commissioner for state department of cooperatives, the chairman of National Cooperative Housing Union (NACHU), the Project manager of Urithi housing cooperative, the chairman of Kenhut housing cooperative, the general manager of Nairobi Teachers housing cooperative, the Treasurer of Shirika housing cooperative, the general manager of Chai Investment Cooperative, the general manager of Tai housing cooperative, the chairman of Bingwa housing cooperative, and the general manager of NACICO Housing cooperative. The KIs provided information regarding experience in member participation in housing co-operatives, challenges prohibiting the member participating in housing co-operatives activities and challenges facing affordability of housing. A total of 10 members of housing co-operative were selected randomly from different housing co-operatives from membership register. Qualitative data were recorded using field notes and electronic audio devices then transcribed, categorised, coded and grouped into themes for analysis by help of Atlas software. The qualitative data was used to supplement data collected using quantitative technique.

Creswell (2011) recommends that pre-testing of the questionnaire should be carried out and that it should include groups within the potential research participants. A sample of 30 members was randomly selected from different housing co-operatives from neighbor county (Kiambu County) who shared similar characteristics with Nairobi City County. The feedback from the 30 respondents led to the re-wording of

some of the questions, prior to its administration for the main study. The pilot test data collection instrument was assessed for both internal consistency and validity. This study used the Cronbach's alpha ( $\alpha$ ) as an internal consistency measure. Reliability and validity of the study construct data collection instrument showed adequately reliable and valid measurements of the constructs by the indicators that were retained.

The validity and reliability results are shown in table 3.3. For validity, construct validity was assessed for both constructs by testing for convergent and discriminant validity to determine that the observed indicators measuring the same construct have high inter-correlations amongst themselves and no correlations with indicators of other constructs (Kline 2011). Reliability was checked by assessing the internal consistency of the constructs as measured by the indicators using Cronbach's alpha. The internal consistency threshold was set at to the acceptable standard of Cronbach alpha above 0.7 (George and Mallery, 2003 cited in Gliem and Gliem, 2003; Fraenkel and Wallen, 2000; Sekaran, 2010). As shown in the table, both constructs have alpha values greater than 0.7 implying adequate reliability. Further analysis was based on the 18 retained indicators of housing affordability and the 13 indicators retained on the indicators of member participation. Table 3.4 shows the factor loadings of the 2 variables detailing the observed indicators that were expunged or retained.



**Table 3. 1 : Reliability and Validity**

	AVE	Squared correlations	N0. Of items	KMO & Bartlett's test	Cronbach's Alpha All items
<b><u>All indicators</u></b>					
Member participation	0.512	0.356	18	KMO=0.745, Chi(153)=2980.483, p-value=0.000	0.878
Housing affordability	0.513	0.254	26	KMO=0.783, Chi(325)=4558.803, p-value=0.000	0.862
<b><u>Retained indicators</u></b>					
Member participation	0.568	0.267	13	KMO=0.850, Chi(78)=2198.483, p-value=0.000	0.879
Housing affordability	0.589	0.132	18	KMO=0.861, Chi(153)=3304.803, p-value=0.000	0.884

**Table 3. 2 : Factor loadings for Member participation**

Indicator	Factor Loadings
1 Attending meetings	0.805
2 Electing board of directors	0.603
3 Payment of housing co-operative dues	0.782
4 Attending social welfare meeting	0.034
5 Recruitment of new members	0.907
6 Development of strategic plan	0.376
7 Approval of annual budget	0.678
8 Provision of building materials	0.688
9 Participation in project appraisal	0.744
10 Attending education and training	0.874
11 Attending exhibition and workshops	0.326
12 Participation in project maintenance	0.919
13 Participation in sharing dividends	0.303
14 Raising funds for co-operative	0.613
15 Provision of security services	0.128
16 Participation in selection of project site	0.723
17 Participation in project execution	0.805
18 Project planning and design	0.805

**Table 3. 3 :Factor loadings for Housing affordability**

<b>Indicator</b>	<b>Factor Loadings</b>
1 Land Acquisition	0.941
2 House Finishing	0.635
3 Safety and security of properties	0.482
4 Leasehold / Freehold House	0.698
5 Heating systems	0.387
6 Playground and green area	0.281
7 Near to public schools	0.732
8 Near to public transport	0.591
9 Type of the roof	0.185
21 Near to health care centres	0.628
11 Type of Pavement used	0.195
12 Status of the Neighborhood	0.355
13 Materials and waste management	0.543
14 Indoor environmental quality	0.708
15 Near to shopping facilities	0.902
16 Status of the location	0.299
17 Traffic Congestion	0.642
18 Access to leisure facilities	0.215
19 Interest rates and mortgage	0.779
20 Near to workplace	0.651
21 Type of building technology	0.354
22 Near to child care facilities	0.502
23 Water and Energy efficiency	0.514
24 Recreational facilities	0.679
25 Plot layout	0.533
26 Size of the House	0.875

Data analyses were carried out with the aim of developing criteria to test the study hypothesis and draw conclusions on the objective of the study. The measurements of each of the two constructs were based on indicators that were formulated into ordinal scale measurements in a questionnaire. The indicators were all measured on a 5-likert scale and only the indicators that were retained following validity and reliability assessment were used in the main study.

The measurement of the dependent variable (housing affordability) sought to determine the level of importance that the participants' members gave on proposed factors of affordability that were retained in the pilot study. The criteria used to identify 18 indicators of the level of members' participation was done through an extensive literature review and semi structured interviews with key informants and members of housing cooperatives in Nairobi City County. Respondents ranked the housing affordability criteria in relation to their housing co-operatives on an ordinal scale of importance with 5-likert scale ranging from not important at all-1 to most

important-.5. The indicators were reduced to a single overall index of housing affordability which was calculated as a weighted average of the ordinal scores from the indicator responses of the dependent variable. The weights for the indicators were determined as proposed and used by Mulliner *et al.*, (2012), by dividing the mean score by the sum of mean scores and multiplying by 100 as given by the equation below.

$$\omega_i = \frac{\bar{X}_i}{\sum_{i=1}^{18} \bar{X}_i} \times 100$$

Where ;

$\omega_i$  is the weight of indicator i

$\bar{X}_i$  is the mean of indicator i

The independent variable (member participation) was measured by the 13 retained indicators which sought to determine the level of member participation in relation to their housing co-operative. The indicators were grouped into four dimensions, then reduced to one overall member participation index. To reduce the dimensions of member participation into a single composite measure, a weighted index was used where the participation index of each indicator for the sample was deduced and used as the weights. The approach of determining the participation index was used by Tilahun (2008) and Roman (2010) to measure the level access to and utilization of family planning information among rural women and the empowerment status of rural women from scores collected from different indicators. The indexing was also adopted by Kefale *et al.* (2012) in determining extent of member's participation in rural co-operatives at different levels of participation in different activities. Considering the 5-Likert scale the overall participation index for each indicator will range from minimum of 1 to a maximum of ( $5 \times \text{sample size}$ ) where the sample size was expected to be 397; relative to the response rate. The overall participation index ( $P_i$ ) for each indicator was dependent on the frequencies of respondents per score and was be given by the equation:

$$P_i = \sum_{j=1}^5 F_j \times j$$

Where ;

$P_i$  is the overall participation index of indicator i

$j$  are the ordinal Likert scores (1 to 5) on level of agreement of the respondents to indicator  $i$

$F_j$  is the Frequency (number of respondents) who responded with score  $j$

The overall participation index for the indicators were then used to determine the weight of the indicators given by the equation

$$\omega_i = \frac{P_i}{Score_{Max}}$$

$\omega_i$  is the weight of indicator  $i$

$P_i$  is the participation index of indicator  $i$

$Score_{Max}$  is the maximum score for the indicator = 5×number of retained participants in the main study.

Descriptive statistics was used to analyse and interpret findings in the form using frequency table percentages, mean, scores and measures of dispersion for the study variables. The mean of the indicators ordinal scores was used as the measure of central tendency and the standard deviation as the measure of dispersion with a coefficient of variation (CV). The coefficient of variation shows the dispersion (standard deviation) relative to the mean of the variable expressed as a percentage of mean. Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). The models fitted were used to test the study hypothesis developed for the assumptions of normality and heteroscedasticity were tested. The models fitted to assess the study hypothesis considered multi-level statistical analysis techniques using the following equations

In the equations:

$$Y_{ij} = \gamma_{0j} + \beta_1 X_{1,ij} + \varepsilon_{ij} \dots \dots \dots \text{(equation 1)}$$

$$\gamma_{0j} = \beta_{0j} + \mu_{1j} X_{1,ij} + \mu_{0j} \dots \dots \dots \text{(equation 2)}$$

The second equation can be substituted into the 1st equation to yield a formulation given by;

$$Y_{ij} = \beta_{0j} + \beta_1 X_{ij} + \mu_{1j} X_{1ij} + + + \mu_{0j} + \varepsilon_{ij}$$

In the equations:

$Y_{ij}$  is the level of housing affordability as viewed by respondent  $i$  nested from housing co-operative  $j$ ;

$X_{1,ij}$  is the participation by member  $i$  nested in co-operative  $j$ ;

$\beta_1$  to  $\beta_6$  are the fixed effect estimates coefficient of the predictors (level-1 effects)

$\gamma_{0j}$  is the intercept which has a separate specification equation due to the 2 levels assumed to cause variation in housing affordability. In the intercept equation;

$\beta_{0j}$  is the level 1 intercept which is the average housing affordability for the entire population; and

$\mu_{0j}$  is the county specific effect (cluster specific) random intercept.

$\mu_{1j}$  is the random slope (random coefficient) of independent variables at co-operative  $j$  (level-2 coefficients of  $X$ )

$\varepsilon_{ij}$  is the overall error term

Mixed effect models fitted were assessed for the assumptions of normality and homoscedasticity. The models fitted to assess the study hypothesis considered multi-level statistical analysis techniques. Assessment of assumptions of mixed effect models should be carried out based on exploratory graphical analysis unlike other linear regression modelling techniques that can be assessed using classical tests. The literature allowing for extension of model assumption techniques used in classical linear models to hierarchical linear mixed effect models is heavily fragmented thus techniques involving visualisation plots of residuals are recommended as to assess the distributional properties of the model residuals at both levels of the data structure (Loy, 2013).

### **3.5 Findings and Discussion**

#### **3.5.1 Response Rate**

Out of the 397 respondents sampled, data collection was only successful for 360 respondents. All the 35 selected housing co-operatives were housing co-operatives. This translated a success collection rate of 100% representation of all the housing co-operatives sampled and a 91% response rate of all the respondents which was considered good and adequate considering recommendations by Asire, (2017); Richardson (2005), who cited Babbie (1973) and the Australian Vice Chancellors' Committee & Graduate Careers Council of Australia (2001) and concluded that response rates of 60% or more are both desirable and achievable.

### 3.5.2 Housing Affordability

Housing affordability measurements in this study considered wider dimensions of the criteria that emphasized on economic, environmental and social aspects that affect households as noted by (Mulliner *et al.*,2012; and Mulliner *et al.*,2015). Housing affordability was the dependent variable and was measured using 18 observed indicator variables. The descriptive analyses of housing affordability indicators were carried out on each of indicators. The respondents ranked the housing affordability criteria in relation to their housing co-operatives on an ordinal scale of importance ranging from 1-not important at all, 2-less important, 3-important, 4-slightly important and 5-most important as proposed by (Rosli.*et al.* 2016; and Mulliner and Maliene, 2015). An overall index of housing affordability was calculated as a weighted average of the ordinal scores from the indicator responses.

The descriptive statistics are calculated and presented in Table 3.4. The mean of all the indicators is above 3, which that most of the responses. The standard deviations and coefficient of variations are the measures of dispersion; most of the indicators have CVs below 50%, implying low variations relative to the mean. The overall mean score of housing affordability was 4.202 with a standard deviation of 0.805, and a coefficient of variation of 25.13% implied that the housing delivered by housing co-operatives was found to be affordable according to the member's opinion. An overall index of housing affordability was calculated as a weighted average of the ordinal scores from the indicator response.

**Table 3. 4 : Analysis of Housing Affordability Indicators**

<b>Indicators</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Weight</b>
Land Acquisition	4.194	0.779	19%	5.821
House Finishing	4.138	0.819	20%	5.743
Safety and security of properties	4.110	0.764	19%	5.705
Leasehold / Freehold House	4.089	0.826	20%	5.675
Interest rates and mortgage availability	4.086	0.825	20%	5.672
Size of the House	4.079	0.813	20%	5.661
Near to public schools	4.075	0.809	20%	5.656
Near to public transport	4.024	0.872	22%	5.585
Near to workplace	4.014	0.738	18%	5.571
Near to health care centres	3.961	0.790	20%	5.498
Near to child care facilities	3.958	0.817	21%	5.493
Water and Energy efficiency	3.958	0.789	20%	5.493
Materials and waste management	3.920	0.775	20%	5.441
Indoor environmental quality	3.916	0.819	21%	5.436
Near to shopping facilities	3.913	0.797	20%	5.431
Recreational facilities	3.909	0.764	20%	5.425
Traffic Congestion	3.858	0.857	22%	5.354
External pollution	3.848	0.833	22%	5.340
<b>Overall Housing Affordability</b>	<b>4.003</b>	<b>0.805</b>	<b>20%</b>	

### **3.5.3 The influence of members' socioeconomic characteristics on co-operative housing**

The socioeconomic characteristics studied included gender, years of membership, age, marital status, education level, employment status and income level of the members. This characteristics of the members of the housing co-operatives were assessed and their possible association with the members' perception of housing affordability (Table 3.5). The analysis on the gender of the respondents showed that 50 percent of the respondents studied were female. The results also showed that the gender of the respondents had no significant association with their perception of housing affordability ( $t=-0.663$ ,  $p\text{-value}=0.508$ ). This is supported by the co-operative bylaws of most of co-operatives who gave equal opportunity of participation for both genders. On years of membership, majority had about 4 to 6 years of memberships with 26.32% while 11.36% of the respondents had over 10 years of memberships. One of the members who was interviewed stated that.

*.....this is my 6<sup>th</sup> year of membership in my housing co-operative and managed to save enough to own home where am staying currently....*

*“(Interview field data, Nairobi, August, 2018).”*

Respondents with more years of membership tended to have higher perception of housing affordability which was found to be significantly associated with membership ( $F=2.423$ ,  $p\text{-value}=0.035$ ). The mean-score of housing affordability for respondents with over 10 years of membership was 3.470 while that of those with less than 2 years of membership was only 2.037. According to the study by Aazami *et al.*, (2019), 7-9 years' membership is appropriate for a member to accumulate enough savings towards acquisition of affordable home.

The age of the respondents was also found to have a significant association with housing affordability. The mean-score of respondents' perception on housing affordability was found to significantly differ across the age groups ( $F=2.313$ ,  $p\text{-value}=0.044$ ). Respondents aged between 31 and 50 were the majority who participated in the housing co-operative because they had stable income from employment. This argument was confirmed by documents review by the research indicated that most title deed owners were ranging from 30 to 50 years. Housing affordability was however not found to significantly associate with marital status ( $F=0.44$ ,  $p\text{-value}=0.777$ ). Contrary to Fakere and Ayoola (2018) found that married couples had positive effect on the level of participation in housing design.

Housing affordability significantly associated with the level of education ( $F=2.491$ ,  $p\text{-value}=0.031$ ) where respondents with higher education achievement tended to perceive housing more affordable. Hammad *et al.*, (2016) confirms that members with certificate and diploma level of education actively participated in the housing co-operatives. Employment status, civil servants tend to view housing more affordable compared to those employed in the private sector and the self-employed. This is because of civil servants are permanent and pensionable employees with high stability of the income. This argument was supported by one of the key informants

*.....I took a long-term loan to acquire my house which am serving for 84 months.....* “(Interview field data, Nairobi, August, 2018).”

The level of income also significantly associates with housing affordability. Affordability makes more sense when individual income is pooled together for common objective as supported by collective action theory. The mean-score of members perceived affordability significantly differ across the income levels



( $F=3.171$ ,  $p\text{-value}=0.014$ ). Members with higher incomes tended to view housing more affordable than those with low income.

**Table 3. 5 : Social-economic characteristics of the members and housing affordability**

		<b>Freq.</b>	<b>%</b>	<b>Mean</b>	<b>Std.</b>	<b>Df</b>	<b>t-stat</b>	<b>p-value</b>
<b>Gender</b>	<b>Male</b>	<b>178</b>	<b>49.31</b>	<b>2.799</b>	<b>0.031</b>	<b>359</b>	<b>-0.6626</b>	<b>0.508</b>
	<b>Female</b>	<b>183</b>	<b>50.69</b>	<b>2.827</b>	<b>0.030</b>			
Years of Membership	<2 years	42	11.63	2.037	0.444	5	2.423	0.035
	2-4 years	78	21.61	2.589	0.392	355		
	4-6 years	95	26.32	2.824	0.382			
	6-8 years	71	19.67	2.809	0.390			
	8-10 years	34	9.42	3.161	0.511			
	>10 years	41	11.36	3.470	0.360			
Age	18-20 years	21	5.82	2.754	0.383	5	2.313	0.044
	20-30	100	27.7	2.825	0.399	355		
	31-40	118	32.69	2.803	0.407			
	41-50	99	27.42	3.652	0.431			
	51-60	22	6.09	2.710	0.423			
	>60 years	1	0.28	2.396	0.000			
Status	Single	101	27.98	2.821	0.427	4	0.44	0.7771
	Married	216	59.83	2.820	0.413	356		
	Divorced	18	4.99	2.833	0.385			
	Windowed	26	7.2	2.715	0.351			
Education	None	2	0.55	2.806	0.179	5	2.491	0.031
	Primary	20	5.54	2.938	0.354	355		
	Secondary	32	8.86	2.785	0.441			
	Certificate	119	32.96	2.842	0.453			
	Diploma	148	41	2.788	0.406			
	Bachelors	40	11.08	2.780	0.287			
Employment Status	Civil servants	199	55.12	2.879	0.398	2	6.98	0.0011
	Private sector	108	29.92	2.767	0.364	358		
	Self-employed	54	14.96	2.664	0.492			
Income	Below Ksh.10000	25	0.07	2.379	0.181	4	3.171	0.014
	Ksh. 10,000 - 50,000	53	0.15	2.421	0.276	355		
	Ksh. 50,001- 100,000	214	0.6	2.608	0.477			
	Ksh. 100,001- 150,000	36	0.1	2.943	0.089			
	Above Ksh. 150,000	28	0.08	3.169	0.164			

### 3.5.4 Member participation and housing affordability

The 13 retained indicators of member participation were used for further analysis of the objective which was to assess the influence of member participation on housing affordability. Table 3.6 shows the descriptive statistics of the 13 retained member participation indicators. The respondents were asked to rate their levels of

participation basing on the indicators on an ordinal scale of 5-point Likert scale (1- Strongly Disagree, 2 – Disagree, 3 – Not Sure, 4 - Agree, and 5 - Strongly Agree). The descriptive statistics were calculated and presented considering the mean as the measure of central tendency and the standard deviation and the coefficient of variation (CV) as the measures of dispersion. The indicators had mean scores ranging between 2.942 and 3.770 of 5 which do not reflect very high levels of participation. The overall mean score of member participation was found to be 3.403 which show that the respondents on average had neutral levels of participation. A composite weighted index of member participation was calculated as from the ordinal scores of the indicator responses.

