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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**

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). Dwyne 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 2 million 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 European countries were been implemented by housing co-operatives. In addition, housing co-operatives achieved social goals such as

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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) argued that it is not government's job to deliver housing but to provide conducive environment at which housing market can work effectively. Further, Groeneveld (2016) stated that enabling environment for co-operatives is 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 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 %). As noted by Gruber and Lang, (2018) and Lang *et al.*, (2018) conducted survey in five countries (France, the Netherlands, Germany, Austria and the UK) found that policies, regulation and practices were given much emphasizes in provision of affordable housing.

Ganapati (2014) found that government support was critical resource in terms of access to land and subsidised financing boosted the formation of housing co-operatives in Senegal. Huba (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. In addition, Huba (2016) noted that of in appropriate housing policies affected the performance of housing co-operatives. Marunga and Mberengwa (2014) noted 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) argues 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 make 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 implies 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 (Cabre and Andres, 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 (2021) argue that appropriate legal and policy mechanisms promote housing co-operatives in accessing affordable housing. While 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 was 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 Voellmecke (2011) argued that women in housing co-operatives have been excluded from participating in provision of affordable housing. 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 have not been studied together in one study by previous studies. Last, 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 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.

$H_0$ : Supportive environment for housing co-operative has no significant effect on the housing affordability.

## 2.0 THEORETICAL UNDERPINNINGS

The study was guided by a Resource Based 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) noted that dependencies of resources created ascertain level of risks and uncertainty that affected the organisational efficiency and effectiveness. However, Pfeffer & 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 is share by Van Bortel *et al.*, (2018) government support mechanisms such as subsidies, asset transfer and tax incentives are crucial resources for attainment of affordable housing.

## 3.0 METHODOLOGY

The study was conducted in Nairobi county because it hosts the highest number of housing co-operatives (115) and with 500,000 membership compared to other counties (state department of co-operatives 2020).Also, Nairobi 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-method 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 county at one point in time which considered to be useful where resources are imitated (Jogulu & Pansiri,2011).

The target population in this paper consisted of members of housing co-operatives in Nairobi 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 394 members from 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 registered of each housing co-operative. The sample size of 394 members was determined based on the sampling formula for a finite population given by;

$$n = \frac{N}{(1 + (N \times e^2))} \dots\dots\dots 1$$

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.

A structured questionnaire was designed to collect information about the effect of a supportive environment for housing cooperatives on housing affordability. A total of 387 copies of the questionnaire were administered to the members of 35 housing cooperatives. In addition, qualitative data were collected using Key Informant Interviews (KIIs) and documentary review. A total of 10 KIIs were selected based on knowledge, experience and position they held in their respective organisations 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).

Data analysis was based on regression models 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 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 and used 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.

$$\omega_i = \frac{\bar{X}_i}{\sum_{i=1}^{18} \bar{X}_i} \times 100 \dots\dots\dots 2$$

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 (level-1) towards extension of affordable housing by housing co-operatives (level-2) 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;

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

$$\gamma_{0j} = \beta_{0j} + \mu_{1j} X_{1,ij} + \mu_{2j} X_{2,ij} + \mu_{3j} X_{3,ij} + \mu_{0j} \dots\dots\dots 4$$

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

$$Y_{ij} = \beta_{0j} + \beta_1 X_{1,ij} + \beta_2 X_{2,ij} + \beta_3 X_{3,ij} + \mu_{1j} X_{1,ij} + \mu_{2j} X_{2,ij} + \mu_{3j} X_{3,ij} + \mu_{0j} + \varepsilon_{ij} \dots\dots\dots 5$$

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 Legislative and policy framework as viewed by member i nested in co-operative j;  
 $X_{2,ij}$  is the Government support as viewed by member i nested in co-operative j;

$X_{3,ij}$  is the Collaboration and Partnership 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.

## 4.0 FINDINGS AND DISCUSSION

### 4.1 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 (Table 1.).

**Table 1: Supportive Environment for Housing Co-operatives**

Variable	Mean	Std.	CV
<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 findings in Table 1 show 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, and22% respectively, digitalization of land systems with a mean, standard deviation and coefficient of variation of4.097,0.983and 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 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. This is implying that collaboration and partnership help the housing co-operatives to provide affordable housing for their members.

