



## EFFECT OF HOUSEHOLD INCOME ON THE AFFORDABILITY OF HOUSING IN NAKURU EAST AND NAKURU WEST SUB-COUNTIES, NAKURU COUNTY, KENYA

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### Abstract:

This study investigated the impact of household income on housing affordability for low-income households in Nakuru East and West Sub-Counties, Kenya. Using a mixed-methods approach with questionnaires for 384 systematically sampled households and interviews with purposively selected housing sector managers, the study found that low-income households had unstable and insufficient incomes, limiting their ability to afford housing. Correlation analysis revealed a moderate positive and significant relationship between household income and housing affordability ( $r=0.440$ ,  $p<0.05$ ). The study concluded that lower household incomes contribute to housing affordability challenges, especially with rising house prices. It recommended policies to increase incomes, provide targeted housing subsidies and financing, develop affordable housing stock, and combine housing assistance with financial literacy education.

JEL: R21, R31, I31, D31, O18

**Keywords:** household income, affordability of housing

### 1. Introduction

Pricing on houses, both as rent and purchase terms, is generally on the rise. In most developing countries, the average increase in pricing is around 5% annually. As the demand for housing increases significantly, the price of houses is likely to respond directly due to the law of demand and supply (Milwicz & Nowotarski, 2015). In an attempt to achieve housing affordability in most nations, pricing has been identified as

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one of the determinants of housing affordability. Empirical literature shows that house price is a significant determinant of the affordability of housing across the globe (Erdmann, Furth, & Hamilton, 2019; Leng, Malek, & Yasin, 2017; Kgobetsi, 2017; Milwicz & Nowotarski, 2015). In a study based in the United States, Erdmann *et al.* (2019) examined the role of house prices on affordability of housing. While observing that prices in closed-access cities in America with new housing development are closely regulated, the study revealed that high house price is a major challenge to the housing development within these closed-access cities. Similarly, Achilles Kallergis *et al.* (2018), in a study that sampled 200 cities across the world to evaluate the affordability status of median-income earners, established that high house prices are the most significant barrier to owning houses with desired features.

The study reported an average house price-to-income ratio of between 4.9 and 6.3, implying a low income level among most city dwellers. The study further found that informal settlements and public housing were affordable to most median-income earners.

## 2. Specific Objectives

To evaluate household income's effect on housing affordability in Nakuru East and Nakuru West Sub-Counties, Nakuru County, Kenya.

## 3. Research Hypotheses

**H<sub>0</sub>:** Household income has no statistically significant effect on housing affordability in Nakuru East and Nakuru West Sub-Counties, Nakuru County.

## 4. Literature Review

Related findings were reported by Anthony (2018) in their study on economic prosperity and housing affordability. Through a meta-analysis of housing and economic reports for 25 years, the study revealed an acute shortage of reasonably-priced houses in many states in the country. The study established that over 35% of the residents paid more than 30% of their income for their housing costs. However, it was found that neither economic prosperity nor poverty alleviated the cost of house prices. Similarly, no significant differences in house affordability were reported between medium-income and low-income residents. The study recommended that policymakers and planners formulate new policies to address the shortage of affordable housing in America in an effective manner. Still, in the USA, O'Connor (2018) examined that 30% of city dwellers in most states had lower than the median income while the rental prices were rising each year with an average rate of 17% per year. Among the sampled states in the USA, Florida was found to have the majority of the people who could not afford the rent for the housing units around. The sampled respondents indicate that housing vouchers, public housing, and project-based subsidies reduced the competition for housing among the extremely

low-income population. Consequently, the study recommended a fast response by the government during the recession of the economy.

In their study on a variety of housing crises in the major cities conducted in the UK, Switzerland and the US, Hilber and Schhni (2016) reported that the house prices in the three counties were high beyond the reach of the majority of residents. The income-to-price ratio of houses was low, thus reducing the purchasing power of houses for most of the residents. The study also found that the housing policies were unfavorable due to more housing permits and regulations, thus increasing the price of the house. Still in the UK, Fingleton, Fuerst and Szumilo (2019) in a study on the impact of housing supply on housing affordability revealed that the supply of housing did not significantly affect housing affordability as much as house prices affected it. The study found that with an upsurge in the house prices for houses with deserted features and localities, the affordability metrics reduced significantly. The study further showed that an increase in wages and an increase in employment did not affect the affordability of houses with constant or increasing prices.

