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## Residual Income Based Housing Affordability and Green Community Interventions among Low Income Households in Greater Kuala Lumpur

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### Abstract

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This study examines housing affordability among low income (B40) households in Greater Kuala Lumpur using a residual income framework that reflects essential household needs and cost-of-living realities. The research pursues two objectives: (1) to assess residual income based affordability levels among B40 households, and (2) to evaluate how community gardens in low-cost housing areas function as a green intervention that enhances food security and reduces expenditure pressures. By integrating primary household survey data with secondary socio-economic and environmental indicators, the analysis investigates spending patterns across food, transport, healthcare, education, and energy, while assessing the contribution of community gardening to household resilience. Findings reveal significant residual income deficits, yet households engaged in community gardening report modest savings on food purchases and improved access to fresh produce. The study contributes to sustainable housing research by presenting a multidimensional affordability framework aligned with SDG 1, 10, 11, and 13.

**Keywords:** Affordable House; Residual Income; Cost of Living; Community Garden; Kuala Lumpur.

### 1. Introduction

Affordable housing in urban Malaysia has become increasingly fragile, particularly in Greater Kuala Lumpur, where the cost of shelter is inseparable from the wider cost of city living. For low-income households, the real burden of housing is not confined to rent or mortgage payments alone, but is intensified by transport, food, utilities, education, healthcare, and other recurrent expenditures required to sustain daily life in a metropolitan region. This pressure persists despite longstanding policy attention to affordable housing. Malaysian evidence continues to show that housing affordability for low-income groups is undermined by low household income, weak financing capacity, high land and construction costs, and a persistent mismatch between the supply of “affordable” units and the effective demand of households who remain unable to purchase or sustain them. The wider cost-of-living context reinforces this concern, official statistics show that mean monthly household consumption expenditure in Malaysia rose from RM5,150 in 2022 to RM5,566 in 2024, while housing and utilities, food, and transport remained among the largest expenditure components. In this context, the central problem is not merely whether housing is priced below a formal threshold, but whether it leaves households with enough money to live adequately after housing costs are paid (DOSM, 2023).

The major conceptual weakness in much of the affordability literature is therefore the continued reliance on ratio-based measures, particularly price-to-income and expenditure-to-income thresholds, which indicate the share of income devoted to housing but do not reveal whether sufficient income remains to meet basic non-housing needs. Recent housing research has shown that this is not a minor technical issue but a substantial analytical blind spot. Airgood-Obrycki, Hermann, and Wedeen (2023) demonstrate that standard cost-burden measures systematically understate hardship when compared with residual-income measures, because many households who appear “affordable” under a percentage rule still fall short of a modest standard of living once food, health, transport, and other essentials are accounted for. Likewise, recent residual-income work shows that affordability stress has deepened precisely because inflation in non-housing essentials has squeezed what remains after rent is paid. This critique is highly relevant to the present study. As Sohaimi, Hanafiah, Manaf, and Zivalı (2024) argue in contemporary affordable housing research has moved decisively beyond narrow cost metrics and increasingly integrates health, policy, technology, and community well-being, underscoring the need for more multidimensional affordability frameworks.

This measurement problem is especially acute for B40 households in Greater Kuala Lumpur because urban affordability is structured through spatial trade-offs. Households priced out of well-located areas often compensate by

moving to peripheral or under-serviced neighbourhoods, but lower housing payments can be offset by longer commutes, higher transport spending, and weaker access to jobs and services. Recent longitudinal evidence in Khammo, Kim and Wang (2024) show that rising housing costs lead to longer commute duration and a redistribution of expenditure towards transport, illustrating that households absorb housing pressure through mobility-related adjustments rather than through housing expenditure alone. Related work on the “real cost of housing” similarly argues that lower-income households in outer-urban, under-serviced locations bear disproportionate commuting burdens and face cumulative pressures that conventional affordability measures rarely capture. This broader framing is consistent with Sohaimi and Shuid’s argument that housing decisions in Malaysian urban areas are shaped by intertwined economic, social, and environmental considerations rather than by price alone (2023). For Greater Kuala Lumpur, this means that housing affordability should be analysed as a metropolitan welfare issue, not as a single-market indicator.