**Table 3. 6 : Members participation in the housing co-operatives Activities**

<b>Housing Co-operative Activities</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>CV</b>	<b>Weight</b>
Attending meetings	3.770	1.227	33%	1.108
Electing board of directors	3.759	1.123	30%	1.104
Payment of housing co-operative dues	3.720	1.170	31%	1.093
Raising funds for co-operative	3.576	1.243	35%	1.051
Recruitment of new members	3.546	1.215	34%	1.042
Participation in selection of project site	3.452	1.132	33%	1.014
Approval of annual budget	3.349	1.327	40%	0.984
Provision of building materials	3.316	1.202	36%	0.974
Participation in project appraisal	3.288	1.265	38%	0.966
Attending education and training	3.238	1.242	38%	0.951
Participation in project execution	3.211	1.206	38%	0.943
Participation in project maintenance	3.078	1.220	40%	0.904
Project planning and design	2.942	1.360	46%	0.864
<b>Overall Participation level</b>	<b>3.403</b>	<b>1.226</b>	<b>36%</b>	

### **3.5.5 Effect of members' participation on the housing affordability of housing co-operatives in Kenya**

A mixed effect regression model was fitted to assess the influence of member participation on housing affordability. The statistical model was not fitted directly from the indicators of housing affordability and member participation. The model was fitted using the composite indexes computed of housing affordability and member participation from their relative indicators in line with collective action theory. The mixed effect model was fitted considering the multilevel structure of the data with 2 levels of analysis. The mixed effect model adopts a hierarchical technique assessing fixed effects at level 1 (respondent/member level) and random effects at

level-2 (entity level) and was based on restricted maximum likelihood (REML) estimation technique. The hierarchical models were fitted to assess the influence of each dimension of the member participation as fixed effects within the housing co-operatives (at level-1) and as random covariates across housing co-operatives. The analysis involved fitting a multiple regression fixed effect model of member participation as model-1 (M1) for followed by a second model (M2) which included the random effect of member participation across the firms. Following the violation of the normality assumption determined when assessing the model assumptions, the mixed effect models fitted considered bootstrapping and reporting estimated with bootstrapped standard errors to cater for the violation.

On assessing the effect of member participation on housing affordability in housing co-operatives, the optimal model was found to be M1 with level-1 fixed effects and no level-2 random effects on affordability Table 3.7. The model showed a significant fixed effect component (Wald chi-square (1) = 5.23, p-value = 0.022) and significant random intercepts but no random slope. The fixed effect coefficients estimate showed that member participation has a significant influence on housing affordability which is fixed regardless of the entity ( $\beta = 0.065$ ,  $Z = 2.290$ , p-value = 0.022).

To assess the significance of the random effect of member participation across entities, a likelihood ratio test was carried out to compare M1 model with random intercepts and M2 with the random covariate of member participation. The LR test shows an insignificant change in the LR chi-square statistic (LR chi2 (1) = 1.30, p-value = 0.253). The p-value of the LR chi-square statistic is greater than 0.05 to imply an insignificant change in the model by including the random slopes (effects) of member participation in the housing co-operatives as a level-2 covariate. The Bayesian information criterion (BIC) statistics of M1 is less than that of M2 implying that the model (M1) without member participation as a random covariate is a better model compared to M2 and was thus that it was adopted as the optimal model. The equation generated by the optimal model fitted for this dimension is given by;

$$Y_{ij} = 2,590 + \gamma_{0j} + 0.065X_{ij} + \varepsilon_{ij}$$

$$\gamma_{0j} = \mu_{0j}$$

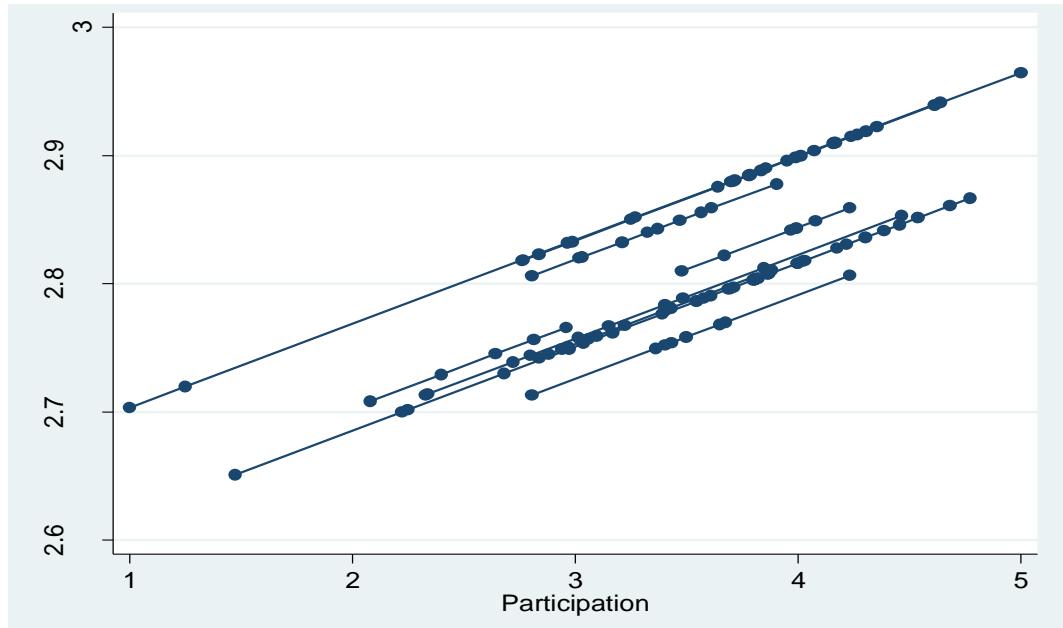
**Table 3. 7 : Relationship between member participation and housing affordability**

<b>Mixed-effects REML regression</b>				<b>Wald chi2(1)</b>		<b>=</b>	<b>5.23</b>		
<b>Log restricted-likelihood =-191.746</b>				<b>Prob &gt; chi2</b>		<b>=</b>	<b>0.022</b>		
<b>Affordability (Y)</b>	<b>Observed Coef.</b>	<b>Bootstrap Std. Err.</b>	<b>Z</b>	<b>P&gt;z</b>	<b>Normal-based [95% Conf. Interval]</b>				
Member participation levels (X1)	0.065	0.029	2.290	0.022	0.009	0.121			
_cons	2.590	0.103	25.190	0.000	2.388	2.791			
<b>Random-effects Parameters</b>				<b>Observed Estimate</b>		<b>Bootstrap Std. Err.</b>		<b>Normal-based [95% Conf. Interval]</b>	
Housing co-operative									
Sd (_cons)	0.006	0.002		0.003			0.012		
Sd (Residual)	0.160	0.011		0.139			0.184		
LR test vs. linear regression: chi2(2) = 2.73 Prob >= chibar2 = 0.049									
Level		ICC		Std. Err.		[95% Conf. Interval]			
Housing co-operative		0.039		0.015		0.018	0.081		
Likelihood-ratio test					LR chi2(1)	=	1.30		
(Assumption: M1 nested in M2)					Prob > chi2	=	0.253		
<b>Model</b>	<b>Obs</b>	<b>ll(null)</b>	<b>ll(model)</b>	<b>Df</b>	<b>AIC</b>	<b>BIC</b>			
M1	361	.	-191.7466	4	391.4932	407.0487			
M2	361	.	-191.0941	5	392.1882	411.6326			

The results of the analysis were used to test the study hypothesis. The rejection criterion was based on the p-value of the model. The significance of the fixed effect based on the p-value of the Wald Chi-square statistic and the significance of the p-value of the of the Likelihood ratio test (change in LR) due to random slopes of the member participation was used.

H<sub>0</sub>: Member participation has no significant effect on the housing affordability of housing co-operatives.

The p-value of the Wald chi-square statistic was less than 0.05. The null hypothesis was thus rejected and a conclusion drawn that member participation has a significant effect on the housing affordability of housing co-operatives. The effect is however fixed within all the housing co-operatives as implied by the insignificant of the random slope. The effect does not randomly change across housing co-operative.



**Figure 3. 1 : Mixed model of housing affordability against member participation**

Figure 3.1 shows the graphical presentation of the mixed effect model with fixed slopes of member participation and random intercepts with no random slopes. Different housing co-operatives have varying levels of housing affordability as displayed by different lines with different intercepts some higher than the other as stated by a member. All the lines representing different housing co-operatives are however parallel. This means that the effect of member participation at the member level (level 1) is fixed across all housing co-operatives. The effect of member participation on housing affordability for each housing co-operative is the slope of the line which is the change in y (housing affordability)/ change in x (member participation). The slope is fixed (constant at 0.065) for all the lines to imply the fixed effect of member participation across all housing co-operatives.

### 3.6 Conclusion and Recommendations

#### 3.6.1 Conclusion

The paper concludes by stating that member participation was average, meaning that affordability of housing co-operatives would have increased if the members actively participated in all the co-operative activities. Members participated in decision making process, attendance to co-operative meetings, share contributions., patronizing the co-operative activities and electing the board of directors. This participation had positive impact on the housing affordability. However, members

are encouraged to be more committed particularly when making decision that affect their housing business. The study also revealed that some of socioeconomic characteristics had a significant influence on the member participation in the housing co-operatives. The study showed that level of education, monthly income, years of memberships and employment status were significantly strong predictors of member participation. However, gender and marital status was not significant a predictor in this context.

### **3.6.2 Recommendations**

Since members' participation has a positive relationship with housing affordability, housing co-operative need to create conducive environment for members to participate actively. This will strengthen the housing co-operative to deliver affordable housing. The housing co-operative should ensure there is continuous provision of education and training to empower members in decision making. This will not only improve members' participation but also enhance the generation of ideas and business innovations that will boost affordable housing. In addition, the government through the state department of co-operatives should periodically review and audit all the registered housing co-operatives in order to comply with the provision of the co-operative society act. This action would compel housing co-operatives to pull-up their socks to avoid deregistration hence increased participation. Finally, the state department of co-operatives and co-operatives professionals should regularly organize workshops, seminars and symposia to enlighten the public and members about the importance of joining and participating in housing co-operatives activities.

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## CHAPTER FOUR

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### **Publishable Manuscript**

#### **4.0 Supportive Environment for Housing Cooperatives in the Context of the “Current Housing Affordability” In Nairobi City County, Kenya**

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### **4.1 Abstract**

Governments have recognized the contribution of housing co-operatives towards alleviating housing shortage while contributing to the social economic, cultural and political progression of their community and nation at large. This has prompted a need for deeper understanding of supportive environment for housing co-operatives in provision of affordable housing. Specifically, the paper aimed to determine the supportive environment for housing co-operatives and examine the relationship between supportive environment for housing co-operatives and housing affordability. The paper adopted cross sectional research design employing both quantitative and qualitative approach. Multistage sampling technique was used to select the 397 members from the 35 housing co-operatives selected. The collected data were analyzed with both inferential and descriptive statistics, the descriptive statistics include frequency, simple percentage and mean, while inferential statistics used multiple regression analysis. Test of hypotheses were analyzed through mixed effect model and correlation analysis. The finding reveals that policy and legislative with P-value of 0.016 and collaboration and partnerships with P-value of 0.010 had a significant effect on housing affordability. While support services with P-value of 0.637 which is greater than 0.05 had insignificant effect on housing affordability. The study concluded that it is ultimately the sole responsibility of government to create conducive environment for housing co-operatives to thrive, however, not to the extent of interfering with its independence. The study recommends that the state department of co-operatives should create housing cooperative policy that would address the unique challenges facing the members of housing cooperatives rather than general housing policy.

**Key words: Supportive environment, housing affordability, cooperatives.**

## 4.2 Introduction

Across the world; most governments have withdrawal from direct supply of affordable housing. As a result, the inability of private sector to provide sufficient housing units to low-income groups has led to rediscovery of housing co-operatives as potential strategy to counter ever-increasing demand for affordable housing (Barenstein, *et al.*, 2021; Baiges *et al.*, 2020; Madden and Marcuse, 2016; Duyn Barenstein and Sanjinés, 2018) stated that housing co-operatives globally are known as alternative housing model for provision of decent and affordable housing. UN-Habitat (2019) opined that adequate housing is a basic human need and is part and parcel of everyone's right for adequate standard of living. Despite its importance, it is estimated that over 1.6 billion people globally live in inadequate housing while 2million people every year are forcibly evicted, and 150 million people are homeless (UN-Habitat, 2020).

The housing co-operatives can be a solution in provision of affordable housing as well as creating economic incentives and social opportunities for its members (Lipej and Turel, 2018). The International Co-operative Alliance (2012) defined housing co-operative as housing model mutually owned and democratically controlled by its members for the purpose of provision of housing needs at affordable rate. According to Czischke, (2018), the bottom-up approach for innovative housing projects in most European countries were implemented by housing co-operatives. In addition, housing co-operatives achieved social goals such as meeting needs of people with special needs including the elderly, single parents, migrants and refugees (Lang *et al.*, 2020). Further, co-operatives housing is regarded as important model in retaining long-term housing affordability whereby their prices are not affected by market forces (Malatest and Associates, 2018).

The idea of the enabling approach towards supply of affordable housing has been adopted by a number of governments across the world including German, Austria, France and Netherlands among others (Gruber and Lang, 2018). According to Hassan (2012), it is not government's job to deliver housing but to provide conducive environment at which housing market can work effectively. Groeneveld (2016) defined enabling environment for co-operatives as the degree to which nations, governments and societies support and foster establishment and development of co-operative organisations in line with the co-operative principles. Koh *et al.*, (2014)

surveyed 37 businesses serving the poor in Asia, Africa and Latin America and found that at least half of them felt constrained by the following three business environment issues: Inhibitory laws, regulations and procedures (65%); absent/ ineffective standards (63%); inhibitory taxes and subsidies (49 %). Gruber and Lang, (2018) and Lang and Stoeger (2018) conducted a survey in five countries (France, the Netherlands, Germany, Austria and the UK) and also found that policies, regulation and practices were given much emphasizes in provision of affordable housing.

Ganapati (2014) reported that government support was critical resource in terms of access to land and subsidized financing boosted the formation of housing co-operatives in Senegal. Nguluma (2016) observed that financing was a major challenge facing housing co-operatives in Tanzania as a result of collapse of Tanzania Housing Bank (THB) in 1995. According to Nguluma (2016), inappropriate housing policies affected the performance of housing co-operatives. Marunga and Mberengwa (2014) cited that minimum success of housing co-operatives in Zimbabwe was contributed by high cost of on-site and offsite infrastructure, high cost of land and mismanagement of funds by co-operative executive officials. In Nigeria, Durodola *et al.*, (2016) found that lack of or inadequate on-site infrastructure and financing are among the critical resources hindered success of the housing co-operatives.

The Constitution of Kenya (2010) under article 43 (b) clearly provides for access to adequate housing with reasonable standards of sanitation as a social and economic right to all Kenyans. Housing plays a central role in the social life of people and is a fundamental physiological need required for human survival (McLeod, 2018). Housing provides an enabling environment for nurturing families, promotes health by providing a place for relaxation and protection from adverse environmental conditions, provides security for individuals and their property and offers comfort, freedom, peace of mind and recognition to individuals. As such, housing is multidiscipline cutting cross several sectors makes it critical for growth and development.

The government of Kenya has made remarkable progress in addressing housing shortage in various ways including establishment of National Housing Corporation (NHC) to promote delivery of decent housing through schemes such as tenant purchase, outright sale, rural and peri-urban housing loan and rental housing. Also,

the government established National Construction Authority (NCA), National Building Inspectorate and various educational institutions to support housing sector through accreditation and licensing of competent housing developers and contractors to enhance quality in housing construction. However, due to widening the gap between the supply and demand units, there is need for more supportive services, relevant policies and legislative, collaboration and partnerships between the government and private sector to realise this dream of affordable housing (Mose *et al.*, 2018).

The inability of the private sector to provide enough affordable housing units particularly low -middle income groups led to rediscovery of housing co-operative as alternative housing model (Cabr e and Andr es.2018). Despite its long history, housing co-operatives has rarely gone beyond their niche in provision of affordable housing. In few instances where housing co-operative has expanded beyond their margins, is because of government support and recognition as key enabling factor. According to Ferreri and Vidal (2022), appropriate legal and policy mechanisms promote housing co-operatives in accessing affordable housing. On the same vein, Czischke (2018) found that collaboration and partnerships with key stakeholders in housing sector facilitated access to key resources and professional expertise. Against this backdrop, the paper examined the enabling environment under which housing co-operatives can be facilitated to provide affordable housing.

A number of scholars, Kieti *et al.*, 2020; Mwau *et al.*, 2019; Gardner *et al.*, 2019; Petrus and Newman 2019; Mose *et al.*, 2018 observed that affordable housing is affected by a number of factors such as inefficient system of land registration, unaffordable finance, limited supply of developable land, speculation of prices of land, lack of physical and social infrastructure and inappropriate policy and regulation. Other studies including Voellmecke (2011) observed that women in housing co-operatives have been excluded from participating in provision of affordable housing. While Onchieku and Ragui (2019) investigated the importance of strategic leadership on performance of housing co-operative societies in Nairobi city county, Kenya. Further, Shihembetsa (2018) investigated the structural ability and capacity of National Co-operative Housing Union (NACHU) for implementation of housing projects for low-income households in Kenya.



Housing co-operatives in Kenya have not been able to produce enough housing units to their members and to the general public due to stringent financing framework, inappropriate policies and legislative framework that has led to poor services delivery (IIED, 2019; Feather and Meme, 2018). Therefore, this paper considered sector-based perspective as important aspect when examining enabling environment for housing co-operatives. Also, the study employed combination of indicators which had not been studied together in one study by previous studies. Lastly, the study employed mixed effect model which has not been used by previous scholars on the sector. This has prompted a need for deeper understanding of supportive environment for housing co-operatives in provision of affordable housing. Specific objectives were: i) to determine the supportive environment for housing co-operatives, ii) to examine the relationship between supportive environment for housing co-operatives and housing affordability. Supportive environment was measured by the following indicators policy and legislative, collaboration and partnership and support services.

