



HOMEOWNERSHIP CHALLENGES FOR MIDDLE-INCOMES GROUP IN SMART CITY BATU KAWAN, PULAU PINANG

**Norazmawati Binti Md. Sani @ Abd. Rahim¹,
Nurin Anis Syazwani Mohamad Yazan²**

*^{1,2}School of Housing, Building and Planning,
UNIVERSITI SAINS MALAYSIA*

Abstract

Batu Kawan has been designated as a Smart City by the Penang State Government, placing it alongside other major Malaysian smart city developments such as Cyberjaya and Iskandar Puteri, which have similarly experienced rapid urban growth and population inflows. As observed in these smart cities, accelerated development in Batu Kawan has been accompanied by a sharp rise in housing prices for both existing and new units, indirectly creating homeownership challenges for the middle-income (M40) group. This study was conducted using a quantitative approach to identify the level of affordability for smart city in Batu Kawan, Pulau Pinang and to examine the homeownership challenges for smart city in Batu Kawan, Pulau Pinang. A total of 100 Malaysian respondents who live and work in the area participated in the survey through structured questionnaires. The data collected were analysed using descriptive statistics, cross-tabulation and mean score analysis. The findings revealed that the level of housing affordability using HAR stood at 28.7%, within the 30% affordability benchmark, yet a notable share of respondents still faced unaffordability. The findings reveal that the main challenge is the mismatch between house prices and income (mean = 4.37, σ = 0.71), reflecting an affordability gap among the M40 group.

Keywords: Homeownership Challenges, Middle-income Group, Smart City

¹ Corresponding author. Email: norazmawati@usm.my

INTRODUCTION

The Batu Kawan Smart City development in Pulau Pinang represents a transformative shift in Malaysia's urban landscape, characterized by advanced infrastructure, digital connectivity and premium real estate. However, the benefits of such development are not equally accessible, particularly for middle-income households (M40), who often face a tension between affordability and exclusion. According to the Department of Statistics Malaysia (2022), the median monthly household income in Pulau Pinang is RM5,409 (RM64,908 annually), which would suggest an affordable housing threshold of approximately RM195,000 based on the conventional affordability rule that housing should cost no more than three times annual income. In contrast, property prices in Batu Kawan range from RM382,500 to RM601,782, exceeding the affordability threshold by two to three times (NAPIC, 2021).

From the perspective of urban economics and housing affordability theory, housing stress occurs when prices rise faster than household income, a phenomenon particularly pronounced in market-driven urban developments (UN-Habitat, 2020; World Bank, 2021). In the context of smart cities, this stress is further compounded by the premium assigned to technological infrastructure, sustainability initiatives and lifestyle amenities, which often inflate property values to the benefit of investors rather than resident households (Sarkar & Kumar, 2022). Smart city initiatives, by accelerating land value appreciation and speculative demand, generate what has been termed the "smart city premium" in housing markets (Zulkifli et al., 2022).

A studies by Zulkifli et al. (2022), highlight that while smart cities are designed to enhance quality of life, they often drive up housing costs due to increased investor demand and land value appreciation, which disproportionately affects the M40 group. As a result, the affordability gap has significantly widened, with Pulau Pinang's median house price-to-income ratio reaching 8.1, far exceeding the international affordability benchmark of 3.0 (MacDonald, 2023).

The objective of this paper is to identify the level of affordability for smart city in Batu Kawan, Pulau Pinang and to examine the homeownership challenges for smart city in Batu Kawan, Pulau Pinang. The outcome of this paper will identify the level of housing affordability for middle-income groups and their homeownership challenges.

This study contributes to the existing literature by empirically examining homeownership affordability and perceived housing challenges within a designated smart city context, namely Batu Kawan, Pulau Pinang. Unlike earlier studies that focus on conventional urban areas, this research situates affordability within the smart city development framework, highlighting how smart-driven urban transformation may unintentionally exacerbate affordability pressures for

middle-income households. The findings offer new insights into the affordability paradox faced by the M40 group in smart cities, thereby extending current debates on inclusive smart urban development in Malaysia.