Against this background, the residual income model offers a more appropriate framework for assessing affordability among low-income households because it evaluates whether households can meet minimum non-housing needs after paying for housing. This makes the model especially suitable for B40 households whose budgets are already compressed by transport, food, and utility costs, and whose vulnerability is further shaped by household composition, caregiving obligations, and locational disadvantage. The importance of such a lens is reinforced by recent studies linking housing unaffordability to wider well-being outcomes. Arundel, Li, Baker, and Bentley (2024) show that unaffordable housing is associated with poorer mental health, particularly among renters and younger adults. Botha, Bentley, Li, and Wiesel (2024) similarly find that housing affordability stress operates through financial well-being, highlighting how budgetary strain translates into broader psychosocial harm. At a more systemic level, Bentley et al., (2025) argue that affordable, suitable, and secure housing should be treated as a core social determinant of health. Taken together, these findings suggest that for low-income urban households in Greater Kuala Lumpur, insufficient post-housing income is not simply a budgeting inconvenience. It is a mechanism through which housing systems shape inequality, health, and long-term resilience.

Alongside a more realistic affordability metric, green community interventions deserve serious attention as complementary strategies for reducing urban vulnerability. Community gardens are particularly relevant because they operate at the intersection of food access, household expenditure, neighbourhood cohesion, and environmental quality. Recent evidence shows that community gardens can be highly productive and can provide fresh produce that substantially offsets high food costs, even if the distribution of benefits is not always equal. Research on community greening programmes in social housing further shows significant improvements in well-being, community connectedness, civic pride, and resilience among vulnerable residents.

At the same time, the emerging literature cautions against romanticising gardens as automatically inclusive. Abrantes et al. (2025) show that long-term outcomes depend on governance structures that combine institutional support with meaningful community co-decision-making, while Chen et al. (2025) show that community gardens do not necessarily align with food-desert areas unless investment is deliberately targeted towards underserved neighbourhoods. Urban home gardens can enhance mental well-being, reinforcing the wider proposition that small-scale urban greening can generate tangible social benefits in dense metropolitan environments. For low-cost housing areas, community gardens should therefore be understood not as decorative landscape features, but as neighbourhood infrastructures that can support food security, modest expenditure relief, social resilience, and environmental sustainability when designed and governed equitably.

This study is situated precisely at the intersection of these two debates. It argues that housing affordability among B40 households in Greater Kuala Lumpur cannot be adequately explained through conventional ratio measures alone and that neighbourhood-based green interventions may help relieve part of the expenditure pressure that makes housing unaffordable in lived terms. By assessing residual income-based affordability levels among B40 households and evaluating how community gardens in low-cost housing areas function as a green intervention that enhances food security and reduces expenditure pressures, the study advances a multidimensional understanding of affordability grounded in post-housing financial capacity, urban sustainability, and community resilience. This framing also aligns with recent work which emphasises that affordable housing research is increasingly concerned with social equity, environmental well-being, and socioeconomic sustainability rather than cost alone. For Greater Kuala Lumpur, the contribution is therefore both empirical and conceptual. The study reconnects housing affordability to everyday survival after housing payments, while also showing that green community infrastructures may play a practical role in strengthening the resilience of low-income urban households.

## 2. Materials and Methods

This study adopted a cross-sectional mixed-method research design to investigate housing affordability among low-income households in Greater Kuala Lumpur using an expenditure-sensitive affordability framework that extends beyond the conventional price-to-income ratio approach. The study was conducted in two phases. First, a quantitative approach was employed to examine housing affordability conditions among low-income households by applying the Residual Income Model, which evaluates affordability based on the adequacy of income remaining after accounting for housing and non-housing expenditures. Second, a qualitative approach using semi-structured interviews was undertaken to evaluate how community gardens in low-cost housing areas function as a green community intervention that contributes to food security, supports household well-being, and alleviates expenditure pressures among urban low-income residents.

## 2.1 Quantitative approach

Primary data were obtained through a structured questionnaire survey involving 344 respondents. The study employed the Residual Income Model (RIM) to evaluate housing affordability by assessing the adequacy of household income remaining after deducting both housing and non-housing expenditures. The residual income equation is expressed as:

$$RI = MI - (HC + NHE)$$

**Equation 1.** Residual income equation.

*Note:*

*RI* : Residual Income

*MI*: Monthly Income

*HC*: Housing Cost

*NHE*: Non-Housing Expenditure

where RI represents residual income, MI denotes monthly income, HC refers to housing costs, and NHE represents non-housing expenditures. Housing affordability was operationalised as a binary outcome variable, whereby households with residual income equal to or above the minimum living standard threshold were classified as affordable ( $Y_i = 1$ ), while those below the threshold were categorised as not affordable ( $Y_i = 0$ ).