H<sub>0</sub>: Supportive environment for housing co-operative has no significant effect on the housing affordability.

### **4.3 Theoretical Underpinnings**

The study was guided by a Resource Dependence Theory as pioneered by Pfeffer and Salancik (1978). The theory is based on critical and important resources that influence the diverse actions of the organisation. Resources generally include various assets, capabilities, organizational processes, information and knowledge that contribute to improved efficiency and effectiveness. According to Seo, (2011), dependencies of resources created ascertain level of risks and uncertainty that affected the organisational efficiency and effectiveness. However, Pfeffer and Salancik, (1978) found that collaboration helps to reduce uncertainty and facilitates access to critical resources. However, since resource dependence theory helps to theoretically diagnose the sources of power and dependence and predicting when and in what direction organizations are likely to respond, it still yields great insights into organizational behaviour (Davis and Cobb, 2010).

The resource dependency theory has been described as a co-optation model of housing co-operatives which views housing co-operatives as interdependent with their environment (Conforth 2004). Housing co-operatives as an organisation is

endowed with variety of resources coming from their members such as human, physical and social resources that are crucial to their survival. Mudambi and Pedersen (2007) opined that power is held by members of housing co-operatives and exercised during annual general meeting in making strategic decision concerning their co-operative such decision include collaboration and partnerships with other organisation with an aim of supporting housing co-operatives activities (Mullins and Moore, 2018; and Knies *et al.*, 2016). Existences of laws and regulations in housing co-operatives brings sanity to the whole process of housing development starting from purchase of land up to housing constructions (Crabtree *et al.*, 2019). As noted by Davis and Cobb, (2010) public authorities support housing co-operatives in providing necessary resources for common good. Similar argument was shared by Van Bortel *et al.*, (2018) that government support mechanisms such as subsidies, asset transfer and tax incentives are crucial resources for attainment of affordable housing.

#### **4.4 Methodology**

The study was conducted in Nairobi City County because it hosts the highest number of housing co-operatives (115) and with 500,000 memberships compared to other counties (state department of co-operatives 2020). Also, Nairobi City County has highest population compared to other counties with highest number of people without adequate housing (IIED, 2019) and is the largest and fastest growing city in Kenya (Mutisya, 2015). Thus, it provides ground for collecting valid and reliable data about the effect of supportive environment for housing co-operatives on housing affordability. The study adopted a mixed-methods methodology as it allows the triangulation of quantitative and qualitative approaches in the collection, analysis and presentation data (Van Wyk, 2009; Ong, 2003). The cross-sectional research design was adopted in this paper to collect data from members of housing co-operatives in Nairobi City County at one point in time which considered to be useful where resources are imitated (Jogulu and Pansiri, 2011).

The target population in this paper consisted of members of housing co-operatives in Nairobi City County. A multistage sampling technique was used to select 35 housing co-operatives from 115 as sample. 35 housing co-operatives were selected based on consecutive filing of returns for five years (2012 to 2017). Also, multistage sampling technique was used to select the 397 members from the 35 housing co-operatives

selected. The number of members per housing co-operative selected was based on the proportionate distribution of with probability proportional to the size of co-operative (membership). Simple random sampling was then used to select the members to be included in the sample from the member's register of each housing co-operative. The sample size of 397 members was determined based on the sampling formula for a finite population given by;

$n = N / (1 + (N \times e^2))$  where  $n$  is the sample size,  $N$  is the population size and  $e$  the permissible error. This formula was given provided by Yamane (1967) as a simplified sample size computation for a finite population.

The calculation as follows:

$$n = 48,803 / (1 + (48,803 \times 0.05^2))$$

$$n = 48,803 / 123.0075$$

$$n = 397$$

A structured questionnaire was designed to collect information about the effect of a supportive environment for housing cooperatives on housing affordability. A total of 397 copies of the questionnaire were administered to the members of 35 housing cooperatives. In addition, qualitative data were collected using key informant interview guide and documentary review. A total of 10 KIs were selected based on knowledge, experience, and position they held in their respective organizations include a deputy commissioner for the state department of cooperatives and Chairpersons and Chief Executive Officers of selected housing co-operatives. Data was recorded using field notes and electronic audio devices and thereafter transcribed, categorized, coded, and grouped into themes for analysis.

Data was also assessed for both internal consistency and validity. A Cronbach's alpha ( $\alpha$ ) was used as an internal consistency measure where a value of 0.7 is the recommended and used as a cut-off for reliabilities (Fraenkel and Wallen, 2000; Sekaran, 2010). The study constructs (Policy and Legislation, Support Services and Collaboration and partnership) yielded Cronbach's alpha statistics greater than 0.7 and thus considered to be reliable. For validity, construct validity was assessed for both constructs by testing for convergent and discriminant validity to determine that the observed indicators measuring the same construct have high inter-correlations

amongst themselves and no correlations with indicators of other constructs (Kline, 2011). Reliability and validity of the study construct data collection instrument showed adequately reliable and valid measurements of the constructs by the indicators that were retained. Validity was checked by assessing construct validity as shown in table 4.6. The validity results were based on confirmatory factor analysis which showed that all the 12 indicators that were proposed by the theoretical model loaded the constructs above 0.4 and were retained for the construct on supportive environment. On application of factor analysis, it is recommended that indicators loading below 0.40 should be removed (Hamid, Sami & Sidek, 2017). For the construct on Housing affordability 8 out of the 26 indicators had factor loading less than 0.4 on the construct and were therefore expunge thus retaining 18 indicators. Supportive environment was assessed considered to have 3 sub dimensions Legislative and policy framework, Government support and Collaboration and partnership support thus validity was assessed for each sub dimension as shown in Table 4.7 which shows the factor loadings of each construct. The retained factor loadings reflected adequate convergent validity based on the average variances extracted (AVEs) of the constructs which are above 0.5. The results on construct were based on recommendations for convergent and discriminant validity results as recommended by Hamid, Sami and Sidek (2017), who quoted the Fornell-Larcker construct validity assessment techniques. Discriminant validity of the instrument was reflected by the squared multiple correlations of the constructs which are less than the AVEs. Reliability was checked by assessing the internal consistency of the constructs as measured by the indicators using Cronbach's alpha. As shown in the table, both constructs have alpha values greater than 0.7 implying adequate reliability. Further analysis was based on the 18 retained indicators of housing affordability and the 12 indicators retained on the dimensions of Supportive environment

**Table 4. 1 : Reliability and Validity Supportive Environment and Affordability**

	AVE	Squared correlations	N0. Of items	KMO & Bartlett's test	Cronbach's Alpha All items
<b><u>All indicators</u></b>					
Policy and Legislation	0.512	0.356	4	KMO=0.739, Chi(6)= 87.722, p-value=0.000	0.879
Support Services	0.513	0.254	4	KMO=0.731, Chi(6)= 102.134, p-value=0.000	0.884
Collaboration and Partnership	0.513	0.254	4	KMO=0.733, Chi(10)= 98.911, p-value=0.000	0.879
Housing affordability	0.513	0.334	26	KMO=0.783, Chi(325)=4558.803, p-value=0.000	0.862
<b><u>Retained indicators</u></b>					
Policy and Legislation	0.512	0.356	4	KMO=0.739, Chi(6)= 87.722, p-value=0.000	0.879
Support Services	0.513	0.254	4	KMO=0.731, Chi(6)= 102.134, p-value=0.000	0.884
Collaboration and Partnership	0.513	0.254	4	KMO=0.733, Chi(10)= 98.911, p-value=0.000	0.879
Housing affordability	0.540	0.285	18	KMO=0.861, Chi(153)=3304.803, p-value=0.000	0.884

**Table 4. 2 : Factor loading for Supportive Environment**

Indicator	Factor Loadings
<b>Policy and Legislation</b>	
1 Development of financial policy for housing co-operatives	0.575
2 Formation of national housing co-operative policy	0.483
3 Digitalization of land systems	0.578
4 Provision of tax discounts for co-operative housing	0.682
<b>Support Services</b>	
5 Strengthen the Apex body	0.406
6 Publicity of housing co-operatives	0.623
7 Development of policy for people with special needs	0.661
8 Efficient registration of housing co-operatives	0.541
<b>Collaboration and Partnership</b>	
9 Provision better infrastructure support and services for co-operatives	0.622
10 Provision of technical and financial Aid	0.442
11 Collaboration with Kenya mortgage refinance company	0.611
12 Provision of public land for co-operative housing development	0.665

Data analysis were based on Restricted Maximum Likelihood (REML) model fitted for the data collected. Both data were analysed descriptively and influentially. Factor

analysis was used for dimension reduction of the independent variable (supportive environment) into three sub dimension (legislative and policy, collaboration and partnership and support services) measurement of the dependent variable (housing affordability) sought to determine the effect of supportive environment for housing co-operatives on proposed factors of affordability that were retained in the pilot study. Respondents ranked the housing affordability (dependent variable) criteria in relation to their housing co-operatives on an ordinal scale of importance ranging from 1-not important at all, to 5-most important. The indicators were reduced to a single overall index of housing affordability which was calculated as a weighted average of the ordinal scores from the indicator responses of the dependent variable. The weights for the indicators were determined as proposed by Mulliner and Maliene (2015) by dividing the mean score by the sum of mean scores and multiplying by 100 as given by the equation below

$$\omega_i = \frac{\bar{X}_i}{\sum_{i=1}^{18} \bar{X}_i} \times 100$$

Where ;

$\omega_i$  is the weight of indicator i

$\bar{X}_i$  is the mean of indicator i

Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). The interest is to assess the significance of supportive environment (Independent variable) towards extension of affordable housing (Dependent variable) by housing co-operatives in Kenya. The random-intercept model with only one fixed effect predictor at the member level would be specified at level 1 and level 2 in hierarchical form separately as;

The second equation can be substituted into the 1st equation to yield a formulation given by;

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1,ij} + \beta_2 X_{2,ij} + \beta_3 X_{3,ij} + \mu_{1j} X_{1ij} + \mu_{2j} X_{2,ij} + \mu_{3j} X_{3,ij} + \mu_{0j} + \varepsilon_{ij}$$

In the equations:

$Y_{ij}$  is the level of housing affordability (dependent variable) as viewed by respondent i nested from housing co-operative j;

$X_{1,ij}$  is the Legislative and policy framework (Independent variable) as viewed by member i nested in co-operative j;

$X_{2,ij}$  is the Government support (Independent variable) as viewed by member  $i$  nested in co-operative  $j$ ;

$X_{3,ij}$  is the Collaboration and Partnership (Independent variable) as viewed by member  $i$  nested in co-operative  $j$ ;

$\beta_1$  to  $\beta_6$  are the fixed effect estimates coefficient of the predictors (level-1 effects)

$\gamma_{0j}$  is the intercept which has a separate specification equation due to the 2 levels assumed to cause variation in housing affordability. In the intercept equation;

$\beta_{0j}$  is the level 1 intercept which is the average housing affordability for the entire population; and

$\mu_{0j}$  is the county specific effect (cluster specific) random intercept.

$\mu_{1j}$  is the random slope (random coefficient) of independent variables at co-operative  $j$  (level-2 coefficients of  $X$ )

$\varepsilon_{ij}$  is the overall error term

The mixed effect models fitted were assessed for the assumptions of linearity, normality, multi collinearity and homoscedasticity. The models fitted to assess the study hypothesis considered multi-level statistical analysis techniques. Assessment of assumptions of mixed effect models was carried out based on exploratory graphical analysis unlike other linear regression modelling techniques that can be assessed using classical tests. Due to violation assumption of normality, the mixed effect REML model applied bootstrapping standard errors to cater for the violation of the assumption.

## **4.5 Findings and Discussion**

### **4.5.1 Supportive environment for housing co-operatives**

The paper focused on the effect of supportive environment for housing co-operatives. Supportive environment was classified into three sub-dimensions (policy and legislation, support services and collaboration and partnership). The respondents were asked to rate their levels of agreement with 12 statements regarding supportive environment for housing co-operatives on an ordinal scale with categories from 1-strong disagreement, 2-disagreement, 3-neutral and 4-agreement and 5-strong agreement. The descriptive statistics were calculated and presented considering the mean as the measure of central tendency and the standard deviation and the coefficient of variation (CV) as the measures of dispersion as shown the Table 4.3.

**Table 4. 3 : Supportive environment for housing co-operatives**

<b>Variable</b>	<b>Mean</b>	<b>Std.</b>	<b>CV</b>
<b>Policy and Legislation</b>			
Development of financial policy for housing co-operatives	4.202	0.847	20%
Formation of national housing co-operative policy	4.150	0.913	22%
Digitalization of land systems	4.097	0.983	24%
Provision of tax discounts for co-operative housing	4.044	0.868	21%
<b>Support Services</b>			
Strengthen the Apex body	4.064	0.897	22%
Publicity of housing co-operatives	4.061	0.870	21%
Development of policy for people with special needs	4.047	0.901	22%
Efficient registration of housing co-operatives	3.867	1.013	26%
<b>Collaboration and Partnership</b>			
Provision better infrastructure support and services for co-operatives	4.141	0.872	21%
Provision of technical and financial Aid	4.100	0.970	24%
Collaboration with Kenya mortgage refinance company	4.094	0.899	22%
Provision of public land for co-operative housing development	4.089	0.899	22%

The result in Table 4.3 shows that policy and legislation had four indicators :- development of financial policy for housing co-operatives with a mean, standard deviation and coefficient of variation of 4.202,0.847 and 20% respectively, formation of national housing co-operative policy with a mean, standard deviation and coefficient of variation of 4.150,0.913, and 22% respectively, digitalization of land systems with a mean, standard deviation and coefficient of variation of 4.097,0.983 and 24% respectively and provision of tax discounts for co-operative housing with a mean, standard deviation and coefficient of variation of 4.044 0.868,and 21% respectively. The results show that the respondents were on average in agreement with the statements which show that legislative and policy framework play critical role in facilitating provision of affordable housing through housing co-operatives. The result would have been better if both national and county governments agree to harmonize all legislatives and policies that affect the housing sector.

The descriptive statistics of the statements of supportive services offered to the housing co-operatives are: -. Strengthen the Apex body with a mean, standard deviation and coefficient of variation of 4.064 0.897 and 22% respectively , publicity of housing co-operatives with a mean, standard deviation and coefficient of variation of 4.061,0.870 and 21% respectively, development of policy for people with special needs with a mean, standard deviation and coefficient of variation of 4.047,0.901, and 22% respectively and efficient registration of housing co-operatives with a mean, standard deviation and coefficient of variation of 3.867 1.013 and 26% respectively.



The results show the mean ranging from 3.867 to 4.064 implying that respondents were in agreement that support services influence the provision of affordable housing through housing co-operatives.

The descriptive statistics of the statements of collaboration and partnership were:- provision better infrastructure support and services for co-operatives with a mean, standard deviation and coefficient of variation of 4.141, 0.872 and 21%, respectively, provision of technical and financial Aid with a mean, standard deviation and coefficient of variation of 4.100, 0.970, 24% respectively, collaboration with Kenya mortgage refinance company with a mean, standard deviation and coefficient of variation of 4.094, 0.899 and 22% respectively and provision of public land for co-operative housing development with a mean, standard deviation and coefficient of variation of 4.089, 0.899 and 22% respectively. Implying that collaboration and partnership help the housing co-operatives to provide affordable housing for their members.

#### **4.5.2 The influence of supportive environment on housing affordability**

Mixed effect regression model was fitted to assess the influence of supportive environment dimensions as independent variables on housing affordability. The data collected was cross-sectional a multilevel structure considering 2 levels of analysis with the cooperative members as the level 1 unit of analysis nested in the groups (housing cooperatives) as the level 2 units of analysis. Multi-level structures reflect possible variations on both levels. Variations at level 1 are due to possible different perceptions of respondents within a belonging to a common housing co-operative who are otherwise considered homogeneous while variation at level 2 is due to differences across the entities (housing cooperatives). The variations at both levels could also result in varying effects due to the different levels of the multiple levels. Mixed effect regression models were therefore fitted to assess the effect of supportive environment at both levels which adopt a hierarchical technique assessing fixed effects at level 1 and random effects at level-2. Multilevel analysis has been widely adopted in social studies and psychology (Woltman *et al.*, 2012), land uses and housing (Sang-Chul *et al.* 2012), commercial aviation Boedeker, (2017) and in medical Keon-Hyung *et al.*, (2013). Restricted maximum likelihood mixed effect models were adopted in the study.

Due to violation assumption of normality, the mixed effect REML model applied bootstrapped standard errors to cater for the violations. Hierarchical models were fitted to assess the influence of each dimension of the supportive environment as fixed effects within the housing cooperatives (at level-1) and as random covariates across housing cooperatives. The analysis involved fitting a multiple regression fixed effect model of supportive environment as model-1 (M1) for followed by a second model (M2) which included the random effect of supportive environment dimensions across the firms.

On assessing the effect of supportive environment on housing affordability in housing cooperatives, the optimal model was found to be M1 with level-1 fixed effects and no level-2 random effects on affordability Table 4.9. The model showed a significant fixed effect component (Wald chi-square (3) = 40.04, p-value = 0.002) and significant random intercepts but no random slope. The specific coefficients of each dimension showed that only legislative and policy frameworks ( $\beta = 0.086$ ,  $Z = 2.400$ , p-value = 0.016) and collaboration and partnership ( $\beta = 0.123$ ,  $Z = 2.570$ , p-value = 0.010) with p-values less than 0.05 had significant fixed effects on housing affordability that exists regardless of the entity. Support services were found to have no significant fixed effect on housing affordability ( $\beta = 0.019$ ,  $Z = 0.470$ , p-value = 0.637). The p-value of the fixed effect coefficient of support services is shown the p-value which is greater than 0.05. Suter (2016) conducted multilevel analysis with six management factors in the housing co-operative, the age of the cooperative was found to have negative impact on the member values however, size (number of flats) and level of self-government had positive impact on members' values.