LITERATURE REVIEW

Definition of Homeownership

Homeownership refers to the legal possession of a residential property by an individual or household, granting them the right to occupy, sell or lease the property. It is widely regarded as a key indicator of economic stability, personal financial achievement and long-term wealth accumulation (Kadir & Ismail, 2023). In the Malaysian context, the National Housing Policy (Dasar Perumahan Negara) 2018–2025 continues to emphasize that every family should have access to a comfortable, quality, affordable and sustainable home (KPKT, 2018; updated in Housing and Local Government Ministry Report, 2022). This policy highlights the critical role of homeownership in achieving social equity and national development goals. It reflects the belief that owning a home is not only a basic need but also a symbol of upward social mobility, especially for middle-income groups.

Level of Housing Affordability

Housing affordability is a critical issue worldwide, particularly for middle-income groups facing rising house prices coupled with stagnant or slow-growing incomes. This phenomenon is driven by strong economic growth but also creates a gap between housing prices and actual household incomes, making homeownership less attainable for first-time buyers. Affordability issues are compounded by factors such as rising interest rates, the high cost of deposits and loan repayments. The level of affordability essentially measures the ability of households to purchase or rent homes without financial hardship.

Several studies define housing affordability as the ratio of housing costs (mortgage payments, rent, utilities) to household income.

According to the United Nations (UN-Habitat, 2020), a common benchmark is that housing is considered affordable if total housing costs do not exceed 30-35% of gross household income. Exceeding this threshold often leads to housing stress, forcing families to compromise on other essential needs. Musaddad et al. (2023) examined the affordability of homeownership in the Northern Region of Malaysia, including Pulau Pinang. The study found that the median multiple of house prices in Pulau Pinang reached 5.5 in 2016, exceeding the affordability threshold set by Bank Negara Malaysia of 3.0. This indicates that houses in the area are in the “severely unaffordable” category. Factors such as slow income growth and rapid house price increases contribute to this situation.

Therefore, affordability can be defined as the capacity of a household to purchase a home without compromising other essential living expenses. When the ratio of house price to income increases, housing becomes less affordable, particularly for the middle-income group. Table 1 shows the standard classification rating of affordability based on the Median Multiple criteria.

Table 1: Classification Rating of Housing Affordability

Affordability Rating	Median Multiple	Affordability Level
Affordable	3.0 and below	Home prices are within reach of buyers
Moderately Unaffordable	3.1 to 4.0	Some affordability pressure
Seriously Unaffordable	4.1 to 5.0	Increasing difficulty to afford a home
Severely Unaffordable	Above 5.1	Homeownership is beyond typical income

Source: Bank Negara Malaysia (2022)

Housing affordability is commonly measured using the Median Multiple approach, which calculates the ratio between the median house price and the median annual household income (Bank Negara Malaysia, 2022). This method is widely recognized for its simplicity and clarity in showing how affordable housing is to the average population. For the M40 group, this affordability gap creates a major barrier to achieving homeownership in new urban areas like Batu Kawan. Although they do not qualify for government housing subsidies aimed at lower-income (B40) groups, their income still falls short of meeting current market demands.

Challenges of Homeownership for Middle-income Groups

Homeownership remains a pressing challenge for many Malaysian households, particularly the middle-income (M40) group. Several interrelated challenges, including limited loan eligibility, house prices outpacing income, rising cost of living, lack of affordable housing availability, economic and employment uncertainty and large number of dependents.

Each of the challenges are briefly defined as follows:

Limited Loan Eligibility

Many M40 households struggle with limited eligibility for housing loans due to high Debt Service Ratios (DSR), low disposable income and stringent lending policies. Although they earn more than the B40 group, M40 households often do not qualify for government assistance yet cannot meet bank requirements. Chai and Selvaratnam (2024) stated a declining home loan approval rate from 76%

(2014–2018) to 74.6% in 2019. Additionally, irregular income sources, such as gig or freelance work, further complicate loan approvals for younger M40 buyers in smart urban areas.