In Malaysia, a number of studies have been conducted on price and housing affordability. Leng *et al.* (2017) examined housing affordability aspects within Penang Island. The study examined existing secondary literature on the affordability of housing within the island and established that increasing house prices, as fueled by the declining stock of land, lead to high land prices and, consequently, high house prices. The study also reported that a limited supply of land was leading to higher house prices than the affordability levels of middle- and lower-income classes. It was evident that diverse affordability criteria can be utilized, including income affordability, repayment affordability and purchase affordability. The study further showed that purchase affordability depends on the availability of sufficient funds, and repayment affordability depends on the ability of the household to afford to make repayments towards a mortgage instalment. In contrast, income affordability looks at the ratios between the income and the house prices.

Leng *et al.* (2017) found that between 2005 and 2010, house prices in Penang houses had escalated by over 53.9% due to the land prices on the island. The house prices were thus found to be between 200%-800% on the island compared to the mainland in Malaysia. House prices have continually increased above the reach of most of the residents due to the stagnation in income levels, which has led to a disproportionate ratio between house prices and income ratios. The challenge of the house prices on the affordability of housing in Malaysia as documented by Leng *et al.* (2017) and Saikah *et al.* (2019) are consistent with the results of (Soffian, Ahmad, & Rahman, 2018; Ang, Olanrewaju, Chia, & Tan, 2017; Yap & Ng, 2017; Almi & Husin, 2017; Baqutayan, 2016; Ismail *et al.*, 2015) amongst others that also identified price as a significant determinant of housing affordability.

In a separate study, Yin *et al.* (2017) explored the problem of housing affordability with respect to house prices. The study used regression analysis to establish the influence of house prices on the affordability of housing among low-income households in

Malaysia. The study revealed that house pricing had a significant influence on the affordability of housing among low-income households in the country. With respect to this, the study revealed that an increase in house prices led to a decrease in the uptake of houses built by the government for its citizens. Still in Malaysia, Salleh, Yusof, Johari and Talib (2015) explored the affordability of rent among low-income earners in Ipoh City Council Public Housing. The study used stratified random sampling to select 350 respondents to participate in the study and used questionnaires to gather data for the study. The study revealed that the high cost of rent for most houses reduced the affordability of public houses among the residents. The study further found that the financial standings of the residents were also significant predictors of house rent affordability. The study recommended that the management of public housing reduce the rent prices to allow more residents to afford decent housing for their families.

Lastly, Ahmad, Sapiri, Bakun, Hashim and Halim (2019) examined the dynamics of housing models in Malaysia and identified a shortage of affordable houses by the residents, especially those with low income as a problem. The study established that the ratio of income to house price was high for most individuals, thus implying that house prices exceeded 80% of the residents' income levels. The study further revealed that informal housing was more attractive to the low-income earners. The study recommended the reduction of house rents and prices through a re-evaluation of the costs of most houses with respect to the purchasing power of the majority of the residents.

Focusing on the low-income people in Bangladesh, Haque and Aktar (2016) examined the role of pricing in housing aspects. The study that relied on a meta-analysis of empirical literature found that high prices of land and land rates and costs of construction were pushing the houses' pricing beyond the affordability limit of a large number of low-income persons. It was clear that the land-to-price ratio was very high, leading to many years of income required for the land to be affordable. Similarly, in the Netherlands, Dewilde (2018) examined the level of housing affordability among low-income private renters. In the study, affordability was measured as the ratio between income and the price of housing. The study found that 40% of the population could not afford to rent houses due to the high prices of houses, while most of the house prices were more than 30% of the disposal income by the residents. The study further found that a unit increase in house prices reduced house affordability by 0.740 units. It was recommended that the reduction of house prices be worked on by private developers as well as the construction of affordable houses by the government.

A study to establish whether house prices were a contributor to housing affordability among the average income earners in San Francisco by Baranoff (2016) revealed that house price is a significant predictor of housing affordability. An increase in house prices reduced the ability of households to afford a house in the desired size and neighborhoods. Further, the study revealed that the prices were affected by many factor factors, such as the income level of the households and interest rates. The study recommended that house prices be reduced through the reduction of contributors such as interest rates, land prices, and construction costs. In a related study in China, Clement,

Cheng, and Hong (2018) identified high land prices as one of the factors that influenced house prices and speculative investment leading to high house pricing. Other challenges included the high house price-to-income ratio, making most housing facilities available unaffordable. The study was a meta-analysis that depended on the secondary literature for the analysis of the housing problem in China.