To assess the significance of the random effect of supportive environment dimensions across entities, a likelihood ratio test was carried out to compare M1 model with random intercepts and M2 with the random covariate of the supportive environment. The LR test shows an insignificant change in the LR chi-square statistic (LR chi2 (1) = 0.000, p-value = 1.00). The p-value of the LR chi-square statistic is greater than 0.05 to imply an insignificant change in the model by including the random slopes (effects) of supportive environment dimensions in the housing cooperatives as a level-2 covariate. The Bayesian information criterion (BIC) statistics of M1 is less than that of M2 implying that the model (M1) without supportive environment as a random covariate is a better model compared to M2 and was thus that it was adopted as the

optimal model. The equation generated by the optimal model fitted for this dimension is given by;

$$Y_{ij} = 1.886 + \gamma_{0j} + 0.086X_{1,ij} + 0.123X_{2,ij} + \varepsilon_{ij}$$

$$\gamma_{0j} = \mu_{0j}$$

**Table 4. 4 : Regression model of supportive environment and housing affordability**

<b>Mixed-effects REML regression</b>		<b>Number of obs</b>	=	<b>361</b>		
Group variable: housing coop		Number of groups	=	35		
		Obs per group: min	=	5		
		Avg	=	10.6		
		Max	=	36		
Mixed-effects REML regression		Wald chi2(3)	=	40.04		
Log restricted-likelihood = 179.58341		Prob > chi2	=	0.000		
<b>Affordability (Y)</b>	<b>Observed</b>	<b>Bootstrap</b>	<b>Normal-based</b>			
	<b>Coef.</b>	<b>Std. Err.</b>	<b>Z</b>	<b>P&gt;z</b>	<b>[95% Conf. Interval]</b>	
Policy and Legislation (X <sub>1</sub> )	0.086	0.036	2.400	0.016	0.016 0.155	
Support Services (X <sub>2</sub> )	0.019	0.040	0.470	0.637	-0.059 0.097	
Collaboration and Partnership (X <sub>3</sub> )	0.123	0.048	2.570	0.010	0.029 0.216	
_cons	1.886	0.152	12.400	0.000	1.588 2.184	
<b>Random-effects Parameters</b>	<b>Observed</b>	<b>Bootstrap</b>	<b>Normal-based</b>			
	<b>Estimate</b>	<b>Std. Err.</b>	<b>[95% Conf. Interval]</b>			
Housing cooperative						
sd(_cons)	0.007	0.003		0.003	0.016	
sd(Residual)	0.146	0.015		0.119	0.179	
LR test vs. linear regression: chibar2(01) = 3.35 Prob >= chibar2 = 0.0335						
Level	ICC	Std. Err.	[95% Conf.	Interval]		
Housing cooperative	0.045	0.019	0.020	0.100		
Likelihood-ratio test		LR chi2(3)	=	0.000		
(Assumption: M1 nested in M2)		Prob > chi2	=	1.000		
<b>Model</b>	<b>Obs</b>	<b>ll(null)</b>	<b>ll(model)</b>	<b>Df</b>	<b>AIC</b>	<b>BIC</b>
M1	361	.	-179.5834	6	371.167	394.500
M2	361	.	-179.5834	9	377.167	412.167

The results of the analysis were used to test the study hypothesis. The rejection criteria was based on the p-value of the model. The significance of the fixed effect based on the p-value of the Wald Chi-square statistic and the significance of the p-value of the of the Likelihood ratio test (change in LR) due to random slopes of the supportive environment dimensions were used.

H<sub>0</sub>: Supportive environment for housing co-operatives has no significant effect on the housing affordability.

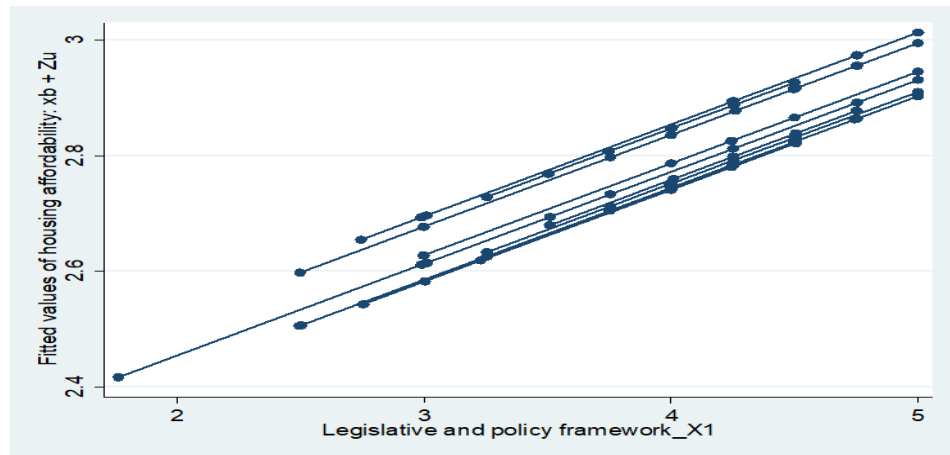
The p-value of the Wald chi-square statistic was less than 0.05. The null hypothesis was thus rejected and a conclusion drawn that supportive environment has a significant effect on the housing affordability of housing co-operatives. The effect is however fixed within all the housing co-operatives as implied by the insignificant of the random slope. The effect does not randomly change across housing co-operative.

The fixed effect of supportive environment was also found to only be due to legislative and policy frameworks and due to collaboration and partnership and the dimensions. However, support services were found to have no effect on housing affordability.

Figure 4.7 shows the graphical presentation of the mixed effect model with fixed slopes of legislative and policy frameworks and random intercepts. The fixed effect of legislative and policy frameworks is shown by the fixed slopes across the different housing co-operatives that are displayed by parallel lines to imply a fixed and constant slope. The random intercepts are shown by varying lines to represent the different levels of housing affordability as viewed by members of different housing co-operatives. This implies that not all housing co-operatives are at equal levels of housing affordability as members of some housing co-operatives perceive higher affordability of their co-operative compared to the views by members of other housing co-operatives. But the effect to which legislative and policy frameworks support affect housing affordability within the housing co-operatives is constant (fixed) across in the housing co-operatives. Adeler (2014) argues that public policy and legislation have significant influence in fostering or hindering effective development of co-operative organizations. This argument was also supported by Barenstein *et al.* (2021) who found that state policies and political institutions created enabling environment for housing co-operatives in provision of affordable housing. This sentiment was supported by the general manager of Nairobi Teachers Housing Co-operative as KI stated that:

*“... proper legislative framework and policy for housing sector would reduce the agony people go through in the name of acquiring affordable home....”* (Interview field data, Nairobi, August 2018).

There is a lot of gaps in legislative and policy framework for housing sector which call for urgent attention to avoid losses. Housing policy accessed by the researcher from Urithi housing co-operatives did not cover comprehensively issues affecting members in the process of acquiring of affordable home.

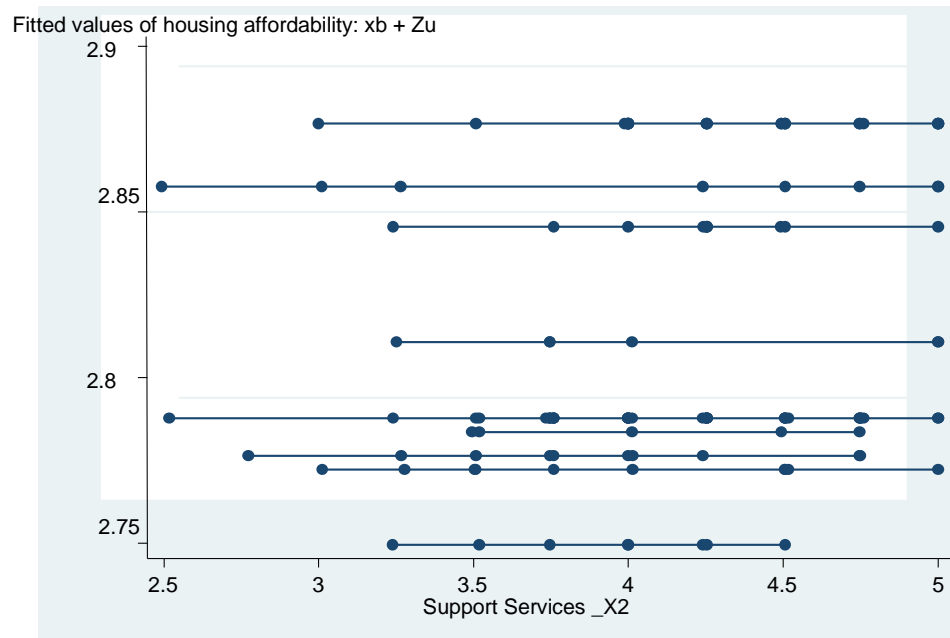


**Figure 4. 1 : Mixed model of housing affordability against Policy and legislations.**

Figure 4.1 shows the graphical presentation of the mixed effect model displaying no fixed slopes support services which was found to have neither a fixed nor a random effect on housing affordability. The figure thus only shows that by changing the level of support services, the only changes in housing affordability is due to the varying random intercepts from one housing co-operative to another with no changes (zero slopes) within each housing co-operative. The insignificant fixed effect of support services within each housing co-operative is shown by the horizontal lines across the different housing co-operatives that are displayed by parallel lines to imply that the effect within the housing co-operatives is zero and is fixed in all housing co-operatives. The random intercepts are shown by varying lines to represent the different levels of housing affordability as viewed by members of different housing co-operatives. But the effect of support services on housing affordability within the housing co-operatives is insignificant (zero) and constant (fixed) in all the housing cooperatives. The chairman of National Co-operative Housing Union (NACHU) as key informant gave contrary opinion to the findings that:

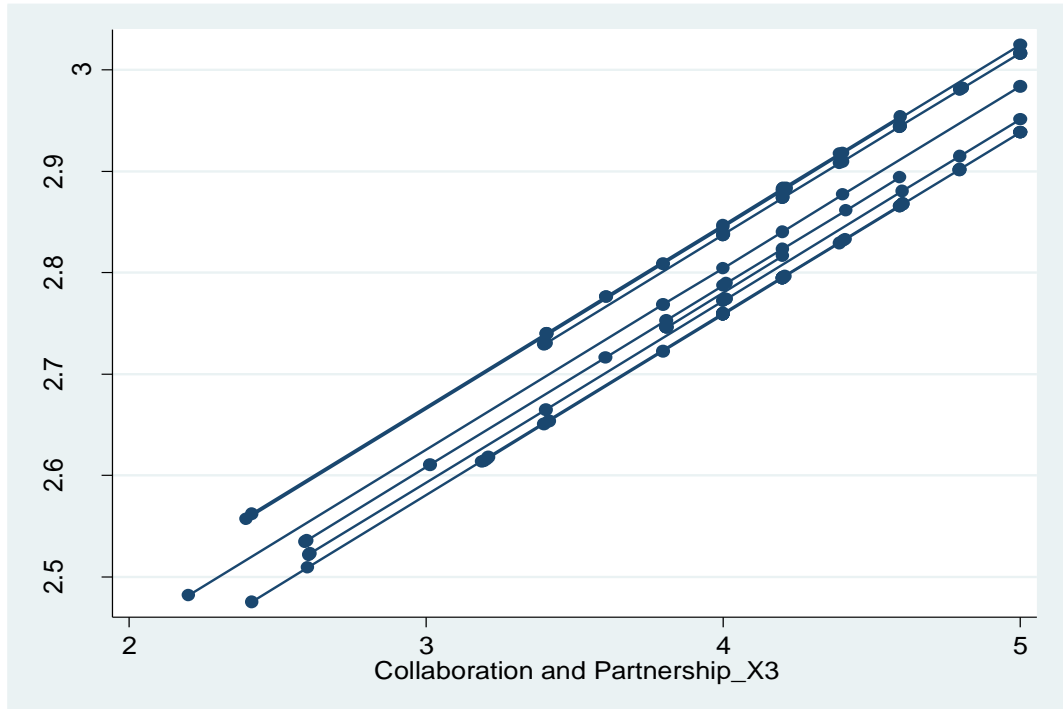
*“..... an umbrella body of housing co-operatives should be in forefront in designing strategies that can be used to promote housing cooperative financing models amongst members.....”* (Interview field data, Nairobi, August, 2018).

The main argument for this key informant was that support services are critical for prosperity and growth of housing co-operatives. Studies conducted by Steinman (2020) noted that support services for housing co-operatives facilitated regional, national and global network, training and registration of new co-operatives.



**Figure 4. 2 : Mixed model of housing affordability against support services**

Figure 4.2 shows the graphical presentation of the mixed effect model with fixed slopes of collaboration and partnership and random intercepts. The fixed effect of collaboration and partnership is shown by the fixed slopes across the different housing co-operatives that are displayed by parallel lines to imply a fixed and constant slope. The random intercepts are shown by varying lines to represent the different levels of housing affordability as viewed by members of different housing co-operatives. But the effect to which collaboration and partnership affect housing affordability within the housing co-operatives is constant (fixed) across in the housing co-operatives. Heinrich-Fernandes (2016) observed that collaboration and partnership facilitated provision of affordable finance, infrastructure and effective policies in the housing co-operatives. Czischke *et al.* (2020) reported that collaboration and partnership reduced the total cost of affordable housing. However, Mullins and Moore (2018) argue that collaboration and partnership with external partners in provision of resources and expertise might interfere with independence of housing co-operatives. In addition, contract documents accessed by the researcher showed that Shirika housing co-operatives was in collaboration and partnerships with organisations.



**Figure 4. 3 : Mixed Model of housing affordability against collaboration and partnership**

## **4.6 Conclusions and Recommendations**

### **4.6.1 Conclusions**

The research findings suggest that housing co-operative continue to be important actors in provision of affordable housing. In order to thrive and maintain significant contribution in the provision affordable housing, it requires government support but not to the extent that might jeopardize their independence and autonomy. There are many ways of creating enabling environment for housing co-operatives to flourish. Establishment legislatives and policies, support services and collaboration and partnership were found critical for continue growing of housing co-operatives. However, support services were found insignificant in determining housing affordability. Supportive environment for housing co-operatives cannot be achieved by quick fixes or simple formulas. Ultimately is sole responsibility of any government to create conducive environment for business to thrive including housing co-operatives. Establishment of legislative and policies, support services, and collaboration and partnership is not enough, the crucial condition is regular actualization and implementation of very purpose of housing co-operatives by all the stakeholders.

#### **4.6.2 Recommendations**

The existence of supportive environment for housing co-operatives is considered essential to stimulate economic growth and development in housing sector. First, the National government and county governments should harmonize existing laws governing housing sector and housing delivery especially housing infrastructure to facilitate more cost-effective housing development. Second, National Co-operative Housing Union (NACHU) as apex organization for housing co-operatives need to work with government agencies to create housing cooperative policy that would address the unique challenges facing the members of housing cooperatives in terms housing cooperative financing models on communal ownership and management which is missing in the national housing policy of 2017. Third, the National government should enhance regular monitoring and supervision of all real estate companies and housing providers by incorporating stringent penalties for culprits who defrauds people's funds in the name of providing them with shelter.



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## CHAPTER FIVE

### 5.0 Influence of Cooperative Housing Finance on Housing Affordability in Nairobi City County, Kenya

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#### 5.1 Abstract

Kenya has a significant housing backlog since access to housing finance is becoming increasingly difficult. As a result, the majority of home developers, including housing cooperatives, are unable to find reasonable financing. Therefore, this paper looked at the effect of financing co-operative housing on the availability of affordable housing in Nairobi City County. Specific objectives were to analyse the main sources of co-operative housing finance employed by the housing co-operatives and to examine the effect of co-operative housing finance on housing affordability in Nairobi City County. This study employed both quantitative and qualitative techniques in a descriptive research design. The target population was all active housing cooperatives in Nairobi City County that had been registered by the commissioner of cooperatives. From 35 active housing cooperatives in Nairobi City County, 397 respondents were chosen using a simple random sampling technique. Both descriptive and inferential statistics were used to analyse the data. Correlation analysis and a mixed effect model was used to test the hypotheses. The results show that member savings with p-values of 0.000, cooperative loans with p-values of 0.000, government loans with p-values of 0.019, and bank loans with p-values of 0.020 significantly influenced housing affordability. The results also show that the weighted average cost of capital (WACC) for financing co-operative housing is 7.088% which implied that interest charged on finance obtained from housing cooperatives were much low compared to the market rate. In conclusion, member savings were most preferred as source of financing cooperative housing followed by government loan. However, cooperative loan was leading in financing cooperative housing because of their accessibility and affordability. The paper recommends to housing cooperatives to form saving scheme policy that will help members to negotiate for cheaper credit from financial institutions based on their savings. The paper also recommends for redesigning and restructuring of Kenya mortgage refinance company (government loans) to open up for housing cooperatives organisation to access finance and participate in decision making. Also, the paper recommends ministry of finance to give special consideration to housing cooperatives in terms of accessing bank loans for housing development from financial institutions.

**Keywords:** Housing Co-operative finance, Affordability, Co-operatives,

## 5.2 Introduction

At the moment, housing is one of the most misunderstood social issues and is increasingly out of reach for majority of the population in most countries cross the world (World Economic Forum, 2019). Over 1.6 billion people, or 20% of the world's population, live in subpar housing and frequently lack access to infrastructure and necessary amenities (World Cities Report, 2020). Furthermore, UN-Habitat (2019) projected that by the year 2030, 3 billion people would need new housing and basic urban infrastructure. However, various nations cross the world have initiated strategic interventions in addressing housing needs particularly in urban areas. Despite this progress, still there is significant challenges including a severe housing affordability issue in major cities (Owotemu and Ogohi, 2021).

A well-functioning housing system must have a strong housing financing system (Warnock and Warnock, 2008). Housing finance system facilitate flow of funds from those with excess (savers) to households with inadequate financial funds who require to purchase, construct or renovate their housing units (Gulter and Basti, 2014). Efficient housing finance systems facilitate the provision of long-term finance which makes housing affordable by spreading payments over time (Warnock and Warnock, 2008). There are principally two main methods which facilitate flow of funds these are debt and equity finance. Different methods are used to finance housing development including: housing loans; mortgage loans for housing; securitisation; housing micro finance and equity method and informal finance method (Chiquier and Lea, 2009). Building Society/Savings and Loan, Housing Association and Cooperatives provide loans to their members which are secured by shares and savings. These institutions mobilize savings from members and at times enjoy subsidies and tax incentive from the government. These loans are characterized by low interest rates, short term repayment period, secured on members' shares and savings.

Housing cooperative is alternative tenure option which all of the residents share ownership of the building, have democratic control over it, and profit from the social and financial advantages of doing so (Crabtree *et al.*, 2019). Housing cooperative mobilize savings from their members which allow them to access affordable financing without any collateral (Sørvoll and Bengtsson, 2020). Ponka (2018) observed that member participation through savings contributions and patronage of



the co-operative activities make the co-operative housing affordable. Lang, (2015) argued that member savings was critical component on housing affordability and social cohesion. Consequently, in other nations including Canada, Sweden, Norway, and Uruguay have adopted a number of co-operative models, including full equity co-operative models, limited co-operative models, and non-equity co-operative models, to cater for social-economic differences among their members (Crabtree *et al.*, 2019). According to the Canadian Mortgage and Housing Corporation (2003), cooperative housing offered lodging at significantly lower "shelter cost to income" ratios than the private rental sector in the early 2000s.