House Prices Outpacing Income

In smart cities, the cost of homes often includes the premium for digital infrastructure and smart technologies. This exacerbates the income-price mismatch. While house prices rose sharply from RM158,000 in 2010 to RM295,000 in 2020 (NAPIC, 2021), average incomes grew modestly and even declined during the pandemic. As a result, the Housing Affordability Ratio (HAR) in major cities surpasses the “severely unaffordable” threshold, particularly affecting M40 buyers (Bank Negara Malaysia, 2021).

Rising Cost of Living

The rising cost of basic needs such as food, housing, transportation and utilities reduces the M40’s ability to save for homeownership. Chai and Selvaratnam (2024) noted that these expenses account for over 65% of a typical M40 household’s monthly income, leaving minimal surplus for down payments or loan repayments. In smart cities like Batu Kawan, residents may also face higher maintenance and smart utility costs, further straining their finances (The Malaysian Reserve, 2023).

Lack of Affordable Housing Availability

The private housing market often prioritizes high-end developments, leaving few affordable units suitable for the M40. Ahmad and Ismail (2023) argue that developers are incentivized by profit margins to build homes priced above RM500,000. This shortage reduces the choices available to M40 households, especially in areas like Batu Kawan where land value and demand are high due to smart infrastructure and economic investments.

Economic and Employment Uncertainty

Post-pandemic recovery remains uneven and many M40 individuals face job insecurity, unstable income, or short-term contracts. Norazmawati and Nurul Shafiqah (2021) emphasize that financial institutions are reluctant to approve long-term housing loans for applicants with inconsistent employment histories. In a smart city environment, where housing demand and prices are high, such uncertainty further excludes M40 from secure homeownership opportunities.

Large Number of Dependents

Many M40 households support aging parents and children, especially in multigenerational family structures. This increases financial strain and reduces eligibility for housing loans due to higher monthly obligations. Noor Azlan (2022) reported that larger household sizes directly impact disposable income and loan repayment capacity, making it harder to qualify for home loans or afford quality housing in growing urban centers like Batu Kawan.

Broader Context on Homeownership Challenges for Middle-Income Groups

Homeownership for the middle-income group, or M40, presents a growing challenge in both developed and developing nations. While this group is often perceived to have sufficient income to afford housing, many faces systemic barriers due to mismatched property markets, stagnant income growth and inadequate housing policies. This section reviews the challenges of homeownership for the M40 group in three tiers: globally, nationally and case study in the specific context of Batu Kawan, Pulau Pinang. These contexts are briefly defined as follows:

Global Context

Globally, middle-income households increasingly struggle to achieve and sustain homeownership due to the widening gap between wages and property prices, particularly in urbanized regions. According to the World Bank (2021), cities worldwide are becoming unaffordable for middle-income earners due to speculative real estate investment, limited land supply and inflation. In major urban centres, residential properties have become financial assets rather than homes, which has driven prices beyond what is affordable using traditional housing affordability indicators such as the Median Multiple.

Additionally, many global cities face a shortage of housing supply suitable for middle-income buyers, as developers tend to focus on high-end housing projects with greater profit margins (UN-Habitat, 2020). The International Monetary Fund (IMF) also notes that the “missing middle” is often overlooked in housing policies, they earn too much to qualify for government subsidies yet not enough to access mortgage loans comfortably (International Monetary Fund, 2022). This phenomenon is prevalent in cities across Europe, Asia and Latin America, where M40-like groups face rising costs of living, increasing debt burdens and limited access to financing.