Given the dichotomous nature of the dependent variable, Binary Logistic Regression (BLR) analysis was employed to estimate the probability of attaining housing affordability. The general logistic regression model is specified as:

$$\ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki}$$

**Equation 2.** General logistic regression model.

where  $P_i$  represents the probability that respondent  $i$  achieves housing affordability,  $\beta_0$  denotes the intercept,  $\beta_k$  represents the regression coefficients, and  $X_k$  refers to the explanatory variables included in the model. The probability function is expressed as:

$$P_i = \frac{e^{(\beta_0 + \sum \beta_k X_{ki})}}{1 + e^{(\beta_0 + \sum \beta_k X_{ki})}}$$

**Equation 3.** Variables in the model.

This specification constrains the predicted probabilities between 0 and 1 and ensures econometric consistency in modelling housing affordability outcomes. The empirical model incorporated several socio-economic and expenditure-related variables influencing low income household housing affordability, including education level, number of dependent children, number of working household members, monthly household income, household expenditure, transportation expenditure, education loan repayment commitments, and monthly housing repayment obligations. The estimated model is formulated as follows:

$$\begin{aligned} \text{logit}(P_i) = & \beta_0 + \beta_1(\text{Education}_i) + \beta_2(\text{Children}_i) + \beta_3(\text{WorkingHH}_i) + \beta_4(\text{HouseholdIncome}_i) \\ & + \beta_5(\text{HouseholdExpenditure}_i) + \beta_6(\text{Transportation}_i) + \beta_7(\text{EducationCost}_i) \\ & + \beta_8(\text{HousingCost}_i) + \varepsilon_i \end{aligned}$$

**Equation 4.** socio-economic and expenditure-related variables.

Education level was categorised into bachelor's degree, master's degree, and Doctor of Philosophy qualifications. Household expenditure variables were measured using the Department of Statistics Malaysia (DOSM) cost-of-living indicators. A positive regression coefficient indicates that an increase in the corresponding explanatory variable raises the likelihood of achieving housing affordability, holding other variables constant. Furthermore, the exponentiated coefficient,  $\exp(\beta_k)$ , represents the odds ratio, where values greater than one indicate a higher probability of affordability, whereas values below one indicate a lower probability. To ensure the robustness and reliability of the estimated model, several diagnostic and goodness-of-fit measures were employed, including the Hosmer–Lemeshow test, classification accuracy, and pseudo- $R^2$  statistics. These procedures were conducted to evaluate model adequacy and the predictive performance of the logistic regression analysis.

## 2.2 Qualitative approach

Following the quantitative assessment of housing affordability using the Residual Income Model, a qualitative phase was conducted through semi-structured interviews to further explore the role of green community interventions among low-income households in Greater Kuala Lumpur. A total of 14 respondents were purposively selected from low-cost and affordable housing areas that actively implemented community-based green activities such as urban farming, community gardens, and small-scale environmental programmes. The semi-structured interview approach was chosen to

allow respondents to share their experiences, perceptions, and challenges related to participation in green community initiatives within urban residential environments. The interviews focused on several themes, including food security, reduction of household expenditure, social interaction, environmental awareness, wellbeing, and the perceived contribution of community gardens towards sustainable urban living. Respondents were selected based on their involvement and experience in community green activities. The interview sessions were conducted face-to-face and online, depending on respondents' availability, with each session lasting approximately 30 to 45 minutes. The collected qualitative data were analysed using thematic analysis to identify recurring patterns, experiences, and perceptions related to green community interventions and urban housing sustainability.

### 3. Results

#### 3.1 Quantitative analysis: Assessment of Residual Income Based Housing Affordability among B40 Households.

The findings demonstrate that housing affordability among B40 households in Greater Kuala Lumpur cannot be understood solely through conventional price-to-income ratio measures, as many households continue to experience residual income deficits after fulfilling basic living commitments. The Residual Income Model applied in this study reveals that although some households may appear statistically "affordable" under traditional affordability indicators, they still face significant financial stress after accounting for transportation, food, utilities, healthcare, education, and other daily expenditures. This supports the argument that housing affordability should be evaluated based on the adequacy of remaining income after housing and essential non-housing expenditures rather than relying exclusively on housing price ratios.