In comparison to the industrialized economies, housing finance in Africa is in its infancy. For instance, housing financing accounts for less than 1% of GDP in Nigeria, Cameroon, Egypt, Côte d'Ivoire, Ghana, Tanzania, and Burkina Faso, whereas the proportion of mortgage loans to GDP in Chile, Costa Rica, Malaysia, and Thailand ranges from 15% to 36%. (Nguena, *et al.*, 2016). This situation has led to high number of housing backlog in various countries in Africa like Kenya, Tanzania, Uganda and Rwanda 200, 000, 2, 000, 000, 2,100,000 and 458,000 respectively (Anyanzwa, 2018). The role of government providing affordable housing is diminishing among African countries, despite increasing housing needs. However, emergence of housing cooperative in Africa as third force has created impact in provision of affordable housing. For instance, housing cooperatives in South Africa has managed to provide affordable housing through provision of affordable financing from government loan and cooperative bank loans (Ganapati, 2014). In Nigeria housing cooperatives provided cooperative loans to their members for housing construction and other related projects at affordable rate (Olujimi, *et al.*, 2021). Work-based cooperatives came together in Tanzania and Zimbabwe to offer cooperative housing loans to their members for the construction of houses (International Co-operative Alliance, 2012).

As of 2019, the population of Kenya was predicted to be 47.6 million, with 31.1% of the population living in urban centres and an annual growth rate of 4.3% (KNBS, 2019). The World Bank (2018) estimates that there are 2 million housing units still on the demand backlog. The supply is just 50,000 units per year, whereas the annual demand is 250,000 units. According to the UN-Habitat (2019), more than 65 percent of Kenya's urban population lives in appalling conditions without access to essential amenities like water and sanitation. For instance, just 20% of the newly built housing

units in Nairobi City County are intended for the lower income category and the 80% are for high income group where the demand for affordable housing is low. However, the creation of National Housing Finance, Kenya Mortgage Refinancing Company (KMRC), Slum Upgrading Program, and Affordable Housing Program show the government's ongoing commitment to providing affordable housing (Kieti *et al.*, 2020).

Housing development requires significant economic investment because it is capital intensive (Njoroge *et al.*, 2021). According to Kieti, *et al.*, (2020), low-income consumers are particularly hampered by a lack of affordable home financing and home prices are out of reach. Jones & Stead (2020) pointed that people who have been successful in acquiring land are unable to obtain financing from financial institutions because of their unreliable work and irregular flow of income, weak property rights, and lack of collateral. For lenders, this issue is made worse by a general dearth of reliable information and statistics on the traits of such individuals and effective methods to evaluate affordability (Pazarbasioglu, *et al.*, 2020). As a result, low-income individuals throughout Kenya frequently construct substandard dwellings using expensive credit from money lenders (Mose *et al.*, 2018). This situation is reflected in mortgage account holder of 27, 993 out of population of 47 million Kenyan as at the end of 2019 (Kenya National Bureau of Statistics, 2020). In addition, the cheapest new constructed house in Nairobi capital city cost KSh 2,70, 000 (US\$24,590) as at 2021 which is out of reach for majority of Kenyans who are under low- and middle-income earners (Mwangi, 2021).

Cooperative housing model has the capacity to build and provide affordable financing to their members through collectively pooling resources (Crabtree *et al.*, 2019). Members of housing cooperatives normally access finance which in many instances might not be possible individually. A range of household types across the economic spectrum are served by housing cooperatives, which are primarily based on cooperative models that serve low- and moderate-income households (Malatest and Associates, 2018). According to the Sørvoll and Bengtsson (2020), cooperative housing is built collectively taking advantage of economic of scale where building material are acquired in bulk hence reducing the total cost of construction by great margin. Ganapati (2014) observes that housing cooperative scheme provide opportunity for members to make regular saving that help them to access sufficient

home financing through housing cooperative at affordable rates. Cooperative residents' do not own their homes but rather own shares in the cooperative, which entitles them to live in one of the cooperative's dwellings (Crabtree *et al.*, 2019). This will enable millions of Kenyans who currently live in bad conditions to join housing cooperatives (Claudia, 2014).

A number of scholars, Kieti *et al.*, (2020); Mwau *et al.*, (2020); Gardner *et al.*, (2019); Mose *et al.*, (2018) observed that affordable housing was affected by a number of factors such as inefficient system of land registration, unaffordable finance, limited supply developable land, speculation of prices of land, lack of physical and social infrastructure and inappropriate policy and regulation. Additionally, Voellmecke (2011) observed that women in housing cooperatives are precluded from participation in the supply of cheap housing. In contrast, Onchieku and Ragui (2019) looked at the effect of strategic leadership on the success of housing co-operative societies in Nairobi City County. Shihembetsa (2018) also looked into the National Co-operative Housing Union's (NACHU) institutional capability and capacity for the implementation of housing projects for low-income households in Kenya.

Therefore, the paper singles out the issue of housing finance as major contributor to affordable housing. A steady supply of housing financing for low-income people to purchase housing at a reasonable price has not be realized. One major structural hurdle that prevents the expansion and durability of affordable housing is lack of end-user housing financing. Therefore, this paper dissects and investigates co-operative housing finance as a key problem that limits both housing access and scale of delivery. The paper's specific objectives are to: i) to analyse cooperative housing finance used by housing cooperatives and (ii) assess the influence of cooperative housing finance on housing affordability.

### **Research hypotheses**

Ho<sub>1</sub>: Member savings has no significant influence on affordability of houses provided by housing cooperatives

Ho<sub>2</sub>: Cooperative loans has no significant influence on affordability of houses provided by housing cooperatives

Ho<sub>3</sub>: Government loans has no significant influence on affordability of houses provided by housing cooperatives

Ho<sub>4</sub>: Bank loans has no significant influence on affordability of houses provided by housing cooperatives

### **5.3 Theoretical Underpinnings**

One of the most important theories of corporate leverage is the pecking order theory of capital structure. According to theory, organizations prefer to utilise funds generated internally such as retained earnings and reinvest back to the business rather than seeking funds from external lenders (Myers and Majluf, 1984). The pecking order theory idealizes and advises that internal financial resources must be used up before looking for outside funding. According to Myers (1984), when firms are acquiring finance from outside, it is necessary to prefer debt over equity due to the lower information costs associated with debt issues. Notably, different types of businesses have different capital structures, resulting in distinct business decisions for each firm. This means that organizations can think about raising money from other sources after using savings to support investments. Li *et al.*, (2015) found that housing co-operatives typically use equity financing and very little outside loans for the construction of new dwellings. But there is always a trade-off between the several financing options. For instance, loans can act as a tax shelter because interest paid on credit is tax deductible, but they also expose businesses to bankruptcy risks if they fail to make their payments (Zelia and Caetano, 2015).

The pecking order theory has been co-opted to housing cooperative like any other firm which require financing for growth. Housing co-operative members contribute to the funding of their co-operative housing' operations through member deposits and share capital. Housing cooperatives can also get money from retained margins, member loans, and short- and long-term funds (Wang, 2016). Share capital and reserves make up core capital. These funds belong to the shareholders of the housing cooperative society. The co-operative societies set aside earnings as institutional capital, a general and revenue reserve designation. The institutional capital protects members from operational risk and insufficient capital by acting as a stop gap to compensate asset losses that may arise from unfavourable economic cycles (Robb, *et al.*, 2010).

This theory is important to this study because of two aspects. First, the theory offers recommendations for the types of financing that housing cooperatives can utilize to fund their housing development. The most readily available and cost-effective source

of funding for housing cooperatives is seen to be internal funding. This theory is related to the variable whose focus is to investigate the effect of financing cooperative housing on housing affordability of housing cooperatives in Nairobi City County Kenya. Second, when retained earnings have been used up before issuing share capital, pecking order suggests debt financing. Therefore, this postulates a framework for making financial decisions that can lower financing costs while still ensuring an entity's life and growth.

#### **5.4 Research Methodology**

The paper used a mixed-methods approach, adopting both qualitative and quantitative techniques. The goal of the paper was to evaluate how cooperative housing finance affected the affordable homes supplied by housing cooperatives in Nairobi City County, Kenya. The cause-and-effect relationship between cooperative housing finance and affordable housing was established using a causal approach. The descriptive research design was employed in this paper to evaluate various cooperative housing financing sources; to gather information and investigate traits and attributes without necessarily examining correlations between causal elements (Saunders and Thornhill, 2012). Data at a single point in time were collected using the cross-sectional method, which is regarded useful when resources are limited (Jogulu and Pansiri, 2011).

The study was carried out in the city county of Nairobi, which has the highest number of housing co-operatives (115 out of 916, or 12.6% of total housing co-operatives) with a membership of 48,803 as of 31<sup>st</sup> December 2018 (State Department for Cooperatives, 2019). Second, according to the 2019 census, Nairobi is the county with the largest population and the highest percentage of individuals lacking adequate housing, with a population of 5,119,000 (KNBS, 2020). Third, Nairobi, Kenya's capital and largest city, with the largest informal settlements in East Africa (Emma & Kristine 2019). As a result, there is a basis for gathering accurate and trustworthy information about cooperative housing finance and housing affordability

The housing co-operatives in Nairobi City County were the study's target population. In Nairobi City County, there are 115 housing co-operatives with 48, 803 members, according to the State Department of Co-operative (2020). A sample of 35 active housing co-operatives were selected based on the consecutively filing returns for a

period of a five-year (2012 to 2017). The simple random sampling was used to select sample size of 397 members from a total sample of 48,803 respondents in 35 active housing cooperatives in Nairobi City County based on the formula for sampling a finite population given by;  $n = \frac{N}{1 + (N \times e^2)}$  where n is the sample size, N is the population size and e the permissible error. Yamane (1967) introduced this formula as a streamlined method of calculating sample size for a finite population.

The calculation as follows:

$$n = \frac{48,803}{1 + (48,803 \times 0.05^2)}$$

$$n = \frac{48,803}{123.0075}$$

$$n = 397$$

Both quantitative and qualitative data collection methods were used in the study. Therefore, triangulation of data collection methods was used, hence allowed collaboration of results within the study (Saunders and Thornhill, 2012). Both primary and secondary data were collected for quantitative analysis. Primary data was collected using survey questionnaires consisting of open and closed –ended questions to the 397 members who responded to the indicators of housing affordability in the eyes of the members. Secondary data was collected from the housing cooperative records that were accessed through 35 housing co-operatives in Nairobi City County.

The qualitative data was collected using key informants' interviews and documentaries. A total of 10 KIs were drawn from various cooperative organisations including officers from the state department of cooperatives, managers of housing cooperatives and both current and former board directors of housing cooperatives in Nairobi City County were purposively selected based on their knowledge, status and position they held in various co-operative organisations in Kenya. Field notes and electronic audio recorders were used to collect qualitative data, which was then typed into Atlas software, categorized, coded, and organized into themes for analysis. The qualitative data supplement data that was collected quantitatively.

The study's data collection tool for measuring constructs was sufficiently valid and reliable to provide measurements of the constructs using the indicators that were kept. Construct validity evaluation was used to confirm validity. Based on confirmatory factor analysis, the validity findings revealed that 16 of the 20 indicators suggested

by the theoretical model loaded the construct over 0.4 and were kept for the construct on cooperative housing finance. It is advised that indicators loading below 0.40 be deleted when factor analysis is applied (Yong and Pearce, 2013; Tabachnick and Fidell, 2007; Maskey, Fei and Nguyen, 2018).

For the build on housing affordability, 8 out of the 26 indicators were eliminated because they had factor loadings of less than 0.4 on the construct, leaving only 18 indicators. Based on the average variances extracted (AVEs) of the constructs, which are above 0.5, the maintained factor loadings demonstrated satisfactory convergent validity (Hamid, et al., 2017). The squared multiple correlations of the constructs, which are fewer than the AVEs, demonstrate the instrument's discriminant validity. The constructs' internal consistency as determined by the indicators was evaluated using Cronbach's alpha to determine reliability. Both constructs have alpha values larger than 0.7, as indicated in table 5.10, indicating appropriate dependability (Field, and Hole 2009; Hair *et al.*, 2014).

**Table 5. 1 : Reliability and Validity**

	AVE	Squared correlations	N0. Of items	KMO & Bartlett's test	Cronbach's Alpha All items
<b>All indicators</b>					
Cooperative Housing finance	0.503	0.235	20	KMO=0.850, Chi(190)=3278.483, p-value=0.000	0.864
Housing affordability	0.513	0.198	26	KMO=0.783, Chi(325)=4558.803, p-value=0.000	0.862
<b>Retained indicators</b>					
Cooperative Housing finance	0.540	0.235	16	KMO=0.850, Chi(120)=3187.483, p-value=0.000	0.885
Housing affordability	0.589	0.122	18	KMO=0.861, Chi(153)=3304.803, p-value=0.000	0.884

**Table 5. 2 : Factor loadings; Cooperative Housing finance and housing affordability**

Indicator	Factor Loadings
<b>Member Savings</b>	
1 Savings is the core primary financing means for housing development	<b>0.498</b>
2 Savings act as Collateral	<b>0.394</b>
3 Savings mobilize resources for future investments	<b>0.514</b>
4 Shares investments use as a revolving loan fund	<b>0.147</b>
5 Savings reduce the cost of financing (No interest charged)	<b>0.747</b>
6 Savings boost one to access more credit	<b>0.876</b>

<b>Cooperative loan</b>		
7	Cooperative loans have the lowest interest in the market	<b>0.529</b>
8	<b>Cooperative loans are secured by members savings</b>	<b>0.383</b>
9	Cooperatives offer friendly and affordable loan repayment plan	<b>0.563</b>
10	Cooperatives members can own a house before paying fully	<b>0.677</b>
11	<b>Cooperative loans are long term financing</b>	<b>0.337</b>
12	No collateral is required in obtaining cooperative loan	<b>0.958</b>
<b>Government loan</b>		
13	Government loan reduces the cost of construction for cooperative housing	<b>0.621</b>
14	<b>Government grants offset loan repayment</b>	<b>0.163</b>
15	Government loan build infrastructure and other amenities	<b>0.592</b>
16	<b>Government loan is adequate to finance cooperative housing</b>	<b>0.139</b>
17	Government loan acquire land for cooperative housing development	<b>0.567</b>
18	Government loan used for renovation and maintenance of coop homes	<b>0.567</b>
<b>Bank loan</b>		
19	Bank loan requirements are friendly to low-income earners	<b>0.954</b>
20	<b>Background checks is not mandatory for one to access bank loan</b>	<b>0.343</b>
21	It takes a short period in obtaining bank loan	<b>0.595</b>
22	<b>Bank loan is a friendly to housing cooperative members</b>	<b>0.397</b>
23	The interest charged on loan is friendly and affordable to low income	<b>0.567</b>
24	<b>Bank loan has lower transaction cost in the market</b>	<b>0.237</b>
25	Servicing of the bank loan is affordable to low-income earners	<b>0.681</b>

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In order to construct criteria to test the study hypothesis and reach conclusions regarding the study's goal, data analysis was done. Regression models that were fitted to the data were used to draw conclusions. The dependent variable was measured from the retained 18 indicators while cooperative housing finance was measured by 16 indicators which were classified into four sub dimensions of cooperative housing finance (member savings, co-operative loans, bank loan and government loan).

On the other hand, the measurement of the dependent variable (housing affordability) aimed to ascertain how much weight members attributed to recommended affordability indicators that were kept in the pilot study. According to a proposed ordinal scale of importance, respondents evaluated the housing affordability criteria associated to their housing cooperatives in the following order: 1-not at all important, 2-less important, 3-important, 4-slightly important, and 5-most important (Rosli. *et al.*, 2016; and Mulliner and Maliene, 2015). The ordinal scores from the indicator responses were weighted to create an overall index of home affordability. By dividing the mean score by the sum of mean scores and multiplying by 100 (ensuring that the total of all weights is 100%), Mulliner and Maliene (2012) method was used to establish the indicator's weights. Housing affordability overall had a mean score of 3.202, a standard deviation of 0.805, and a coefficient of variation of 25.13%



$$\omega_i = \frac{\bar{X}_i}{\sum_{i=1}^{18} \bar{X}_i} \times 100$$

Where ;

$\omega_i$  is the weight of indicator i

$\bar{X}_i$  is the mean of indicator i

The study used multilevel mixed effect modelling based on restricted maximum likelihood to account for the multilevel structure of the data obtained (REML). The study hypothesis was tested using the models that were fitted. Normality and heteroscedasticity were put to the test.

Multi-level statistical analysis methods were taken into consideration when fitting the models to evaluate the study hypothesis. In general, multilevel data can be thought of as a way to investigate cross-level hypotheses when the relationships between variables are measured at several levels according to Hox (2010) units of analysis. The objective is to evaluate the value of cooperative housing finance (level 1) in extending access to affordable housing in Kenya through housing cooperatives (level 2).

As each member is asked to respond based on their perception of housing affordability at their respective housing cooperatives as designed in the data collection tool, variation in cooperative housing finance and the affordability is expected at both level 1 (fixed effects) and level 2 (random effects). The random-intercept model at the member level with only one fixed effect predictor would be defined individually at levels 1 and 2 in a hierarchical fashion as follows:

The equation is given by;

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1,ij} + \beta_2 X_{2,ij} + \beta_3 X_{3,ij} + \beta_4 X_{4,ij} + \mu_{1j} X_{1,ij} + \mu_{2j} X_{2,ij} + \mu_{3j} X_{3,ij} + \mu_{4j} X_{4,ij} + \varepsilon_{ij}$$

In the equations:

$Y_{ij}$  is the level of housing affordability as viewed by respondent  $i$  nested from county  $j$ ;

$X_{1,ij}$  is the cooperative housing finance of member  $i$  nested in co-operative  $j$ ;

$\beta_1$  to  $\beta_4$  are the fixed effect estimates coefficient of the predictors (level-1 effects)

$\gamma_{0j}$  is the intercept which has a separate specification equation due to the 2 levels assumed to cause variation in housing affordability. In the intercept equation;

$\beta_{0j}$  is the level 1 intercept which is the average housing affordability for the entire population; and

$\mu_{0j}$  is the county specific effect (cluster specific) random intercept.

$\mu_{1j}$  is the random slope (random coefficient) of  $X$  at cooperative  $j$  (level-2 coefficient of  $X$ )

$\varepsilon_{ij}$  is the overall error term

## 5.5 Finding and Discussion

### 5.5.1 Main sources of co-operative housing finance

One of the objectives of the paper was to analyze cooperative housing finance employed by housing co-operatives. The data was collected from 35 active housing co-operatives registered under the state department of cooperative in Nairobi city county Kenya as at 31 first December 2018.