Malaysia Context

In Malaysia, the homeownership crisis among middle-income households mirrors global trends but is intensified by local socio-economic and policy-related factors. Bank Negara Malaysia (2021) highlighted that the national median house

price is severely unaffordable by international standards, with the Median Multiple consistently above 4.1, indicating serious affordability stress. Middle-income households, particularly those earning between RM4,850 and RM10,959 monthly, fall into a gap where they are neither eligible for low-cost housing programs nor able to afford private market housing (Sulaiman et al., 2021). The situation is further complicated by the rising cost of living, high rejection rates for home loans and limited housing supply within price ranges suitable for the M40 group (Ahmad & Ismail, 2023). Additionally, developers have shown a strong preference for high-margin luxury projects, neglecting the development of housing units below RM300,000 which are most needed by the middle-income population (Chai & Selvaratnam, 2024).

Within smart city developments, these national affordability pressures are further amplified rather than alleviated. In the context of smart city development, this uneven affordability reflects a structural mismatch between housing supply and middle-income demand. While Batu Kawan's smart city status has enhanced economic attractiveness, it has simultaneously intensified market-driven housing production, prioritizing higher-priced units.

Similar patterns have been documented in other Malaysian smart cities such as Cyberjaya and Iskandar Puteri, where large-scale planned developments and strong investment demand have driven rapid house price appreciation without a corresponding increase in affordable or mid-priced housing supply. Despite advanced infrastructure and employment opportunities, middle-income households in these areas continue to face difficulties in accessing homeownership due to price premiums, speculative development and limited policy intervention targeting the M40 group (Zulkifli et al., 2022).

Case Study Context

Batu Kawan, a rapidly developing township in Penang, has been positioned as a smart city hub, integrating advanced technologies, green infrastructure and sustainable urban planning. However, these developments have also triggered a sharp rise in property values, often placing homes out of reach for the middle-income group. According to Penang State Government reports and recent market listings, average house prices in Batu Kawan have exceeded RM450,000, which falls into the "seriously unaffordable" range based on the Median Multiple indicators when compared with M40 income levels.

The transformation of Batu Kawan into a smart city has drawn interest from high-income investors and developers targeting premium housing markets, thereby reducing the availability of affordable units for the M40. As noted by Sarkar & Kumar (2022), smart technologies embedded in modern housing add significant cost premiums, further limiting access for middle-income families. Moreover, despite the area's infrastructure development, many M40 households

face difficulties in securing loans, especially first-time buyers without stable employment or savings. This situation highlights a growing divide between smart city development goals and inclusive, affordable housing strategies.

Recent international studies show that housing is increasingly treated as an investment rather than a basic social need (IMF, 2022; UN-Habitat, 2020). In smart cities, this trend is even stronger, as high-tech infrastructure and smart-city branding attract investors, pushing property prices beyond what middle-income households can afford. This has led to the so-called “missing middle” phenomenon, where middle-income families are often left out of both public housing support and the private housing market (World Bank, 2021).

In Malaysia, while research recognizes that the M40 group faces affordability stress, few studies have explored how smart city policies and developments contribute to this problem. This study fills that gap by connecting smart city development with housing affordability challenges, going beyond simple price-to-income calculations to understand the structural barriers that middle-income households experience.

RESEARCH METHODOLOGY

This study uses a quantitative research approach to explore the challenges faced by the middle-income (M40) group in owning a home in Batu Kawan, Pulau Pinang. A cross-sectional survey design was chosen because it helps capture the financial situation and homeownership experiences of respondents at a specific point in time. This design is well-suited to the study’s aim of understanding current housing affordability levels and the difficulties encountered by the M40 population living in a smart city environment.

To collect the necessary data, a structured questionnaire was used. This format made it easier to gather consistent and reliable responses from a larger number of people. The questionnaire was divided into four (4) sections, each focusing on different aspects which are Respondent Background, Income and Household Dependent, Homeownership Status and Homeownership Challenges. The information collected allowed the researcher to conduct key analyses like descriptive analysis, the Housing Affordability Ratio (HAR) and mean analysis to help understand the level of affordability and homeownership challenges.