In Canada, Matheson (2018) examined the effect of house prices on the affordability of housing among low-income earners. The study found that high prices were attributed to unfavorable taxation policies in construction inputs, thus increasing house prices and reducing affordability of housing to low-income earners. Similar findings were reported by Sohaimi *et al.* (2017) in Malaysia, where young professionals are not able to afford desired housing due to high house prices. Habitat for Communities reported that prices still remain beyond reach for most households both in middle- and low-income brackets. The challenge is global and requires a collective approach if the dream of housing affordability is to be realized.

In Nigeria, Femi (2017) examined house price as one factor influencing housing affordability aspects in the country. The study collected data using a structured questionnaire for the quantitative data. Findings of the study indicated that housing price influences housing affordability and that other factors influencing house affordability include; location of the housing, land prices, and provision of infrastructural facilities for the housing aspects. Similarly, Ahmed and Sipan (2019) Still, in Nigeria, it was established that the lack of reasonable housing financing options was a hindering factor in house affordability. These studies indicate that house prices in Nigeria increase significantly due to the challenges of financing amongst developers, which leads to affordability challenges. Akinyode (2018), in a study to examine consumer inclusion in the affordability of housing in Nigeria, pricing was identified as a challenge. These findings indicate a serious need by the government and other stakeholders to find sustainable ways of lowering house prices to affordable levels.

In Ethiopia, Dires (2015) investigated the level of affordability of government-built housing among middle- and low-income households. Data for the study was collected from 550 respondents. A t-test indicated that the reduction of initial payment and the instalments increased the level of affordability and that instalment rates for the government house were a hindrance to house ownership among middle and low-income households. The respondents indicated that if the initial down payment could be reduced and the periodic instalment amounts lowered, they could be able to afford the houses built by the government. This, therefore, indicates that the affordability of housing is low among low-income households.

In the Kenyan perspective, Mutisya's (2015) established that house price is a factor determining housing affordability among households and that house price is affected by interest rates of mortgages. The study recommended the reduction of house prices through government initiatives to cap the house prices by both the public sector and the private sector, as well as through the building of affordable houses. The study also recommended reducing interest in housing in fiancé institutions in order to increase the

affordability of housing among households. A report by Citibank revealed that most Kenyans are unable to afford the houses on offer. In support of these findings, the high prices set by investors make it difficult even to access financial support. Such high prices translate into expensive loans that require high repayment amounts that are not affordable to low-income households.

#### 4. Research Methodology

This study adopted the positivist research philosophy. In this study, the positivist research philosophy was adopted since the study sought to undertake hypothesis testing with respect to the financial factors, including household income, that affect the level of affordability of housing among low-income households in Nakuru East and West Sub-County, Kenya. This study utilized the correlational research design. According to Gathii *et al.* (2019), correlational research design seeks to describe and measure the degree of relationship. This comprises the strength, direction and significance of the relationship. This research design was applied to this study as it sought to examine the effect of household income on the level of affordability of housing.

The target population for the study were 392,587 households from the lower-income sector of Nakuru East and Nakuru West Sub-counties, including those who rent housing and those who are homeowners, according to the population and housing census of 2019. It was assumed that each household had one figurehead, making each household a unit of analysis. Table 1 presents the number of households in Nakuru Town West and Nakuru Town East Sub Counties.

**Table 1:** Number of households in Nakuru Town West and Nakuru Town East Sub Counties

Sub County	Ward	Number of Households
Nakuru Town West	Barut	9,350
	London	27,037
	Kaptembwa	95,811
	Kapkures	12,099
	Rhonda	33,381
	Shaabab	20,983
	<b>Total No. of Households</b>	<b>198,661</b>
Nakuru Town East	Biashara	35,269
	Kivumbini	27,993
	Flamingo	42,628
	Menengai	41,813
	Nakuru East	46,224
	<b>Total No. of Households</b>	<b>193,926</b>
	<b>Population Size</b>	<b>392,587</b>

Source: KNBS 2019.

The study also targeted housing stakeholders in mortgage financial institutions, housing cooperative societies, real estate developers, and agents operating in Nakuru County. 80 stakeholder institutions in the two sub-counties formed part of the target population.

The sample frame for this study was the household heads in the two sub-counties. Either male or female heads of households in the specific wards in Nakuru East and West Sub-County formed the sample frame. Therefore, the sample frame for household heads was 392,587 household heads (one household head per household) distributed per ward, as presented in Table 2.