**Table 5.3 : Main Sources Co-operative Housing Finance**

S/No	Sources of finance	Amount of funds	Weight	Interest rate P. a%	WACC
1	Member savings	2,282,482,563	0.242	0	0
2	Co-operative loans	4,525,896,076	0.480	12(1-0.3)	4.035
3	Bank loans	2,243,413,513	0.238	17(1-0.3)	2.833
4	Government loan	370,512,416	0.039	8(1-0.3)	0.220
	<b>Total</b>	<b>9,422,304,568</b>	<b>1</b>		<b>7.088</b>

The results presented in Table 5.3 show that the weights of various sources financed cooperative housing includes member savings 0.242, co-operative loans 0.480, bank loan 0.238, and government loans 0.039. The results show that the cooperative loan was leading in financing cooperative housing followed by member savings. The

results also show that the weighted average cost of capital (WACC) for housing cooperative is 7.088% which is the much lower compared to the market rate. According Cytonn (2018), market rate for housing finances ranges from 17% to 22% as at December 2018. Thus, housing cooperatives remains the cheapest mode of financing affordable housing, boosted by members' savings that is charged zero interest rate. These results contradict the findings of Ferguson and Smets (2009) which reported that savings accounts for largest portion of 58% of the total housing finance used for incremental building by slum dweller households in Hyderabad, India. Meshubi (2012) also found that personal income/savings accounts for the highest source of housing finance followed by cooperative loan in their study. Philosophically housing cooperatives need to finance their operations using internal funding and a small percentage of financing from outside (Cooperative society act of 2010).

**Table 5. 4 : Opinion of Members on Main Sources of Co-operative Housing Finance**

<b>Statements</b>	<b>Mean</b>	<b>Std.</b>	<b>CV</b>
<b>A. Member Savings</b>	4.551	0.657	14.43%
Savings is the core primary financing means for housing development			
Savings reduce the cost of financing (No interest charged)	4.133	1.032	24.98%
Savings boost one to access more credit	4.197	0.911	21.72%
Savings mobilize resources for future investments	4.008	0.959	23.92%
Overall	4.205	0.912	21.68%
<b>B. Cooperative loan</b>			
Cooperative loans have the lowest interest in the market	4.083	0.906	22.19%
Cooperatives offer friendly and affordable loan repayment plan	3.792	1.077	28.39%
Cooperatives members can own a house before paying fully	3.695	1.133	30.67%
No collateral is required in obtaining cooperative loan	3.817	1.095	28.70%
Overall	3.847	1.053	27.37%
<b>C. Government loan</b>			
Government loan reduces the cost of construction for cooperative housing	3.956	1.002	25.33%
Government loan build infrastructure and other amenities	2.831	1.091	38.54%
Government loan acquire land for cooperative housing development	2.878	1.058	36.76%
Government loan used for renovation and maintenance of coop homes	1.997	1.066	53.38%
Overall	2.916	1.054	36.15%
<b>D. Bank loan</b>			
Bank loan requirements are friendly to low-income earners	2.360	1.199	50.81%
It takes a short period in obtaining bank loan	2.781	1.108	39.84%
The interest charged on loan is friendly and affordable to low income	1.881	0.966	51.36%
Servicing of the bank loan is affordable to low-income earners	1.939	1.047	54.00%
<b>Overall</b>	2.240	1.058	47..23%

The findings in Table 5.4 shows that highest mean score for various sources of housing finance is member saving of 4.205 with standard deviation 0.912 and co-efficient of variation of 21.68%. Implying that member savings were generally primary source of housing finance because majority of the members are employed in informal sector with irregular low income which is difficult for them to access and affordable financing from financial institutions. The lowest mean score was bank loan of 2.240, with standard deviation 1.058 and co-efficient of variation of 47.23%. This implied that bank loan was used as a last resort to finance housing development for housing cooperative members because housing cooperative are supposed to finance themselves internally.

### **5.5.2 The effects of cooperative housing finance on housing affordability**

The paper examined four main sources of cooperative housing finance namely (member savings, cooperative loans, government loan and bank loans) using multiple regression model. One of the conditions of using multiple regression model is that predictors of either independent or dependent variable must be more than two. The other scholars have used multiple regression model include Van wyk<sup>1</sup> and Jimoh (2015) used four predictors, Njoroge, (2021) used four predictors, and Kebede and Nakkiran (2020) used four predictors variable in their respective studies.

The best model for analysing how housing finance affects housing affordability in housing cooperatives was discovered to be M1, which had no level-2 random effects and level-1 fixed impacts on affordability. Table 5.13. There was no random slope in the model, but there was a substantial fixed effect component (Wald chi-square (1) = 23.43, p-value = 0.000). The coefficient estimates of housing finance towards member savings, cooperative loan, government loan, and bank loan were found to have a significant fixed effect on housing affordability, which exists regardless of the entity (p-value= 0.019; =0.082, Z= 2.340, p-value = 0.019; =0.128, Z= 4.840, p-value = 0.000; =0.107, Z= 3.950; =0.065, Z= 2.330, p-value = 0.020). The p-value of the housing financing fixed effect coefficient is displayed as being less than 0.05.

A likelihood ratio test was used to compare the M1 model with random intercepts with the M2 model with the random covariate of the housing finance in order to determine the relevance of the random influence of housing finance across entities. The LR test reveals that the LR chi-square statistic has not changed significantly (LR

chi2 (1) = 0.33, p-value = 0.566). By adding the random slope (effect) of housing finance toward housing affordability of housing cooperatives as a level-2 covariate, the model would not significantly change, according to the p-value of the LR chi-square statistic, which is greater than 0.05. The Bayesian information criterion (BIC) statistics of M1 are lower than those of M2, indicating that M1 is a better model than M2 because it does not include housing finance as a random covariate. As a result, M1 was chosen as the best model. The ideal model fitted for the sources of home finance produces the equation, which is;

$$Y_{ij} = 2.322 + 0.128X_{1,ij} + 0.107X_{2,ij} + 0.082X_{3,ij} + 0.065X_{4,ij} + \mu_{0j} + \varepsilon$$

$$\gamma_{0j} = \mu_{0j}$$

**Table 5. 5 : Cooperative Housing finance on Housing Affordability**

Mixed-effects REML regression				Wald chi2(1)	= 23.43		
Log restricted-likelihood = -183.064				Prob > chi2	= 0.000		
Affordability (fac1_1_y)	Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]		
Member Savings (X <sub>1</sub> )	0.128	0.027	4.840	0.000	0.076	0.180	
Cooperative loan (X <sub>2</sub> )	0.107	0.027	3.950	0.000	0.054	0.161	
Government loan (X <sub>3</sub> )	0.082	0.035	2.340	0.019	0.013	0.150	
Bank loan (X <sub>4</sub> )	0.065	0.028	2.330	0.020	0.010	0.120	
_cons	2.322	0.105	22.22	0.000	2.118	2.527	
Random-effects Parameters				Observed Estimate	Bootstrap Std. Err.	Normal-based [95% Conf. Interval]	
<b>Housing cooperative</b>							
sd(_cons)	0.008	0.006		0.002	0.031		
sd(Residual)	0.151	0.012		0.130	0.176		
LR test vs. linear regression: chi2(2) = 4.60 Prob >= chibar2 = 0.0160							
Level	ICC	Std. Err.	[95% Conf.	Interval]			
<b>Housing cooperative</b>	0.053	0.034	0.015	0.175			
Likelihood-ratio test		LR chi2(1)	=	0.33			
(Assumption: M1 nested in M2)		Prob > chi2	=	0.566			
Model	Obs	ll(null)	ll(model)	df	AIC	BIC	
M1	361.000	.	-183.064	4.000	374.128	389.683	
M2	361.000	.	-182.899	5.000	375.799	395.243	

To test the hypothesis under investigation and draw a conclusion regarding the study objective, which was to assess the effect of cooperative housing finance on housing affordability.

H<sub>01</sub>: Member savings has no significance influence on housing affordability

The best-fit bivariate models revealed that cooperative housing finance has a considerable fixed effect on housing affordability but no significant random effect. However, the substantial effect is constant across all housing cooperatives, suggesting that cooperative housing financing toward their housing cooperatives have a constant (fixed) effect on the member's view of housing affordability across all

housing cooperatives. Cooperative housing financing has a consistent effect across all housing cooperatives. The random slope's lack of significance suggested that cooperative housing financing toward savings of the housing co-operatives only have a fixed effect on the member's opinion of housing affordability inside their housing co-operatives. The fixed effect coefficient estimations' Z-statistics p-values were found to be less than 0.05. As a result, the null hypothesis was rejected, and it was determined that member savings affects housing affordability.

The effect does not fluctuate haphazardly among housing cooperatives. With fixed slopes and random intercepts, the mixed effect model is represented graphically in Figure 5.8. The fixed effect is demonstrated by the fixed slopes that are displayed by parallel lines to imply a fixed and constant slope across the many housing cooperatives. To reflect the various degrees of housing affordability as perceived by members of various housing cooperatives, the random intercepts are represented by varied lines.

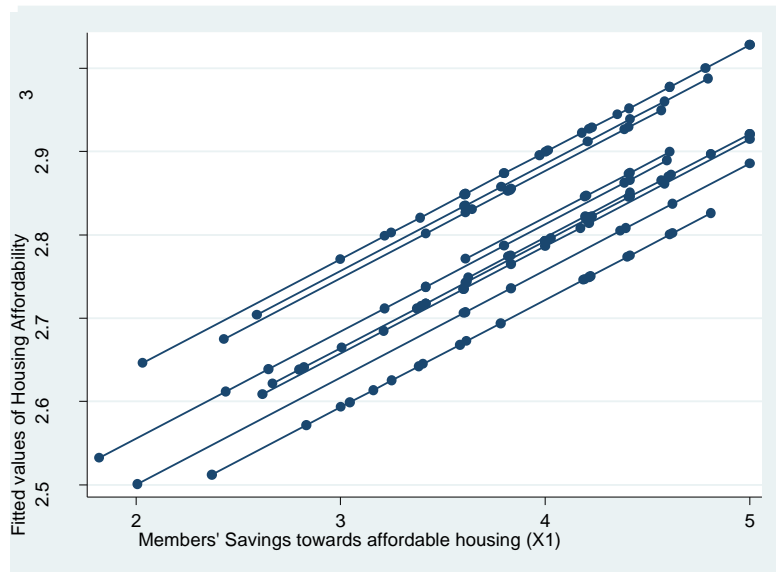
This suggests that not all housing cooperatives offer housing at an equally affordable level, since some cooperative members regard their cooperative to be more affordable than that of other cooperative members based on the amount of money they have saved with their cooperatives. According to Ferguson and Smets (2009), the majority of the 58% of housing finance used for incremental building among urban slum dwellers in India comes from savings. Although Meshubi (2012) found that member savings accounts were the most common method of house financing, the same opinions were expressed. The main informant from the National Co-operative Housing Union (NACHU), who spoke in support of this claim on member savings, indicated that:

*It is a common misconception that individuals with low incomes don't save, however based on my own experience, I can state unequivocally that those with low incomes are the best savers. (Interview field data, Nairobi, August, 2018)*

Another key informant from Nairobi teachers housing cooperatives expressed a similar opinion, saying that

*".....Most of the land bought by housing cooperative is financed by member savings...." (Interview field data, Nairobi, August, 2018)*

Qualitative data collected from significant sources clearly show the member savings' crucial contribution to the provision of affordable housing.



**Figure 5. 1 : Mixed model of housing affordability against Member Savings**

H<sub>02</sub>: Cooperative loans has no significance influence on housing affordability

Because of the random slope's lack of significance, it was assumed that cooperative housing finance and cooperative loans of the housing co-operatives only had a fixed effect on members' perceptions of home affordability inside their housing cooperatives. The effect does not fluctuate haphazardly among housing cooperatives. With fixed slopes and random intercepts, the mixed effect model is presented graphically in Figure 5.7. The fixed effect is demonstrated by the fixed slopes that are displayed by parallel lines to imply a fixed and constant slope across the many housing cooperatives. To reflect the various degrees of housing affordability as perceived by members of various housing cooperatives, the random intercepts are represented by varied lines. The fixed effect coefficient estimations' Z-statistics p-values were found to be less than 0.05. As a result, the null hypothesis was rejected, and it was determined that cooperative loans affects housing affordability.

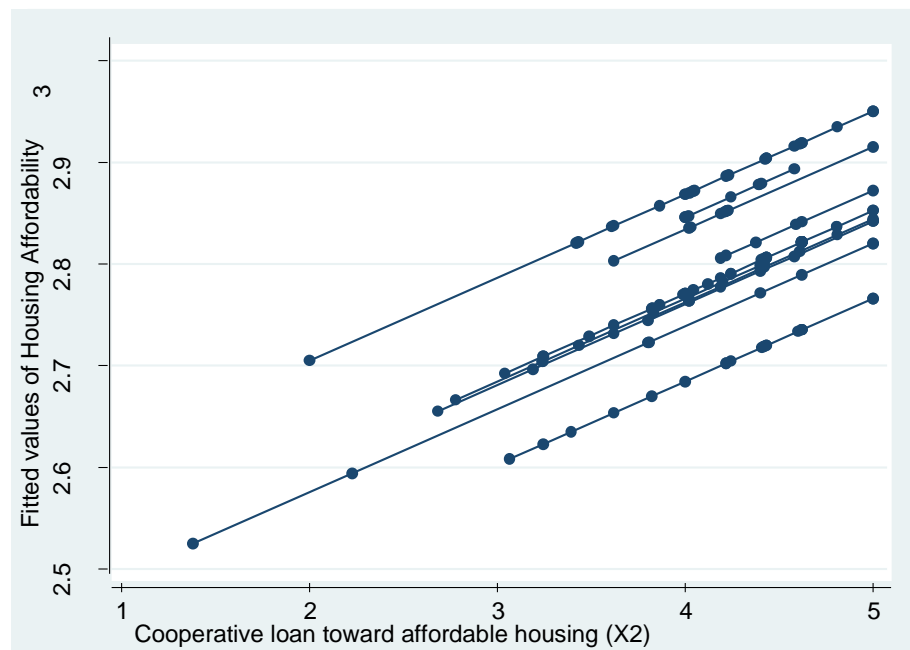
This suggests that not all housing cooperatives offer homes at an equally affordable price since members of some cooperatives believe their co-op is more affordable than members of other cooperatives. However, the impact of cooperative housing finance on cooperative loans made to housing cooperatives by members has an identical impact on affordability across all cooperatives. Scanlon, *et al.*, (2014) contend that co-operative loans are distinguished by low interest rates, quick repayment terms, and security based on members' savings and shares. According to the World Bank (2017)

and Bondinuba *et al.*, (2016), co-operative loans are the most common form of housing financing in African nations. Oyewole (2010) investigated how low-income individuals responded to their inability to get official housing financing through cooperative societies. The author discovered that co-operative loans performed better on affordability, transaction costs, and collateral indices than loans from PMIs, and that co-operative loans had a higher co-operators satisfaction index than loans from PMIs.

The key informant from Kenhurt Housing Co-operative, who served as the foundation for this opinion, stated that

*"...loans obtained from cooperative organizations, particularly Sacco's, are easily accessible and inexpensive to low- and middle-income groups....."*  
(Field interview data from Nairobi, August 2018)

The void left by commercial banks' exclusion of low- and middle-income earners from obtaining housing finance for housing development is being filled by cooperative societies, particularly cooperative banks and Sacco's.



**Figure 5. 2 : Mixed model of housing affordability against cooperative loan**

H<sub>03</sub>: Government loans has no significance influence on housing affordability

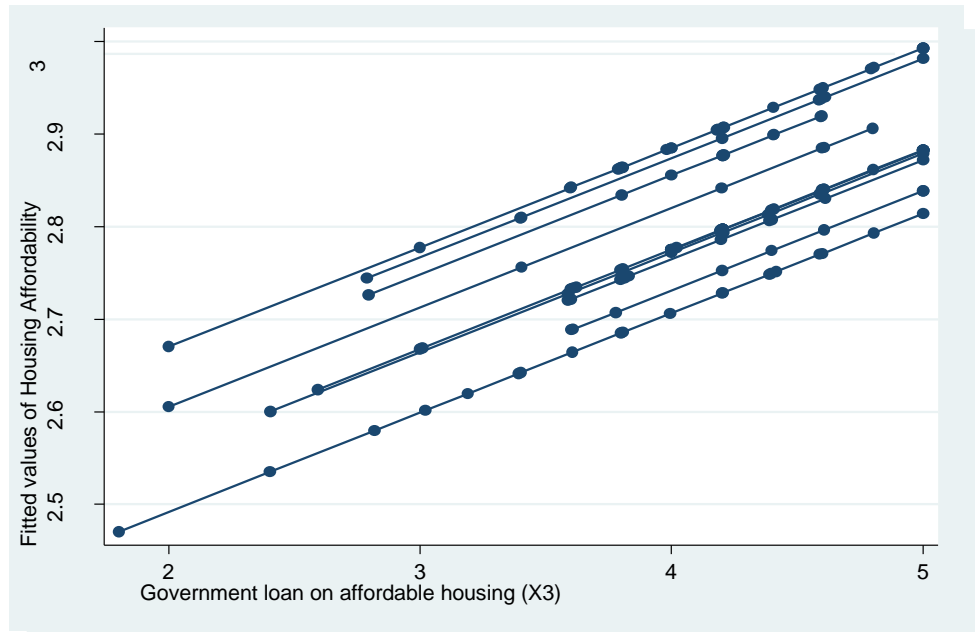
The random slope's lack of significance suggested that cooperative housing finance for government loans of the housing co-operatives only has a fixed impact on members' views of housing affordability within their housing cooperatives. The effect does not fluctuate haphazardly among housing cooperatives. With fixed slopes and



random intercepts, the mixed effect model is presented graphically in Figure 5.10. The fixed effect is demonstrated by the fixed slopes that are displayed by parallel lines to imply a fixed and constant slope across the many housing cooperatives. To reflect the various degrees of housing affordability as perceived by members of various housing cooperatives, the random intercepts are represented by varied lines. The fixed effect coefficient estimations' Z-statistics p-values were found to be less than 0.05. As a result, the null hypothesis was rejected, and it was determined that government loan affects housing affordability. This suggests that not all housing cooperatives have the same levels of housing affordability since members of some cooperatives believe their cooperative is more affordable than members of other cooperatives. However, the impact of cooperative housing financing on government loans made to housing cooperatives by members has an identical impact on affordability across all cooperatives. According to Kneebone and Reid (2021), government loans promoted the creation of affordable housing since they had lower interest rates and flexible repayment schedules for housing cooperatives. In addition, Berry (2003) claims that housing cooperatives in industrialized countries receive low-interest government loans to finance the construction of their homes. In agreement with these views, the cooperating state department's key informant made the following arguments:

*“..... the government through the Kenya mortgage refinancing company (KMRC) has investment huge capital for housing development and housing cooperative representative are among the key partners in the company. ....” (Interview field data, Nairobi, August, 2018).*

The qualitative information shed more light on the commitment the government is putting towards provision of affordable housing for all by 2030 according to the sustainable development goal (SDGs) agenda number 11.