#### 4.2 The Influence of Supportive Environment on Housing Affordability

A 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 into 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 with was 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 4.6. 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;

$$Y_{ij} = 1.886 + \gamma_{0j} + 0.086X_{1,ij} + 0.123X_{2,ij} + \varepsilon_{ij} \dots \dots \dots 6$$

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

**Table 2: Regression model of supportive environment and housing affordability**

Mixed-effects REML regression		Number of obs	=		361	
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	
Affordability (Y)	Observed Coef.	Bootstrap Std. Err.	z	P>z	Normal-based [95% Conf. Interval]	
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	
Random-effects Parameters	Observed Estimate	Bootstrap Std. Err.	Normal-based [95% Conf. Interval]			
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	
Model	Obs	ll(null)	ll(model)	df	AIC	BIC
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 were 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.**

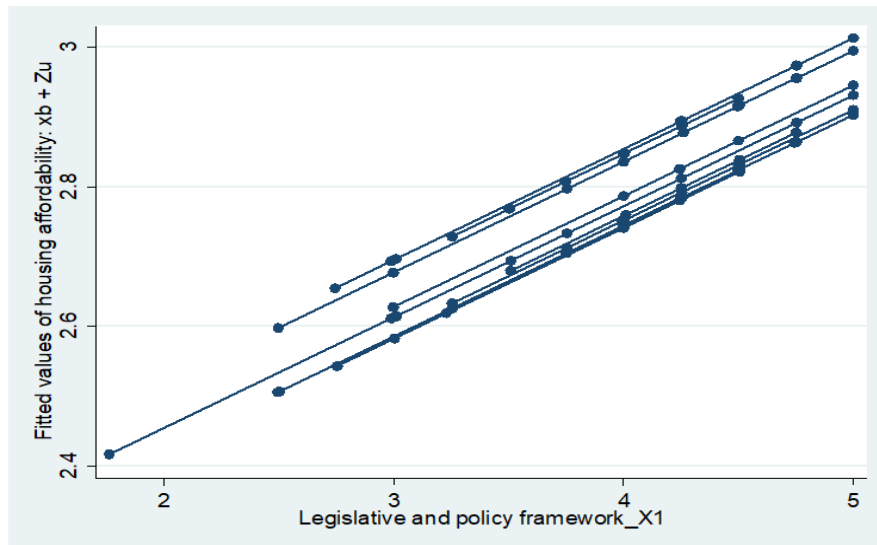
The p-value of the Wald chi-square statistic was less than 0.05. The null hypothesis was thus rejected and a conclusion drawn that supportive environment has a significant effect on the housing affordability of housing co-operatives. The effect is however fixed within all the housing co-operatives as 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 1 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) 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, Nairobi,).

There is a lot 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.



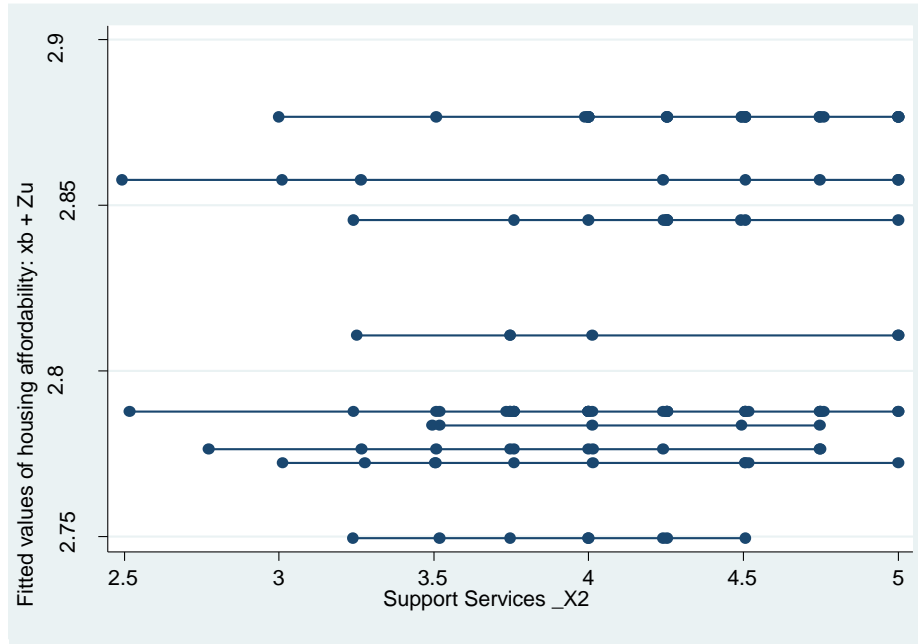
**Figure 1: Mixed model of housing affordability against Policy and legislations.**