**Table 1: Number of Household Heads**

Sub County	Ward	Number of Households
Nakuru Town West	Barut	9,350
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	<b>No. of Households Heads</b>	<b>193,926</b>
	<b>Sample Frame</b>	<b>392,587</b>

The study also used vital stakeholders, including mortgage financial institutions, housing cooperative societies and real estate developers and agents operating in Nakuru County, to provide information on the affordability of housing in relation to the level of income levels of households, house prices, cost of financing, and financial management skills of households. In this case, the study considered every institution as a unit of analysis. To avoid data duplication, one official engaged in housing development was targeted by the study, giving a sample frame of 80 respondents, as presented in Table 3.

**Table 3: Categories of Key Housing Stakeholders**

Stakeholder Category	Number
Financing Companies	1
Housing Cooperatives	3
Commercial Agencies	70
Construction Companies	6

The sample size for household heads was selected using the Cochran (1977) formula developed to calculate a representative sample for an infinite population. The infinite population formula is as shown below;

$$SS = \frac{Z^2 \times (p) \times (1 - p)}{C^2}$$

$$= \frac{1.96^2 \times (0.5) \times (1-0.5)}{0.05^2}$$

$$= 384.16$$

Where;

SS = Sample size,

Z = Z-value (1.96 for a 95 % confidence level),

P = Percentage of population picking a choice, expressed as decimal,

C = Confidence interval, expressed as decimal (e.g., .05 = +/- 5 percentage points).

Therefore, a sample size of 384 was used for this study based on the formula above. The wards accommodate a population of residents by default conceptualized by the geographical locations; therefore, proportionate sampling was used to select the adequate size sample from each ward. The allocation formula for proportionate sampling ( $\frac{x}{N} \cdot n$ ); where x-ward size, N-sub county population and n-sample size were applied for all wards (Hall, 2015). The sample size per ward was therefore obtained as presented in table 4 below

**Table 2: Sample Size per Sub County Ward**

Sub County	Ward	Sample Size
Nakuru Town West	Barut	9
	London	26
	Kaptembwa	94
	Kapkures	12
	Rhonda	33
	Shaabab	21
	<b>Sample Size for Nakuru Town West</b>	<b>195</b>
Nakuru Town East	Biashara	34
	Kivumbini	27
	Flamingo	42
	Menengai	41
	Nakuru East	45
	<b>Sample Size for Nakuru Town East</b>	<b>189</b>
	<b>Total Sample Size</b>	<b>384</b>

The sample size for the housing stakeholders was determined using purposive sampling where managers for the stakeholder companies that had been in operation for over 10 years were selected as follows: 1 manager for the financing company, 2 managers for housing co-operatives, 7 managers for commercial agencies and 2 managers for construction companies were selected. For commercial agencies, which comprised the majority of stakeholder organizations, 10% of the companies were selected in the sample.

The study employed a mixed sampling approach, using systematic sampling for households and purposive sampling for experienced housing sector managers. Data was collected through structured questionnaires for households and interview schedules for

managers. A pilot study was conducted to refine the instruments and processes. Trained research assistants administered the questionnaires using a "drop off and pick up later" method. Quantitative data was analyzed using SPSS, with descriptive statistics, correlation, and regression analyses to examine variable relationships and effects on housing affordability. Results were presented in tables with interpretation and discussion.

## 5. Data Analysis

The study sought to determine the level of income among households in Nakuru County. Questionnaire items on the variables were analyzed descriptively using mean and standard deviation. The following items were used to establish the level of income among the households: income levels are stable over a period of time, income levels can support mortgage repayments, income levels can cater for most of the financial needs, income levels can support the housing features that would be desired, income levels can support housing commitments, income levels being above the rest of household members, income levels improving over time and the presence of household members who were economically inactive. Table 5 shows descriptive statistics for household income.