The Binary Logistic Regression findings further reinforce this argument by identifying several significant determinants influencing housing affordability among low-income households. Household income recorded statistically significant relationship with affordability (Sig. = .000; Exp(B)=1.002), indicating that increases in household income slightly improve the probability of achieving affordable living conditions. This finding is consistent with housing affordability literature which suggests that income stability remains the strongest predictor of sustainable housing consumption among vulnerable urban households.

Household expenditure demonstrated significant relationship with affordability (Sig. = .000; Exp(B)=.997), implying that higher monthly expenditures substantially reduce the ability of households to maintain adequate residual income. This reflects the increasing cost-of-living pressure currently experienced in urban Malaysia, particularly in Greater Kuala Lumpur where inflation, food prices, utility costs, and urban service expenses continue to rise. The result suggests that affordability problems are not solely caused by housing prices, but also by the broader urban expenditure structure faced by low-income communities.

Transportation cost also emerged as a highly significant factor affecting affordability (Sig. = .000; Exp(B)=.998). This finding is particularly important within the Greater Kuala Lumpur context, where urban sprawl, long commuting distances, traffic congestion, and limited access to efficient public transportation increase household mobility expenditure. The result indicates that transportation costs directly erode residual income and reduce disposable income available for food security, savings, healthcare, and educational needs. This supports the growing argument that housing affordability should be integrated with transportation affordability, particularly in metropolitan regions where employment opportunities are spatially concentrated. The finding also demonstrates that households living farther from employment centres may face hidden affordability burdens despite paying lower housing costs.

Monthly housing cost was also found to significantly influence affordability (Sig. = .023; Exp(B)=.999). Although the coefficient appears relatively small, the result confirms that housing expenditure remains a core component affecting residual income adequacy. This indicates that even moderate increases in rent, mortgage payments, maintenance fees, or utility-related housing expenses can intensify financial vulnerability among B40 households.

The number of children was another statistically significant variable (Sig. = .045; Exp(B)=2.222), suggesting that larger household dependency burdens increase affordability pressure. Households with more children generally experience higher expenditures related to food, education, transportation, and healthcare, which subsequently reduce remaining disposable income. This finding highlights the importance of considering household composition when evaluating housing affordability, as affordability pressures differ substantially across family structures. Interestingly, education cost and number of working household members were not statistically significant in this model. This may indicate that additional working household members do not necessarily guarantee affordability improvements due to the relatively low wage structure among B40 households. Similarly, educational expenditure may vary considerably depending on household priorities, subsidies, and public education access.

**Table 1:** Variables in the Equation.

| Description                   | Variables             | S.E.   | Wald   | Sig. | Exp(B)        |
|-------------------------------|-----------------------|--------|--------|------|---------------|
| Education Level               | Bachelor Degree       |        | .955   | .620 |               |
|                               | Master's Degree       | .529   | .955   | .328 | 1.677         |
|                               | Doctor of             | 27958. | .000   | .999 | 31672         |
|                               | Philosophy            | 498    |        |      | 29653.<br>565 |
| Number of Children            | Children              | .399   | 4.013  | .045 | 2.222         |
| Number of working household   | Working Household     | .687   | .161   | .688 | 1.318         |
| Monthly household income      | Household Income      | .000   | 35.755 | .000 | 1.002         |
| Monthly household expenditure | Household Expenditure | .001   | 18.056 | .000 | .997          |
| Monthly transportation cost   | Transportation cost   | .000   | 21.248 | .000 | .998          |
| Monthly education cost        | Education cost        | .002   | 1.007  | .316 | .998          |
| Monthly housing cost          | Housing cost          | .000   | 5.142  | .023 | .999          |

### 3.2 Qualitative analysis: Evaluation of Community Gardens as a Green Intervention for Enhancing Food Security and Reducing Expenditure Pressures in Low-Cost Housing Areas.

This study demonstrate that community gardens in low-cost housing areas function as an effective green intervention that enhances food security and reduces expenditure pressures among B40 households in Greater Kuala Lumpur. The qualitative findings reveal that participation in community gardening activities provides households with direct access to basic food supplies, particularly vegetables and herbs, while simultaneously reducing dependence on market purchases. This intervention becomes increasingly important within the context of rising urban living costs, food inflation, and residual income constraints experienced by low-income households.