**Figure 5. 3 : Mixed model of housing affordability against government loan**

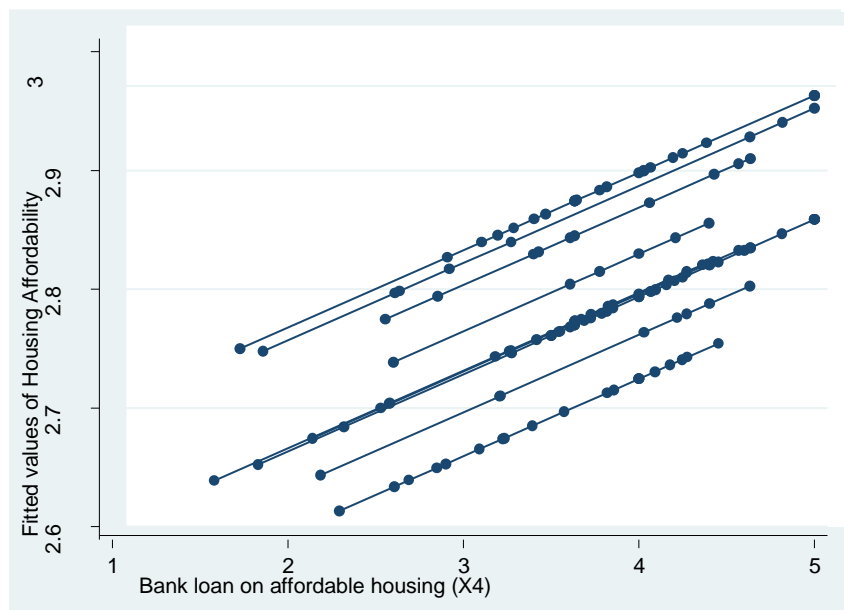
$H_{04}$ : Bank loans has no significance influence on housing affordability

The random slope's lack of significance suggested that cooperative housing financing for bank loans to housing cooperatives only had a fixed impact on members' perceptions of home affordability inside their housing cooperatives. The impact does not fluctuate haphazardly among housing cooperatives. With fixed slopes and random intercepts, the mixed effect model is presented graphically in Figure 5.3. The fixed effect is demonstrated by the fixed slopes that are displayed by parallel lines to imply a fixed and constant slope across the many housing cooperatives. Different lines are drawn from the random intercepts to depict the various degrees of housing affordability as perceived by members of various housing cooperatives. This suggests that not all housing cooperatives have the same levels of housing affordability since members of some cooperatives believe their cooperative is more affordable than members of other cooperatives. The fixed effect coefficient estimations' Z-statistics p-values were found to be less than 0.05. As a result, the null hypothesis was rejected, and it was determined that bank loan affects housing affordability.

However, all housing cooperatives experience a comparable impact from bank loans on affordability. According to Ehlenz (2018) and Gambo *et al.* (2022), formal financial institutions have fallen short in their efforts to fund housing for unofficial sectors. Maina (2013); Ferguson and Smets (2009) concur that due to the significant risk involved, few financial institutions are financing housing finance for housing development. The key informants from Shirika Housing Cooperative backed up this assertion by saying that:

*"..... Commercial banks have failure to provide accessible and affordable housing finance to the market particularly to low- and middle-income households ... .."* (Field interview data from Nairobi, August 2018)

Commercial banks seldom ever finance the construction of dwellings for those without collateral. Only those with high incomes who engage in official employment are eligible for this financing; the majority of Kenyans, who labor in the informal sector, are therefore not included



**Figure 5. 4 : Mixed model of housing affordability against Bank loan**

**5.6 Conclusions and Recommendations**

**5.6.1 Conclusions**

The housing co-operative approach provided the best avenue for provision of affordable financing to their members. The results indicate that cooperative housing finance was classified into four namely; member savings, cooperative loans,

government loan and bank loan. Member savings was found to be the cheapest source of cooperative housing finance because the cost of financing was zero meaning the interest rate was not charged on the fund. The government loan charged interest at 8 % which was the lowest interest charged in the market, followed by cooperative loan with interest rate of 12% and last the bank loan with interest rate of 17% as the highest interest rate charged for housing loan. Also, the finding shows that cooperative loan was the most commonly used as source financing affordable housing, followed by savings, government loan and lastly bank loan. This imply that as much as savings and government loans were the cheapest source of housing finance were not sufficiently enough to cater all the housing needs. In conclusion, the cost of financing cooperative housing through housing cooperatives was found to be relatively cheaper compared to the open market.

### **5.6.2 Recommendation**

Housing cooperatives require access to long-term financing from a various source in order to sustain the demand of housing needs for their members. The paper makes the following recommendations: The housing cooperatives should establish savings scheme which is mandatory for all the members of housing cooperatives. Second, the ministry of cooperatives and small enterprise should enact the law that will allow cooperative organisations (housing cooperatives, cooperative bank, Saccos, CIC, NACHU and KUSCCO) to borrow and lend long term loans amongst themselves particularly loan for housing development. Third, the ministry of finance should restructure and redesign Kenya Mortgage Refinancing Company (government loans) to provide appropriate saving and lending scheme particularly low- and middle-income households. Also, the paper recommends ministry of finance to provide special consideration to housing cooperatives in terms of accessing bank loans for housing development from financial institutions.

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## CHAPTER SIX

### 6.0 Summary, Conclusion and Recommendations

#### 6.1 Summary of the Findings

The study was conducted in Nairobi City County, Kenya. The overall objective of the study was to assess the role of Kenya housing co-operatives on the extension of affordable housing for their members in urban areas in particular Nairobi City County. The study had four specific objectives; assessment of the extent to which housing co-operative models impacted the provision of affordable housing in Nairobi city county, Kenya; establishment of the effect of housing co-operative member participation on housing affordability in Nairobi city county, Kenya; to evaluate supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya, examination of the influence of cooperative housing finance on housing affordability in Nairobi city county, Kenya;

The aim of this study was derived from searcher’s personal experience as a member of housing cooperative in the process of acquiring cooperative housing. The research contribution is tracing of an alternative housing model that ensures a secure, safe, and sustainable housing. Housing cooperative model has been tested to be effective means of providing affordable housing cross the income spectrum. Firstly, Availability of adequate information about housing cooperative models can assist the government and policy makers to come up with policies informed by data. Secondly, it was found that active member participation through various cooperatives activities lowered the total cost of housing construction per a member. Thirdly, the study proposed formation of housing cooperative policy that would address the unique challenges facing members of the housing cooperatives rather than general housing policy. Finally, the study found that the cost of financing cooperative housing through housing cooperative approach were much lower compared to the market.

##### **6.1.1 Profiling housing co-operative models in address housing affordability in Nairobi City County, Kenya**

The aim of this objective was to assess the extent to which housing co-operative models impacted the provision of affordable housing. The indicators used to measure housing co-operative models included formation, ownership, finance and,

management.

In this study, thematic content analysis was used because the data was qualitative in nature. Thematic content analysis, according to Braun and Clarke (2006), focuses primarily on locating patterns or themes within qualitative data, which the study saw as the profiling of housing co-operative models. The following steps were followed based on the Braun and Clarke (2006) approach for thematic content analysis: familiarization with the data, creation of initial codes, search for themes, review of themes, definition of themes, and write-up.

The findings revealed that the limited housing co-operative model is popular compared to other models as many housing and settlement co-operatives began as land buying groups with no other objective. Once this is achieved, the co-operative is dissolved and ownership is transferred to individuals. In addition, this kind of model was suitable for low- and middle-income households because the investment did not require as huge sum of money as other models.

### **6.1.2 Housing co-operative member participation and housing affordability in Nairobi City County, Kenya**

The second objective of the study was to establish the effect of housing co-operative member participation on housing affordability in Nairobi City County, Kenya. Factor Analysis (FA) was done for data reduction by removing all indicators with loadings less 0.5 (50%). The 13 retained indicators which sought to determine the level of member participation in relation to their housing co-operative. The indicators were grouped into four dimensions, then reduced to one overall member participation index. To reduce the dimensions of member participation into a single composite measure, a weighted index was used where the participation index of each indicator for the sample was deduced and used as the weights.

Considering the multilevel structure of the data collected, the study used Multi level mixed effect modelling based on Restricted Maximum Likelihood (REML). The models fitted were used to test the study hypothesis developed for the assumptions of normality and heteroscedasticity were tested. The model showed a significant fixed effect component (Wald chi-square (1) = 5.23, p-value = 0.022) and significant random intercepts but no random slope. The fixed effect coefficients estimate showed that member participation has a significant influence on housing affordability which

is fixed regardless of the entity ( $\beta = 0.065$ ,  $Z = 2.290$ ,  $p\text{-value} = 0.022$ ).

### **6.1.3 Supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya**

The third objective of the thesis aimed to evaluate supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya.

On assessing the effect of supportive environment on housing affordability in housing cooperatives, the optimal model was found to be M1 with level-1 fixed effects and no level-2 random effects on affordability. The model showed a significant fixed effect component (Wald chi-square (3) = 40.04,  $p\text{-value} = 0.002$ ) and significant random intercepts but no random slope. The specific coefficients of each dimension showed that only legislative and policy frameworks ( $\beta = 0.086$ ,  $Z = 2.400$ ,  $p\text{-value} = 0.016$ ) and collaboration and partnership ( $\beta = 0.123$ ,  $Z = 2.570$ ,  $p\text{-value} = 0.010$ ) with  $p\text{-values}$  less than 0.05 had significant fixed effects on housing affordability that exists regardless of the entity. Support services were found to have no significant fixed effect on housing affordability ( $\beta = 0.019$ ,  $Z = 0.470$ ,  $p\text{-value} = 0.637$ ). The  $p\text{-value}$  of the fixed effect coefficient of support services is shown the  $p\text{-value}$  which is greater than 0.05.

### **6.1.4 Influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya**

The study focused on influence of cooperative housing finance on housing affordability in Nairobi City County. Cooperative housing finance factors measurement indicators retained after Factor Analysis (FA) for data reduction and Confirmatory Factory Analysis (CFA).

On assessing the influence of housing finance on housing affordability in the housing co-operatives, the optimal model was found to be M1 with level-1 fixed effects and no level-2 random effects on affordability. The model showed a significant fixed effect component (Wald chi-square (1) = 23.43,  $p\text{-value} = 0.000$ ) and significant random intercepts but no random slope. The coefficient estimates of housing finance towards savings, cooperative loans, government loan and bank loan was found to have a significant fixed effect on housing affordability ( $\beta = 0.082$ ,  $Z = 2.340$ ,  $p\text{-value} = 0.019$ ;  $\beta = 0.128$ ,  $Z = 4.840$ ,  $p\text{-value} = 0.000$ ;  $\beta = 0.107$ ,  $Z = 3.950$ ,  $p\text{-value} = 0.000$ ;

$\beta = 0.065$ ,  $Z = 2.330$ ,  $p\text{-value} = 0.020$ ) respectively that exists regardless of the entity. The p-value of the fixed effect coefficient of housing finance is shown the p-value which is less than 0.05

## **6.2 Conclusions**

The overall finding of the study is that housing cooperative is the most viable and affordable model of owning a home in Nairobi among low-income households.

### **6.2.1 Profiling housing co-operative models in addressing housing affordability in Nairobi City County, Kenya**

In Kenya, the limited housing co-operative model is widely used. This is due to the fact that the bulk of the members find it more affordable to purchase a plot with their limited means. However, a lack of infrastructure and other necessary facilities makes house construction impossible. In addition, financial institutions have put the stringent condition in lending mortgages particularly to low- and middle-income households. Therefore, the study proposes a multiple mortgage co-operative model that will provide affordable housing through regular contribution of savings. Under this model, monthly rent is fixed and paid by the tenants themselves who are the owners at the same time users of the facilities. These kinds of co-operatives are considered fully as housing co-operative because it articulates the importance of member economic participation

### **6.2.2 Housing co-operative member participation and housing affordability in Nairobi City County, Kenya**

The paper concludes by stating that member participation was average, meaning that affordability of housing co-operatives would have increased if the members actively participated in all the co-operative activities. Members participated in decision making process, attendance to co-operative meetings, share contributions, patronizing the co-operative activities and electing the board of directors. This participation had positive impact on the housing affordability. However, members are encouraged to be more committed particularly when making decision that affect their housing business. The study also revealed that some of socioeconomic characteristics had a significant influence on the member participation in the housing co-operatives. The study showed that level of education, monthly income, years of memberships and employment status were significantly strong predictors of member

participation. However, gender and marital status was not a significant predictor in this context.

### **6.2.3 Supportive environment for housing co-operatives in the context of the “current housing affordability” in Nairobi City County, Kenya**

The findings suggest that housing co-operative continue to be important actors in provision of affordable housing. In order to thrive and maintain significant contribution in the provision affordable housing, it requires government support but not to the extent that might jeopardize their independence and autonomy. There are many ways of creating enabling environment for housing co-operatives to flourish. For instance, establishment of legislatives and policies, support services and collaboration and partnership were found critical for continuing growth of housing co-operatives. However, support services were found insignificant in determining housing affordability. Supportive environment for housing co-operatives cannot be achieved by quick fixes or simple formulas. Ultimately is sole responsibility of any government to create conducive environment for business to thrive including housing co-operatives. Establishment of legislative and policies, support services, and collaboration and partnership is not enough, the crucial condition is regular actualization and implementation of very purpose of housing co-operatives by all the stakeholders.

### **6.2.4 Influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya**

The best way to ease Nairobi City County severe housing shortage for low- and middle-income workers is to provide affordable housing financing. The housing co-operative approach provides an avenue for provision of affordable financing to their members. The results indicate that housing cooperative used various sources of finance for housing development which include member Savings, cooperative loans, bank loan and government loans. Member savings was cheapest source of finance because there is no interest charged on the fund. Second is the government loan which charged the lowest interest compared to other sources, followed by cooperative loan and last the bank loan. However, the finding shows that cooperative loan was the most commonly used as source financing affordable housing, followed by savings, government loan and lastly bank loan. This implies that as much as savings and government loans were the cheapest source of finance, they were not sufficiently



enough to cater all the needs for housing development, therefore, members went for cooperative loan and lastly on bank loan. In conclusion, financing cooperative housing through housing cooperatives were found to be relatively cheaper compared to the open market.

### **6.3 Recommendations**

#### **6.3.1 Profiling housing co-operative models in addressing housing affordability in Nairobi City County, Kenya**

From the findings three cooperative housing financing models were identified (limited housing cooperative model, multiple mortgage housing cooperative model and continuing housing cooperative model). The study recommends that the ministry of cooperative, small and medium enterprise should create laws and regulation that will draw a framework for adoption and implementation of the housing cooperative financing models that are missing in the national cooperative policy of 2017.

#### **6.3.2 Housing co-operative member participation and housing affordability in Nairobi City County, Kenya**

Findings shows that members' participation has a positive causal relationship on housing affordability therefore, housing co-operatives need to innovate and strategies on how to attract more members to actively participate in the cooperative activities. The study recommends that the housing cooperatives should continue enlightening members about the importance of participating in the cooperative activities through meetings, trainings seminars and workshops.

#### **6.3.3 Supportive environment for housing co-operatives in the context of the "current housing affordability" in Nairobi City County, Kenya**

Findings shows that supportive environment for housing co-operatives has a positive causal relationship on housing affordability. Implying that housing cooperatives will facilitates more of affordable housing in the presence of enabling environment. The study recommends that the ministry of cooperative, small and medium enterprise to come up with innovative strategies to actualize what is in the policy. In addition, the study recommends addition expertise on housing cooperative operations, financing and management due to high a number of the primary housing cooperatives that are being registered daily and face a number of challenges that are beyond their capability ended up either liquidated or dormant before meeting their objectives.

### **6.3.4 Influence of co-operative housing finance on housing affordability in Nairobi City County, Kenya**

The study found that housing cooperative finance had positive causal relationship on housing affordability as it reduces the cost of capital compared to other financing options whereby members funds, government loans, cooperative loans and bank loans were identified as major sources of housing financing. The study recommends creation of revolving fund for cooperative movement sector to enable members of housing cooperative to access long-term affordable housing finance because national cooperative policy of 2017 lacks affordable mortgage facilities and long-term lending facilities for members of housing cooperatives.

## **6.4 Contribution of the Study**

### **6.4.1 Theoretical contributions**

The concepts of transaction cost economics were used to explain the strategies organizations take to develop strategic partnerships in order to improve organizational performance. The fundamental idea of transaction costs is to ensure that there is flow and sufficient information that inform decision making. Transaction cost theory was coined by Williamson (1975) who defined transaction costs (TC) as expenses caused by internal business operations of firms. The essence of a housing co-operative is to fulfil the needs and wishes of its members. In order to achieve this goal, members are involved in active participation and patronization of services. Active membership with the crucial emphasis on solidarity and acting for the good of the whole community, not just for the benefits of an individual (Sørvoll and Bengtsson, 2018). However, the theory's shortfall arises when there are disagreements between the parties on how to share scarce resources. This weakness led to adoption of other theories in the study. These other theories are: resource dependence theory, collection action theory, and capital structure theory which qualified to bring in light on more factors which would lead housing cooperative to be effective in provision of affordable housing

### **6.4.2 Policy and vision development**

The study established that cooperative policy lacks mortgage facility for members of housing cooperatives that will enable them to access long-term affordable financing for their housing projects. Therefore, the study recommends for development of

mortgage facility that will involve all the stakeholders of the cooperative movement's opinion towards development of legal and policy framework which will encourage the members to save and own the facility.

#### **6.4.3 Debate on of housing cooperative model**

Housing cooperatives are a growing presence in Kenyans housing system, providing a diversity of housing forms to a variety of household types across the income spectrum, typically serving low- and moderate-income households. Kenyan evidence shows that housing cooperatives can provide a range of housing from very low-price points through to market rate in both non-urban and urban contexts.

Housing cooperatives are private legally incorporated entities that provide housing to their members. In Kenya, most members of housing cooperatives hold title to their individual plot or units of their housing in such instances, the housing cooperatives act as a bridge between the land own and the government. The other form of ownership is where residents do not own their homes but own a share in the cooperative and ownership of a share gives the member the right to live in one of the cooperative's homes.

In market cooperative model, shares are sold at the market price because this kind of model rarely receives any aid from the government or other donors. Regardless of the housing cooperatives model one agrees to select, all the housing cooperatives operate according to the international co-operative principles: Voluntary and Open Membership, Democratic Member Control, Member Economic Participation, Autonomy and Independence, Education, Training and Information, Cooperation among Co-operatives and Concern for Community.