**Table 5: Descriptive Analysis of Household Income**

Statement	NE	SE	ME	LE	VLE	Total	
	F (%)	F (%)	F (%)	F (%)	F (%)	Mean	Std. Dev
My income levels are stable over a period of time	67 (20.1%)	198 (59.5%)	43 (12.9%)	18 (5.4%)	7 (2.1%)	2.10	0.853
My income level can support mortgage repayments	65 (19.5%)	195 (58.6%)	55 (16.5%)	6 (1.8%)	12 (3.6%)	2.11	0.864
My income levels can cater for most of my financial needs	72 (21.6%)	202 (60.7%)	41 (12.3%)	15 (4.5%)	3 (0.9%)	2.02	0.776
My income level can support housing features that I would desire	41 (12.3%)	219 (65.8%)	33 (9.9%)	18 (5.4%)	22 (6.6%)	2.28	0.978
My income level can support housing commitments	50 (15.0%)	224 (67.3%)	28 (8.4%)	30 (9.0%)	1 (0.3%)	2.12	0.780
My income level is above the rest of household members	76 (22.8%)	194 (58.3%)	49 (14.7%)	6 (1.8%)	8 (2.4%)	2.03	0.815
My income levels are improving	56 (16.8%)	208 (62.5%)	49 (14.7%)	11 (3.3%)	9 (2.7%)	2.13	0.823
I have household members who are economically inactive	17 (5.1%)	8 (2.4%)	51 (15.3%)	185 (55.6%)	72 (21.6%)	3.86	0.953
<b>Composite Scores</b>						<b>2.33</b>	<b>0.855</b>

From Table 5, a majority (79.6%) of respondents did not have stable income their income over a period of time. Only 7.5% of the respondents indicated that their income levels were stable. This was further evidenced by a mean of 2.10 and a standard deviation of 0.853, which indicated that there was consensus among the respondents regarding the

stated metric. Matheson (2018) found that the availability of stable income affects the affordability of housing among Canadian residents. Goodman, Li, and Zhu (2018) also found that the residents without a steady annual income do not have the capacity to borrow funds for housing. In fact, the study specified that the residents with an annual income not exceeding 20,000 USD did not have the capacity to borrow funds for housing, while only 2% of the residents with an income range between 31,000-40,000 USD had sufficient income to borrow for the housing aspects.

From the interviews, it was also observed that the income level of the majority of low-income earners was below one dollar. According to the stakeholders, such households may not readily fit into the available housing plans. It was further observed that;

*“Constant income among individuals indicates that the individuals are able to have an appealing bank statement that can enable them to acquire many funds through loans and mortgages.”*

The respondents' level of income could support mortgage payments, as evidenced by a mean of 2.11 and a standard deviation of 0.864. The mean value lies between 1.8 and 2.6, which was a suggestion that the respondents, on average, agreed that their income could support the mortgage payments to a small extent. Further, the obtained standard deviation (less than 1.000) was an indication of consensus among the respondents in regard to the statement. This was further supported by the response of the majority (77.1%), who indicated that to a small extent, their income levels could enable them to pay for the mortgage and on the contrary, 5.4% of the respondents indicated that to a very large extent, their income level could support their mortgage payment. This is consistent with what the majority of the interviewed stakeholders indicated. From the interview, it was observed that;

*“Most of low-income earners are unable to obtain a mortgage since their income is too low to facilitate its repayments.”*

Hilber and Schhni (2016) established that the majority of low-income citizens cannot fully support mortgage repayments. Similarly, Boachie-Yiadom (2015) established that the average interest rate for the mortgage stood at 30%, making it a challenge to make the required monthly repayments for low-income earners.

Income earned by the respondents could not cater to most of their financial needs, as evidenced by a mean of 2.02. This was further evidenced by the majority response of (82.3%) that income levels could not cater for their financial needs, while only 5.4% contradicted the statement, indicating that, to a very large extent, their income supported their financial needs. Their standard deviation of 0.776 suggested that the opinions were not widely varied among the respondents. Interviewed stakeholders were in agreement with these assertions and it was observed that;

*“Most of the individuals earning low income are unable even to meet the very basic needs such as food and health and therefore they cannot afford a good housing in the expense of their very fundamental needs, for example, food”*

Bujang, Shapeen, Zarin, and Ismail (2017) established that most of the stressing issues in housing affordability are related to the ability of households to cater to their other varied financial needs. Philipp (2015) also found that declining household incomes contributed to challenges in the affordability of housing, especially with most of the income being directed to other pressing financial needs for food and clothing.