Respondents consistently reported that community gardens contribute positively to household food security through improved accessibility to fresh and affordable food sources within their residential environment. Households involved in gardening activities were able to harvest vegetables such as chilli, spinach, kangkung, and other edible crops for daily consumption. Although the gardens may not fully replace household food purchases, the findings indicate that they provide supplementary food resources that reduce vulnerability to food shortages and rising food prices. One respondent explained:

*“Sometimes we can harvest vegetables directly from the garden. It helps us a lot because food prices are getting higher, especially for fresh vegetables. Before this, we needed to buy vegetables almost every day at the market, but now some of our daily needs can be taken from the garden itself. Although the amount is not always large, it still helps reduce our weekly food expenses. The garden also gives us easier access to fresh and healthier food for our family, especially during times when the cost of living continues to increase. At the same time, the activity encourages residents to work together and creates a stronger sense of community within the housing area.” - Respondent 1*

This finding suggests that community gardens improve urban food accessibility by creating localised food production systems within low-cost housing environments. The intervention enables residents to access fresh produce without relying entirely on external food markets, thereby strengthening household food resilience during periods of economic uncertainty.

In addition, the study found that community gardens help reduce household expenditure pressures, particularly food-related expenses, which indirectly improve residual income conditions among B40 households. Several respondents highlighted that small but consistent reductions in food expenditure allow households to allocate remaining income towards other essential needs such as transportation, education, utilities, and children's expenses. One participant stated:

*“At least we spend less buying vegetables every week. The savings may be small, but for low-income families, it still helps reduce our burden. Sometimes the money we save can be used for other important needs such as transportation, school expenses for children, or utility payments. Fresh vegetables are becoming more expensive now, so having access to the community garden gives us some relief. It may not solve all financial problems, but it helps us manage our daily living costs and makes us feel more secure during difficult times.” - Respondent 4*

This finding is particularly significant within the Residual Income Model framework, which emphasises the importance of income remaining after housing and non-housing expenditures are deducted. By lowering food expenditure, community gardens indirectly contribute to affordability sustainability and reduce financial stress among vulnerable urban households.

Beyond economic benefits, the findings also indicate that community gardens strengthen community resilience and social sustainability. Residents described gardening activities as a collective effort that encourages cooperation, mutual support, and knowledge sharing among neighbours. Community participation in gardening activities creates stronger social interaction and informal support networks within low-cost housing areas. One respondent mentioned:

*“The garden is not only about planting. It brings residents together, and we help each other maintain the area and share the harvest. Through these activities, we become closer as neighbours, communicate more often, and support one another during difficult times”. - Respondent 7*

Furthermore, respondents perceived community gardens as contributing positively to environmental sustainability and urban liveability. Previously underutilised spaces were transformed into productive green areas that improve environmental quality, reduce urban heat conditions, and create a cleaner residential environment. The presence of greenery also contributes to emotional wellbeing and promotes healthier urban living conditions.

The findings demonstrate that community gardens operate as a multidimensional green intervention that simultaneously enhances food security, reduces expenditure pressures, strengthens social resilience, and supports environmental sustainability within low-cost urban housing areas. The study therefore argues that sustainable affordable housing policies should incorporate community-based green interventions as part of broader urban housing and poverty reduction strategies, particularly in rapidly urbanising cities where low-income households continue to experience increasing financial and food security challenges.

## 4. Discussion

### 4.1 Reframing Housing Affordability Beyond Conventional Indicators

The findings of this study indicate that housing affordability among B40 households in Greater Kuala Lumpur should be understood as a multidimensional urban welfare issue rather than a purely housing-market problem. While conventional affordability measures primarily focus on the relationship between housing price and household income, the present study demonstrates that affordability pressures are strongly influenced by broader non-housing expenditures, particularly transportation, food, utilities, healthcare, and family dependency commitments.

The application of the Residual Income Model provides important empirical evidence that households may remain financially vulnerable even when their housing expenditure appears statistically affordable. This finding challenges the continued reliance on the Price-to-Income Ratio approach commonly applied in housing studies and policy evaluations in Malaysia. Instead, the study supports recent international scholarship advocating expenditure-sensitive affordability frameworks that consider the adequacy of remaining income after essential living costs are deducted.

Transportation expenditure emerged as one of the strongest determinants affecting affordability conditions among low-income households. This reflects the spatial realities of Greater Kuala Lumpur, where many affordable housing locations remain distant from employment centres and public facilities. Consequently, lower housing costs in peripheral areas may be offset by higher commuting expenses, indirectly weakening household financial resilience. The findings therefore suggest that affordable housing policies should not focus solely on housing provision, but also on accessibility, public transportation integration, and spatial planning efficiency.