The questionnaire was distributed randomly to selected M40 respondents aged 21 to 60 who either live or work in Batu Kawan. The individuals classified under the M40 groups as defined by the Department of Statistics Malaysia (2022), with a monthly household income range between RM4,851 and RM10,970. In addition, these criteria were selected, as this age range corresponds with the eligible bracket for housing loan applications in Malaysia.

Batu Kawan was selected as the focus area because it is undergoing rapid development under the Penang State Government’s smart city plans. The

city is experiencing high rates of in-migration, modern infrastructure expansion and rising property values, all of which have implications for housing affordability. According to Lim and Tan (2023), smart city development often leads to increased housing demand and higher living costs, which may disproportionately affect the middle-income segment. Thus, the cross-sectional method is suitable as it allows the research to capture affordability issues during the current phase of urban growth.

According to Chua (2006), sampling refers to the process of selecting a number of subjects from the population to serve as research respondents. Based on the population data of Batu Kawan, which was 85,900 people in 2022 (Department of Statistics Malaysia, 2023), it is estimated that 65 percent of them are individuals aged between 21 and 60 years, resulting in an estimated target population of 55,835 people. Therefore, the Taro Yamane formula (1973) was used to determine the sample size at a confidence level of 90% and a margin of error of 0.10. Based on this calculation, a total of 100 respondents were selected.

The choice of a 90% confidence level with a 0.10 margin of error was informed by practical and contextual considerations. Given the exploratory nature of this study and constraints related to time, access and respondent availability, this confidence level is deemed acceptable for preliminary empirical investigations in urban housing research (Chua, 2006). Similar confidence thresholds have been applied in previous housing affordability studies where population access is limited and the research objective is diagnostic rather than predictive. Despite its contributions, this study is subject to several limitations. First, the sample size of 100 respondents, while statistically acceptable, may not fully capture the heterogeneity of the M40 population in Batu Kawan. Second, the cross-sectional design limits the ability to observe affordability dynamics over time, particularly in a rapidly developing smart city environment. Third, reliance on self-reported data may introduce perception bias. These limitations should be considered when interpreting the findings and provide directions for future longitudinal and mixed-method research.

The data collected was analysed using SPSS software and Excel for data formula, where different techniques were applied based on the research objectives. To measure affordability (Objective 1), the Housing Affordability Ratio was used, comparing household income to monthly housing costs. Ratios above 30% were considered unaffordable (refer Table 2). HAR is calculated using the following formula:

$$\text{HAR} = \left(\frac{\text{Monthly Housing Payment}}{\text{Monthly Household Income}} \right) \times 100\%$$

Table 2: Housing Affordability Ratio Category

HAR %	Category
≤ 30%	Affordable
> 30%	Unaffordable

Source: Bank Negara Malaysia (2022)

To assess the challenges faced by the M40 group (Objective 2), a mean score analysis was conducted on responses from a Likert scale. Higher scores indicated more serious challenges (refer Table 3).

Table 3: Mean Score

Mean Score	Classification
1.00 - 1.99	No Challenge
2.00 - 2.99	Low
3.00 - 3.99	Moderate
4.00 - 4.99	High
5.00	Very High

Source: Irweeda Naim & Abdul Manaf (2022)

To ensure the study's quality, the questionnaire was reviewed by academic experts and tested through the pilot study of 20 respondent. Table 4 shows the value of Cronbach's Alpha that was used to check the internal reliability of the questions and results showed 0.809 (strong consistency) which means the questions effectively measured what they were meant to.

Table 4: Reliability Index

Construct	Items	Cronbach's α
Homeownership Challenges for Middle-income Groups	D1 - D18	0.809

ANALYSIS AND DISCUSSION

The Housing Affordability Ratio (HAR) analysis conducted on 100 respondents as shown in Table 5 revealed that 64% of them fall within the affordable category, where their HAR is 30% or less of their household's monthly income. On the other hand, 36% of respondents recorded an HAR exceeding 30%, indicating they are experiencing a high financial burden in their attempt to own a home and are thus categorized as unaffordable.