The majority (78.1%) of respondents indicated that their income levels would not fully support their desired housing features, with only 11.9% of the respondents indicating that, to a very large extent, their income could enable them to have a house with the desired features. This was further confirmed by a mean of 2.28, which is a value between 1.8 and 2.6 and a standard deviation of 0.978, which is a value less than 1.000, showing that the respondents were in consensus with regards to the extent to which their income levels supported desired housing features. The same assertions were held by most of the stakeholders in real estate and housing finance, who indicated that;

*“Most low-income earners build or acquire simple structures without all the features they may desire. Oher obtains semi-permeant houses in a land they inherited from their parents.”*

Ezennia and Hoskara (2019) found that desired housing features come secondary to having a basic structure for housing. Similarly, Anacker (2019) revealed that low-income renters had insufficient income to rent houses with desired conditions due to low incomes, lack of government subsidies and incentives, thus leading to high rent burdens and, on the extreme end, displacement and homelessness of residents.

A mean score of 2.12 was evidence that the income levels of households could not support housing commitments. This is further evidenced by a majority (82.3%) of the respondents who indicated that their income was only able to support the housing commitments to a small extent. Similarly, the respondents were in consensus on this metric as supported by a standard deviation of less than 1.00 (standard deviation =0.780). The inability to support housing commitments was still a theme that emerged from the interviews. With respect to this, the interviewed respondents observed that;

*“Building a house requires a substantial amount of money to cater for various materials and services that people with low income are unable to afford”*

O'Connor (2016) found that the ability to support house commitments is an indicator of housing affordability, which was shallow in the current study. Similarly, Zainon *et al.* (2017) found that low-income earners would be challenged in accessing the housing loan due to the high house pricing aspects.

Most (79.3%) of the respondents pointed out that their income levels were not significantly above those of the rest of the family members. On the contrary, only 6% of the respondents indicated that their income levels were, to a very large extent, above those of the rest of the family members. A mean of 2.03 further affirmed that respondents had lower incomes than other household members. A standard deviation of 0.815 showed consensus among the respondents on having a lower income in comparison to other household members. Contrary to this, the interviewed stakeholders found that despite the amount of income one earns compared to the rest of the household members, determined individuals can always save for a desired housing in future. One of them indicated that;

*“I do not think that income levels of a household member in respect to the rest of the members are anything to go by in the matters of building. It only takes determination and vision for an individual to save for the purpose of acquiring a house.”*

Baranoff (2016) indicated that the presence of high household income among members of one family increases the probability of owning a house. Goodman *et al.* (2018) indicated that there was a moderate correlation between the number of persons working in a family and the level of housing affordability. The study revealed that housing affordability becomes easy with the increase in the number of working members in a household. This is further in line with the findings by Chung *et al.* (2019) who found that collective household income determined the level of affordability for housing needs of the particular household.

The study established that a majority (77.2%) of the respondents' income levels had only improved to a small extent. This position was supported by a mean of 2.13, which was between 1.8 and 2.6, suggesting that most respondents, on average, agreed to a small extent on the improvement of their income levels. The standard deviation of 0.823, which is a value below 1.000, further evidenced a small spread of responses in rating this metric. One stakeholder asserted that;

*“Improving income is an indicator of future prospects of owning a house due to improvement of loan credibility with time.”*

These findings are consistent with those of Ezennia and Hoskara (2019b) found that most low-income earners in Nigeria have constant low income for a very long time, incapacitating them into owning property and requiring income levels. Friedman and Koc (2017) documented that lower-income households consistently, for long periods, had significantly lower household ownership aspects.

The study further established that a majority (55.6%) of low-income households had household members who were economically inactive. This was contrary to 5.1% of the respondents who proposed that they had household members who were economically active. A mean of 3.86 further affirmed the response. A standard deviation

of 0.953 symbolized lower levels of divergent views; hence, there was a consensus among the respondents about economically inactive household members. Most stakeholders did not fully support the idea of cumulative household income by indicating that most of the time housing is a one-person initiative and not a group, and loans are based on that.

Kallergis *et al.* (2018) found that there were many household members who were not working among the families from lower economic backgrounds, hence concurring with the findings in the current study. The amount of household income is relative to the number of households who are actively working and hence associated with housing affordability (Marissa, 2019). The number of household members that are economically active was also a significant consideration for the affordability of the housing aspect (Birčiaková *et al.*, 2017).

Focusing on the composite scores, the study obtained a composite mean score of 2.33 and a composite standard deviation of 0.855. The composite mean score indicates that the income level among the households was low and could support housing needs and commitments to only a small extent. This was further evident by the majority of the respondents, who indicated a small extent to the statements measuring the income levels. The composite standard deviation achieved in this objective indicates that the households were in consensus in rating the various statements measuring the levels of households' income. This indicates that all the respondents had almost equal levels of income, which was low and could only support housing needs and commitments to a small extent.