Similarly, the significance of household expenditure and dependency burden highlights the complexity of urban poverty among B40 households. Larger family size increases expenditure obligations related to food, education, healthcare, and transportation, reducing the ability of households to maintain adequate residual income. This finding suggests that housing affordability policies should adopt a household-sensitive approach by considering demographic composition, dependency ratio, and broader living cost realities rather than applying uniform affordability thresholds across different household structures.

### 4.2 Green Community Interventions and Urban Household Resilience

The qualitative findings further demonstrate that community gardens function as an important community-based green intervention capable of supporting urban household resilience among low-income communities. Unlike many affordability studies that focus exclusively on financial variables, this study highlights how localised green initiatives can indirectly contribute to affordability sustainability through expenditure reduction, food accessibility, and community support systems.

Community gardens were found to improve access to fresh food sources within residential areas, particularly vegetables and basic edible crops commonly used for daily consumption. Although the scale of production remains relatively small, the intervention reduces partial dependence on external food markets and provides supplementary food support during periods of rising living costs. This finding is especially relevant within the context of increasing food inflation and economic uncertainty affecting urban low-income households.

Importantly, the study reveals that the contribution of community gardens extends beyond economic savings alone. The findings indicate that gardening activities strengthen social interaction, cooperation, and informal support networks among residents. Such outcomes are significant because social cohesion and community participation are increasingly recognised as critical dimensions of urban resilience and sustainable neighbourhood development. In low-

cost housing environments where financial vulnerability remains high, collective community activities may strengthen both emotional wellbeing and neighbourhood solidarity.

The findings also demonstrate the environmental contribution of community gardens within densely populated urban housing areas. Previously unused or neglected spaces were transformed into productive green environments that improved neighbourhood aesthetics, environmental quality, and liveability. This supports contemporary sustainable urban development discourse which emphasises the integration of green infrastructure and community participation within affordable housing environments.

### 4.3 Theoretical and Policy Contributions

This study contributes to sustainable housing scholarship by integrating residual-income-based affordability analysis with community-based green intervention perspectives. The integration of economic, social, and environmental dimensions provides a more holistic understanding of affordability challenges experienced by low-income urban households. The study therefore extends existing affordability literature by positioning affordability not merely as a housing cost issue, but as part of a broader urban resilience and sustainability framework.

From a policy perspective, the findings suggest that affordable housing strategies should move beyond the traditional emphasis on housing unit delivery alone. Greater policy attention should be given towards reducing non-housing expenditure burdens through integrated transportation planning, accessible public facilities, urban food security programmes, and neighbourhood-based green initiatives. Community gardens, in particular, should be recognised as a practical urban sustainability mechanism capable of supporting food resilience, reducing minor expenditure pressures, and enhancing social wellbeing among vulnerable households.

Nevertheless, this study acknowledges several limitations. The qualitative component involved a relatively small number of respondents and focused specifically on selected low-cost housing areas within Greater Kuala Lumpur. Future studies may employ longitudinal approaches, larger samples, and comparative regional analysis to further examine the long-term relationship between residual income sustainability, green community interventions, and urban household resilience.

## 5. Conclusions

The study demonstrates that housing affordability among B40 households in Greater Kuala Lumpur must be evaluated beyond conventional price-to-income ratio approaches by incorporating broader cost-of-living pressures through the Residual Income Model. The findings confirm that transportation expenditure, overall household spending, housing costs, and dependency burdens significantly shape affordability conditions among low-income urban households, highlighting that affordability is closely connected to wider urban welfare realities rather than housing prices alone. These results indicate that many households who appear “affordable” under conventional indicators continue to experience financial vulnerability after fulfilling essential non-housing needs.

The study further reveals that community gardens operate as an important community-based green intervention capable of supporting food security, reducing minor household expenditure pressures, and strengthening neighbourhood resilience within low-cost housing areas. Beyond modest economic savings, the gardens also contribute to social interaction, environmental awareness, community cohesion, and improved urban liveability. This demonstrates that green community initiatives can function as practical support mechanisms for vulnerable households facing increasing urban living costs.

Conceptually, the study contributes to sustainable housing scholarship by integrating economic, social, and environmental dimensions within a multidimensional affordability framework aligned with SDG 1, SDG 10, SDG 11, and SDG 13. The findings suggest that future affordable housing policies should move beyond housing delivery alone by incorporating transportation accessibility, community-based green infrastructure, and broader urban sustainability strategies to strengthen long-term household resilience among low-income urban communities.

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## Conflicts of Interest

The authors declare no conflicts of interest.

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