Figure2 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:

*“.....Having an umbrella body for housing co-operatives in Kenya is a great achievement particularly in lobbying, advocacy and provision of technical support for primary housing co-operatives.....”* (Interview, Nairobi,).

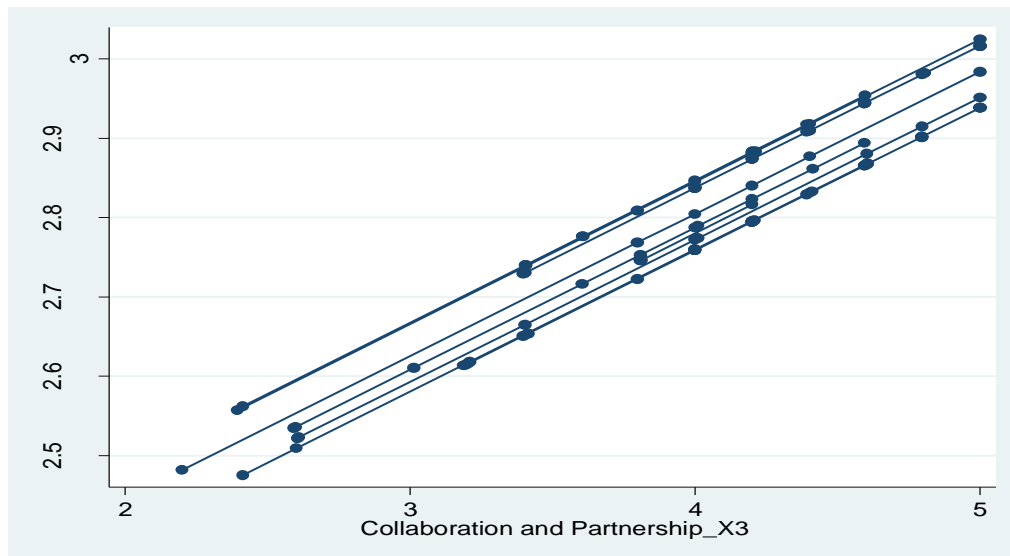
The main argument for this key informant was that support services are critical for prosperity and growth of housing co-operatives. Studies conducted by Steinman (2020) noted that support services for housing co-operatives facilitated regional, national and global network, training and registration of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





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

Figure 3 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) found that collaboration and partnership reduced the total cost of affordable housing. Contrary to 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 3: Mixed Model of housing affordability against collaboration and partnership.**

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

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 of 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 actualisation and implementation of very purpose of housing co-operatives by all the stakeholders.

### 5.2 Recommendations

The existence of supportive environment for housing co-operatives is considered essential to stimulate economic growth and development in housing sector. First, the state department of co-operatives should organise workshop for stakeholders to participate in reformulating and restructuring of the current legislative and policies to address the emerging issues in housing sector such as income mixing and diverse equity arrangements. Second, National Co-operative Housing Union (NACHU) as apex organisation for housing co-operatives can work to ensure supportive legal and regulatory framework for affordable housing is realised through lobbying, advocacy and networking. Third, state department for co-operatives and other government agencies are required to ensure that housing co-operatives are provided with better infrastructure and other support services through collaboration and partnerships. Further research into the socio-cultural and political factors surrounding housing co-operative development is still required to fully comprehend the co-operative development phenomenon.

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