Philipp (2015) found that declining household incomes contributed to challenges in the affordability of housing, especially with increasing house prices. Birčiaková, Antošová, and Balák (2017) found that income levels influenced the place of residence of the household. Ismail *et al.* (2015) found that in Malaysia, the income of the household determines the type of housing and the house prices that households can afford. These findings are in agreement with various studies that indicated that housing challenges of low-income earners are incapacity to afford housing-related materials, infrastructure and services such as land, building materials, decent houses to rent, mortgage facilities and labour costs for building, among others, due to their low income (Marissa, 2019; Ezennia & Hoskara, 2019b, 2019a; Kallergis *et al.*, 2018; Bujang *et al.*, 2017 O'Connor, 2016; Baranoff, 2016).

## 6. Correlation Analysis

The study used correlational analysis to establish the relationship between the financial factors of low-income households and housing affordability. Correlation analysis aimed to show the nature, strength and significance of the relationship between household incomes and housing affordability among low-income households in Nakuru East and Nakuru West Sub-Counties. Bryman (2015) asserts that a correlation coefficient of -1 and 1 implies that there is a perfect negative and positive relationship, respectively. A positive relationship is a result of a direct relationship between the variables, while a negative relationship implies that the two variables are inversely related. A correlation coefficient

of zero indicates a lack of relationship. Correlation coefficient |0.100-0.399| implies a weak relationship, |0.400-0.699| a moderate relationship and a correlation coefficient of |0.700-0.999| implies a strong relationship (Bryman, 2015). A p-value of less than 0.05 implies a significant relationship, and p-values of 0.05 and above imply an insignificant relationship (McDonald, 2015). These results are shown in Table 6.

**Table 6: Correlation Analysis**

Variables Statistics	Affordability of Housing	
Income of Households	R	0.440**
	p-value	0.000
	N	333

From Table 6, correlation analyses findings revealed a moderate positive relationship between the income of the household and the affordability of housing. This is evidenced by ( $r = 0.440$ ). Similarly,  $p=0.00$ ,  $<0.05$  implies that the relationship is statistically significant. These findings indicate that enhanced income among households would lead to some reprieve in terms of initiatives towards house ownership.

These findings are in line with those of Goodman *et al.* (2018) that established a positive and significant relationship between income levels and house affordability among low-income households. Similarly, Ochieng *et al.* (2017) found that household income has a positive correlation with access to affordable housing. Philipp (2015) found that declining household incomes contributed to challenges in the affordability of housing, especially with increasing house prices. Similarly, a study for the American Housing Survey and Household Budget Survey in Turkey by Friedman and Koc (2017) documented that lower-income households had significantly lower household ownership aspects. In addition, a study by Birčiaková *et al.* (2017) established that income levels influence the place of residence of the household. The number of household members that are economically active was also a significant consideration for the affordability of the housing aspect.

Further supporting the findings of this study, Ismail *et al.* (2015) found that the income of a household determines the type and prices of houses affordable to households. The majority of the households do not have sufficient income levels to be financed by financial institutions. Similarly, Baranoff (2016) found that income levels affect the level of affordability of housing; he established that a 10% increase in the income level of households increased house prices by 6% and thus reduced affordability.

## 7. Conclusions and Recommendations

### 7.1 Conclusions

The study concluded that household income has a moderate positive and significant effect on housing affordability among low-income households in Nakuru East and West Sub-Counties, Kenya. Lower household incomes contributed to challenges in affording housing, especially with increasing house prices. The income level determines the type

and price of housing that households can afford, with many low-income households lacking sufficient income to obtain financing from financial institutions.

## 7.2 Recommendations

- 1) Implement policies and programs to boost income levels among low-income households, such as job training, minimum wage increases, or income support. Higher incomes would improve housing affordability.
- 2) Provide targeted housing subsidies, incentives or financing options for low-income households to bridge the affordability gap caused by their income constraints. This could include down payment assistance, reduced interest rates, or rental assistance.
- 3) Encourage affordable housing stock development for low- and moderate-income households, potentially through incentives for developers, zoning and permitting changes, or public-private partnerships focused on affordable housing creation.
- 4) Couple housing assistance with financial literacy education to help low-income households manage their limited incomes effectively and make informed housing decisions within their budgets.

## Conflict of Interest Statement

The authors declare no conflicts of interest.

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