Table 5: Loan Difficulty Distribution by Household Income Category.

HAR Category	Total Respondent	Percentage (%)
≤ 30% (Affordable)	64	64%
> 30% (Unaffordable)	36	36%
Average of HAR (%)		28.7%

Source: Data and Author's Calculation

The average HAR among all respondents is 28.7%, which is still within the international affordability benchmark of not exceeding 30% of household income. However, the percentage of respondents falling into the unaffordable category is notable, indicating that a significant portion of the M40 group in Batu Kawan still faces financial pressure regarding homeownership.

For instance, respondents with a monthly income of RM6,490 (midpoint) and housing payments between RM750–RM1,250 per month would result in an HAR of approximately 11.5% to 19.25%, which is well below the 30% threshold set by Bank Negara Malaysia. This suggests that many M40 households in Batu Kawan are relatively able to bear housing costs. However, the affordability gap becomes evident when monthly payments exceed RM1,500, especially for those in the lower-income range within the middle-income group (RM4,851–5,880).

Nevertheless, it is important to note that other factors, such as the number of dependents and existing financial commitments, may affect actual homeownership capability. The HAR calculated here only provides a preliminary picture of affordability based solely on income and housing payments. These findings are consistent with the study by Wong et al. (2023), which emphasize that the rising cost of living and the widening gap between house prices and income make it difficult for the middle-income group to own a home, particularly in urban or developing areas such as Batu Kawan. This also reflects a key challenge in achieving the goals of the National Housing Policy, which aims to ensure inclusive and affordable homeownership for all segments of society. Although the average HAR indicates affordability at an aggregate level, the coexistence of affordable and unaffordable households within the same income category suggests uneven affordability outcomes among the M40 group. This finding supports the argument that affordability cannot be fully understood through ratio-based indicators alone, as household composition, debt obligations and cost-of-living pressures significantly mediate actual homeownership capacity.

Table 6 shows the overall item for homeownership challenges faced by the middle-income group (M40) in Batu Kawan. A 5-point Likert scale was applied from [1] Strongly Disagree to [5] Strongly Agree. Respondents' level of agreement on homeownership challenges was examined by analyzing the mean

score for each statement. The results were then classified based on the classification method used in the study by Irweeda Naim & Abdul Manaf (2022), which categorizes the scores into five levels, as shown in Table 3.

Table 6: Mean Score Analysis of Each Statement

No.	Statement	Mean	S.D
Limited Loan Eligibility			
D1	I face difficulties obtaining a housing loan from the bank.	4.14	0.89
D2	My loan eligibility is insufficient to purchase a house in Batu Kawan.	4.21	0.80
D3	The loan application process is too strict and makes homeownership difficult.	4.05	0.88
House Prices Outpacing Income			
D4	The house prices offered are far beyond my income capacity.	4.51	0.64
D5	I cannot afford to buy a house because my monthly salary is too low compared to house prices.	4.29	0.78
D6	My income does not keep up with the increase in house price in Batu Kawan.	4.31	0.70
Rising Cost of Living			
D7	The rising cost of living prevents me from saving to buy a house.	4.09	0.91
D8	My current daily expenses are too high to consider owning a home.	4.66	0.61
D9	I have to postpone buying a house due to increasing monthly financial burdens.	3.52	1.12
Lack of Houses in Suitable Price Range			
D10	It is difficult to find a house within my affordable price range	4.17	0.77
D11	Most new housing projects in Batu Kawan are beyond my financial limit.	3.59	1.10
D12	Affordable housing options are very limited in this area.	3.90	0.85
Economic and Employment Uncertainty			
D13	Job insecurity makes me hesitant to purchase a house.	4.36	0.71
D14	I am worried about making long-term commitments such as a housing loan due to the unstable economy.	3.76	0.97
D15	The risk of losing my job affects my decision to buy a house.	4.09	0.75
Large Number of Dependents			
D16	Having many dependents affects my financial capability.	4.09	0.79
D17	Monthly expenses for family members greatly limit my ability to save for a house.	3.96	0.81
D18	The number of my dependents makes it difficult for me to commit to a housing loan.	3.62	0.93