#### **6.4.4 Analytical method**

Traditional regression models are often only applicable in non-hierarchical populations and data structures. With hierarchical data structures, statistical models should be able to simultaneously consider the variations within and between the multiple hierarchies. This study considered a 2 level-hierarchical structure of members nested in housing cooperatives. To assess influences considering variations at member levels within the housing cooperatives and the variations between the groups (housing cooperatives), linear mixed effects models were fitted. Linear mixed effect models allow for: correct inferences considering the multiple levels of

analyses, substantive interest in group effects, estimation of between group effects simultaneously with the within groups effects, and inference to population groups that are cannot be achieved by traditional regression models.

A mixed effect regression model was fitted to assess the influence of member participation on housing affordability. The mixed effect model was fitted considering the multilevel structure of the data with 2 levels of analysis of members nested in housing co-operatives. The mixed effect model adopts a hierarchical technique assessing fixed effects at level 1 (respondent/member level) and random effects at level-2 (entity level) and was based on restricted maximum likelihood (REML) estimation technique. The consideration for using REML is due to the unbalanced multilevel structure of the data. The data is considered unbalanced as the number of level-1 within the level-2 units are unbalanced as the housing cooperatives each have varying number of members. Maximum Likelihood techniques could consider either Full Maximum Likelihood (FML) or alternatively the Restricted Maximum Likelihood (REML) estimation techniques due to advantages such as flexibility to handle unbalanced multilevel data. Both techniques generate equivalent fixed estimates but the REML estimations are less biased in comparison to FML.

The models fitted were assessed for the assumptions of normality and homoscedasticity. Assessment of assumptions of mixed effect models should be carried out based on exploratory graphical analysis unlike other linear regression modelling techniques that can be assessed using classical tests. According to Loy et al. (2017) proposed different assessments for level-1 residuals, level-2 residuals and level-1 residuals nested in level-2. They postulated that due to complexity of linear mixed effect (LME) models, traditional diagnostics of linear models are rendered less effective and thus introduced a series of model residual analysis which involved producing charts of residual plot of visible patterns to assess assumptions of LME which were adopted in this study for both level-1 and level-2 residuals. The literature allowing for extension of model assumption techniques used in classical linear models to hierarchical linear mixed effect models is heavily fragmented thus techniques involving visualisation plots of residuals are recommended as to assess the distributional properties of the model residuals at both levels of the data structure (Loy, 2013).

### **6.5 Areas for Further Research**

Based on the findings of this research, the following topics require further research in future studies on housing cooperative. Access to affordable financing for housing development by housing cooperatives has been very difficult, therefore, it is critical and needs extensive investigation by further studies. Among the issues is either how to establish a special cooperative development fund or create an institutional (legal framework) arrangement to facilitate the mobilization of idle capital available at savings or credit cooperatives at different levels for the provision of long-term loans to housing cooperatives

It is also suggested that further research be conducted to explore and establish a tri-modal such as public-housing cooperatives-private sector partnership and collaboration and between different actors to address the manpower, financial, and infrastructural challenges facing housing cooperatives. Housing cooperatives can play an important role in building new partnerships and collaboration models in the sector.

Since the current study was carried out in Nairobi City County, similar studies should be carried out in other counties to establish whether there are similarities or difference. The role of housing cooperative should be investigated in relation to housing cooperative models in different county. There is also need to investigate the challenges faced by the current housing cooperatives to adopt various housing models and adopted strategies.

### **6.6 Limitations/ Challenges of the Study**

**Lack of Generalizability.** The study was conducted in Nairobi County as a case study which their findings cannot be generalized to other countries or regions. However, the study can be replicated to other countries and other 47 counties in Kenya.

**Heavy Traffic Congestion.** The researcher faced challenges during data collection because of heavy traffic jam within Nairobi city which delayed collection of data in time. However, more days were added to cover for the lost time. It was also difficult to get key informants due to their busy schedule, hence, alternative meeting points were scheduled where they were comfortable.

Delays in receiving permits from several local authorities. The researcher waited for longer than expected before receiving research permit from the National Commission of Science, Technology and Innovation (NACOSTI) and the ministry of cooperative, small and medium enterprise before begin of data collection. However, more days were added to cover for the lost time.

**APPENDICES****Appendix I: Introductory Letter****Dear Sir/Madam,****TITLE OF RESEARCH****KENYA HOUSING CO-OPERATIVES AND THE EXTENSION OF  
AFFORDABLE HOUSING FOR THEIR MEMBERS IN NAIROBI CITY  
COUNTY**

This questionnaire is designed to assess the role of housing co-operatives and the extension of affordable housing in Nairobi City County. The study is solely intended for academic purposes and the result will be of high benefit to all stakeholders responsible for, and interested in addressing housing affordability challenges facing the residents of Nairobi City County and Kenya at large through housing cooperatives. Your participation in this data collection process will therefore be highly appreciated. Confidentiality of your response is assured and your anonymity is guaranteed.

**Thank you.**

## Appendix II: Questionnaire for the Members

### Kenya Housing Cooperatives and the Extension of Affordable Housing for their Members in Urban Areas. A Case Study of Nairobi City County

#### Questionnaire for the Members

##### SECTION A: GENERAL INFORMATION

1. Name of co-operative.....
2. Location of co-operative.....
3. State the year the cooperative was registered .....
4. State your designation .....
5. What is your gender? Female  Male
6. How long have you been a member of this cooperative? Under 2 years  2-4 years  4-6 years  6-8 years  8-10 years  Above 10 years
7. State your age bracket? 18-20 years  20-30  31-40  41-50  51-60  >60
8. State your marital status? Single  Married  Divorced  Widowed
9. State the highest level of education achieved? Primary  Secondary  Certificate  Diploma  Bachelors  Masters and above
10. The employment status Civil servants  Private sector  Self-employed
11. What is your income range?
  - Below Ksh. 10,000
  - Ksh. 10,000 - 50,000
  - Ksh. 50,001-100,000
  - Ksh. 100,001-150,000
  - Above Ksh. 150,000

##### Section B: Level of Member Participation in the Housing Co-operatives Activities

Indicate the level of participation in your co-operatives in the following activities of the housing development?

Likert scale (Never-1, Rarely-2, Moderate-3, Often-4, Always-5)

S/No	Activity Areas	Always	Often	Moderate	Rarely	Never
		(5)	(4)	(3)	(2)	(1)
1	Attending meetings					
2	Electing board of directors					
3	Payment of housing co-operative dues					
4	Participation in making Bylaws					
5	Recruitment of new members					
6	Development of cooperative systems					
7	Approval of annual budget					
8	Making regular contributions/savings					



9	Participation in project appraisal					
10	Attending education and training					
11	Attending exhibition and workshops					
12	Participation in project maintenance					
13	Development of strategic plan					
14	Raising funds for co-operative					
15	Provision of security services					
16	Participation in selection of project site					
17	Participation in project execution					
18	Project planning and design					

### Section C: Supportive Environment for Housing Co-operatives

From the statements, tick the option that best describes your opinion on each of the issues stated on supportive environment for cooperatives

Likert scale (1-strongly disagree, 2-disagree, 3-neutral and 4-agree and 5-strongly agree).

S/No		<b>strongly agree.</b>	<b>agree</b>	<b>neutral</b>	<b>disagree</b>	<b>strongly disagree</b>
		<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>
	<b>Policy and Legislation</b>					
1	Development of financial policy for housing co-operatives					
2	Formation of national housing co-operative policy					
3	Digitalization of land systems					
4	Provision of tax discounts for co-operative housing					
	<b>Support Services</b>					
5	Strengthen the Apex body					
6	Publicity of housing co-operatives					
7	Development of policy for people with special needs					
8	Efficient registration of housing co-operatives					
<b>9</b>	<b>Collaboration and Partnership</b>					
10	Provision better infrastructure support and services for co-operatives					
11	Provision of technical and					

	financial Aid					
12	Collaboration with Kenya mortgage refinance company					
13	Provision of public land for co-operative housing development					

#### **Section D: Sources of Cooperative Housing Finance for Housing Cooperatives**

Kindly rate the extent to which the following sources of cooperative housing finance were employed by housing cooperatives?

Likert scale (1- not important at all, 2-less important, 3- important, 4-slightly important, and 5-most important)

	<b>Sources of Cooperative Housing</b>	<b>Most important</b>	<b>slightly important</b>	<b>Important,</b>	<b>Less important</b>	<b>Not Important at all,</b>
		<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>
<b>A.</b>	<b>Member savings</b>					
1	Savings is the core primary financing means for housing development					
2	Savings act as Collateral					
3	Savings mobilize resources for future investments					
4	Shares investments use as a revolving loan fund					
5	Savings reduce the cost of financing (No interest charged)					
6	Savings boost one to access more credit					
<b>B.</b>	<b>Cooperative Loan</b>					
7	Cooperative loans have the lowest interest in the market					
8	Cooperative loans are secured by members savings					
9	Cooperatives offer friendly and affordable loan repayment plan					
10	Cooperatives members can own a house before paying fully					
11	Cooperative loans are long term financing					
12	No collateral is required in obtaining cooperative loan					

<b>C.</b>	<b>Government Loan</b>					
13	Government loan reduces the cost of construction for cooperative housing					
14	Government grants offset loan repayment					
15	Government loan build infrastructure and other amenities					
16	Government loan is adequate to finance cooperative housing					
17	Government loan acquire land for cooperative housing development					
18	Government loan used for renovation and maintenance of coop homes					
<b>D.</b>	<b>Bank Loan</b>					
19	Bank loan requirements are friendly to low-income earners					
20	Background checks is not mandatory for one to access bank loan					
21	It takes a short period in obtaining bank loan					
22	Bank loan is a friendly to housing cooperative members					
23	The interest charged on loan is friendly and affordable to low income					
24	Bank loan has lower transaction cost in the market					

### Section E: Indicators of Housing Affordability

How do you rate the significance of the following housing affordability indicators employed by your housing cooperatives?

Likert scale (1- not important at all, 2-less important, 3- important, 4-slightly important, and 5-most important)

S/No	Indicators of housing affordability	Most important	Slightly Important	Important	Less important	Not Important at all
		(5)	(4)	(3)	(2)	(1)
1	Land Acquisition					
2	House Finishing					
3	Safety and security of properties					
4	Leasehold / Freehold House					
5	Heating systems					
6	Playground and green area					
7	Near to public schools					
8	Near to public transport					
9	Type of the roof					
10	Near to health care centres					
11	Type of Pavement used					
12	Status of the Neighborhood					
13	Materials and waste management					
14	Indoor environmental quality					
15	Near to shopping facilities					
16	Status of the location					
17	Traffic Congestion					
18	Access to leisure facilities					
19	Interest rates and mortgage availability					
20	Near to workplace					
21	Type of buiding technology					
22	Near to child care facilities					
23	Water and Energy efficiency					
24	Recreational facilities					
25	Plot layout					
26	Size of the House					

**Appendix III: Semi Structured Interview Guide for Key Informants****Questions:**

1. Please introduce yourself and tell us a little bit about housing co-operative and the work that you do? (Position, experience and current employment.)
2. Describe how the housing cooperative is established?
3. What was the main objective of the housing cooperatives? Is buying land only? Is buying land and building?
4. Describe the criteria of used by housing cooperative to admit new members into housing cooperative? (Education level, economic, social, organisation affiliations)
5. Describe the process of ownership of the housing units by members of housing cooperatives? (Ownership by shares or title deed)
6. Describe the methods or approach used by housing cooperative in delivering housing units to members? (One per time, collectively or individually)
7. Describe how the housing co-operative is financed? (Member savings, loans, grants, revenue)
8. Describe the criteria used by lenders to finance housing cooperatives?
9. Describe the how the housing cooperative manage their property? (Maintenance and repairs, collection of service charges and provision of security)
10. Describe how members are involved in management of their housing cooperative? (Electing the leaders, decision making, meetings)
11. Describe the benefits and challenges of forming housing cooperatives in Kenya?
12. Are there any final comments, suggestions or thoughts that you would like to share about the housing co-operative?

**Thank you for Participating in this Study**

**Appendix IV: Sampled list of Registered Housing Cooperatives in Nairobi city  
County**

<b>S N</b>	<b>CS/NO</b>	<b>NAME OF SOCIETY</b>
1	6089	Balozi Housing cooperative
2	6951	Chuna housing cooperative
3	14570	Ukulima Housing cooperative
4	6325	Habitat Housing cooperative
5	8855	Forest View Housing cooperative
6	12633	Shirika housing cooperative
7	10997	Wanandegge Housing cooperative
8	17933	B.A.T housing cooperative
9	15941	Hazina Housing cooperative
10	13941	Royal Housing cooperative
11	9477	Kithino Housing cooperative
12	11546	Biblia Housing cooperative
13	14966	Tai Housing cooperative
14	15406	Ukaguzi Housing cooperative
15	7306	Nachoco Housing cooperative
16	12800	Kanisa Housing cooperative
17	15620	Sheria Housing cooperative
18	13525	ICEA Housing cooperative
19	14272	DHL Housing cooperative
20	16281	ACCEL Housing cooperative
21	7802	Kenindia Housing cooperative
22	12167	Adventist Housing cooperative
23	13575	NACICO Housing cooperative
24	14106	Nairobi Teachers Housing cooperative
25	14071	Dodcon Housing cooperative
26	13812	Karemen Housing cooperative
27	9877	Mater Housing cooperative
28	14235	Chai Housing cooperative
29	12728	APS Baraka cooperative
30	15753	Kawi Housing cooperative
31	14516	Bingwa Housing cooperative
32	14276	Kenhurt Housing cooperative
33	13898	Kianjahi cooperative
34	13997	Vista Housing cooperative
35	16397	Urithi cooperative

**Appendix V: The African Journal of Co-operative Development and Technology Vol 6 No 2 (2021):**

**Housing Co-operatives Member Participation and Housing Affordability in Nairobi County, Kenya**

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**Abstract**

*Member participation is an active process in which people take initiatives and actions stimulated by their thinking and deliberation, which affect co-operative performance. Nevertheless, low member participation in housing co-operative is the biggest challenge facing housing co-operatives. This paper examined the following objectives; to determine the social-economic characteristics affecting member participation in a housing co-operative, to analyze housing affordability indicators, to describe the level of member participation in the housing co-operatives, and to examine the influence of members' participation on housing affordability in housing co-operatives in Nairobi County, Kenya. Data was collected from 35 housing co-operatives societies registered under the state department of co-operatives in Nairobi County. The paper collected both primary and secondary data and was analyzed both descriptively and inferentially. Hypothesis testing was analyzed by mixed-effects model and correlation analysis. The result reveals that socioeconomic characteristics influence member participation in housing co-operative also, there was a significant relationship between member participation and housing affordability. Therefore, the paper recommends continuous provision of education and training for existing and incoming members to enlighten them about their democratic rights entrenched in co-operative principles and bylaws. Also the State Department of Co-operatives should sensitize co-operative members on the importance of active participation in the co-operative organization.*

**Keywords:** Participation, Co-operatives, Affordability, Housing deficit.

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**INTRODUCTION**

A world where only a few people can afford housing is not a sustainable one to live in as affordable housing offers an excellent quality of life and personal fulfillment opportunities such as social, environmental, and economic aspects (World Economic Forum, 2019). The provision of safe and adequate housing in most cities has been the major challenge facing societies. According to the United Nation human rights report of 2020, it indicates that 1.8 billion people live in life-threatening structures and sometimes lack even a toilet, many due to unresponsive housing supply and scarcity of affordable

housing (UN-Habitat, 2020). Bredenoord (2016) noted that the most pressing needs of affordable housing are on low-income households. Therefore, it is apparent that housing shortages cannot be solved without focusing on affordable housing.

As a result of active participation and growing housing needs and speculation in the market, it led to the rise of an alternative co-operative housing model (Visković *et al.*, 2020). International Co-operative Alliance (2018) defines a housing co-operative as a group of people united to provide affordable housing through democratic member control. Housing co-operatives are own private

**Appendix VI : Journal of Co-operative and Business Studies (JCBS) Vol. 6,  
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**SUPPORTIVE ENVIRONMENT FOR HOUSING CO-OPERATIVES IN THE  
CONTEXT OF THE "CURRENT HOUSING AFFORDABILITY" IN NAIROBI COUNTY, KENYA**

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**ABSTRACT**

Governments have recognised the contribution of housing co-operatives towards alleviating housing shortage while contributing to the social economic, cultural and political progression of their community and nation at large. This has prompted a need for deeper understanding of supportive environment for housing co-operatives in provision of affordable housing. Specifically, the paper aimed to determine the supportive environment for housing co-operatives and examine the relationship between supportive environment for housing co-operatives and housing affordability. The paper adopted cross sectional research design employing both quantitative and qualitative approach. Multistage sampling technique was used to select the 387 members from the 35 housing co-operatives selected. The collected data were analysed with both inferential and descriptive statistics, the descriptive statistics include frequency, simple percentage and mean, while inferential statistics used was multiple regression analysis. Test of hypotheses were analysed through mixed effect model and correlation analysis. The finding reveals that policy and legislative, collaboration and partnerships had a significant effect on housing affordability with P-value of 0.016 and 0.010 respectively. On the other hand support services had insignificant effect on housing affordability with P-value of 0.637 which is greater than 0.05. The study concludes that it's ultimately the sole responsibility of government to create conducive environment for housing co-operatives to thrive, however not to the extent of interfering with its independence. The study recommends that the state department of co-operatives should organise workshop for stakeholders to participate in reformulating and restructuring of the current legislative and policy framework.

**Key words:** supportive environment, housing affordability, cooperatives.

**1.0 INTRODUCTION**

A cross the world, most governments have withdrawal from direct supply of affordable housing. As a result, the inability of private sector to provide sufficient housing units to low income groups has led to rediscovery of housing co-operatives as potential strategy to counter ever-increasing demand for affordable housing (Barenstein, *et al.*, 2021, Baiges *et al.*, 2020, Madden and Marcuse, 2016). Dwayne Barenstein and Sanjinés (2018) indicated that housing co-operatives globally known as alternative housing model for provision of decent and affordable housing. UN-Habitat (2019) report that adequate housing is a basic human need and is part and parcel of everyone's right for adequate standard of living. Despite its importance, it is estimated that over 1.6 billion people globally live in inadequate housing while 2million people every year are forcibly evicted, and 150 million people are homeless (UN-Habitat, 2020).

The housing co-operatives can be a solution in provision of affordable housing as well as creating economic incentives and social opportunities for its members (Lipej and Turel, 2018). The International Cooperative Alliance (2012) defined housing co-operative as housing model mutually owned and democratically controlled by its members for the purpose of provision of housing needs at affordable rate. According to Czischke, (2018) observed that bottom-up approach for innovative housing projects in most Europeans countries were been implemented by housing co-operatives. In addition, housing co-operatives achieved social goals such as

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