Source: Data and Author's Calculation

The findings reveal that the most significant challenge faced by respondents is the mismatch between house prices and income, with the highest average score recorded at mean = 4.37 ($\sigma = 0.71$). This indicates a high level of concern among the M40 group that their income is not sufficient to meet the rising

cost of housing in the Batu Kawan smart city area. This issue reflects the affordability gap, where housing prices are increasing faster than wage growth. This concern is also supported by Mokhtar et al. (2022), who highlighted similar affordability struggles in Pulau Pinang's urban context. The second highest challenge is limited loan eligibility, with a mean score of 4.13 ($\sigma = 0.86$). Respondents feel that bank loan requirements are too rigid, making it difficult to qualify for financing. This is consistent with findings from Norazmawati and Nurul Shafiqah (2021), who noted that young buyers often face eligibility barriers despite steady incomes.

The rising cost of living is also a significant barrier, with a mean score of 4.09 ($\sigma = 0.88$). Many respondents report that high daily expenses prevent them from saving for home purchases. This aligns with national trends in inflation and cost pressures, which have disproportionately affected the middle-income group (Musaddad et al., 2023). Another prominent issue is economic and employment uncertainty (mean = 4.07, $\sigma = 0.81$). Many individuals are hesitant to commit to long-term loans due to unstable job markets or fear of retrenchment especially relevant in the post-pandemic context.

CONCLUSION

This study was undertaken in response to growing concerns that middle-income (M40) households, despite being relatively economically stable, are increasingly struggling to access homeownership, particularly in urban and smart city developments. As Batu Kawan continues to evolve into a strategic smart city hub, ensuring equitable access to housing for middle-income groups has become a critical policy concern.

Housing affordability was assessed using the Housing Affordability Ratio (HAR), which recorded an average value of 28.7%, within the widely accepted affordability benchmark of 30%. While this suggests that housing costs are manageable at an aggregate level, the findings reveal notable disparities within the M40 group. Respondents in the lower M40 sub-groups (M10 and M20) continue to face substantial challenges in meeting housing expenses and loan repayments, indicating that average affordability indicators may mask underlying affordability stress among vulnerable segments.

Beyond objective affordability measures, the study also identified strong perceptions of financial pressure and structural barriers to homeownership. Analysis of six key housing challenges shows that the most critical issue is the mismatch between house prices and income growth (mean = 4.37, $\sigma = 0.71$), reflecting widespread concern that escalating property prices have outpaced household earnings. Other high-impact challenges include limited loan eligibility, rising living costs and economic and employment uncertainty, further constraining homeownership opportunities for the M40 group.

By situating these findings within a smart city development context, this study contributes to the literature by demonstrating that technology-driven urban growth may intensify affordability pressures for middle-income households. The results highlight the limitations of relying solely on aggregate affordability metrics and underscore the importance of incorporating household-level experiences and perceptions into affordability assessments.

From a policy perspective, the findings point to the need for more inclusive smart city housing strategies. These include revisiting planning controls, promoting the supply of mid-priced housing and embedding affordability objectives within smart city master plans. Without targeted interventions, smart city developments risk reinforcing socio-spatial inequalities rather than supporting inclusive and sustainable urban growth.

Overall, this research provides valuable empirical evidence to inform policymakers, urban planners and housing stakeholders involved in smart city development. It also establishes a foundation for future research to explore comparative smart city contexts, adopt longitudinal approaches and incorporate qualitative insights to deepen understanding of homeownership challenges in Malaysia's rapidly evolving urban landscape.

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