

**ANALYSING THE INFLUENTIAL FACTORS OF SUSTAINABLE
HOUSING AFFORDABILITY IN MALAYSIA**

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**A project report submitted in partial fulfilment of the
requirements for the award of Bachelor of Science
(Honours) Quantity Surveying**

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April 2021

DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions.

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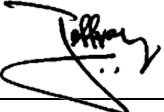
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APPROVAL FOR SUBMISSION

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ABSTRACT

Housing affordability has become a pressing concern across the globe. Accordingly, there are real tensions in the policy planning to provide affordable housing, as well as achieve sustainable development. In order to abate this issue, a total of 20 critical factors influencing sustainable affordable housing, housing preferences based on 7 different demographic factors and 10 policy tactics to mitigate affordable housing gap were determined through comprehensive literature review in this research. This study adopted quantitative research method by which the data were acquired from 120 respondents through questionnaire survey within the Klang Valley area. Subsequently, the reliability of the data was tested by using Cronbach's reliability test. Internal consistency has been achieved and thus the data is valid to proceed for other tests. For mean ranking, the top five most agreed influential factors of sustainable housing affordability were revealed as: (1) Housing price in relation to income; (2) Crime rate; (3) Availability of mortgage and interest rate; (4) Rental price in relation to income; (5) Employment opportunities accessibility. Meanwhile, (1) Crime rate, (2) Housing price in relation to income and (3) Quality performance of housing were perceived as first three fundamental housing preferences amongst respondents. Furthermore, the top 3 strategic measures to reduce affordable housing gap were (1) Mitigate rejection of housing loans from bank, (2) Reduce the construction cost for affordable housing and (3) Provide housing schemes. Furthermore, Kruskal-Wallis test indicated that there are significant differences between respondents groups' perceptions on the variables. Lastly, factor analysis has uncovered a total of 5 underlying factors, namely values and lifestyles, safety and satisfactions, economic sustainability, environmental and accessibility. By identifying the influential factors of sustainable affordable housing, these could be pivotal interventions to provide insight to real estate developers, government agencies and architects to rely on these influential factors in the affordable housing projects.

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LIST OF SYMBOLS / ABBREVIATIONS

α	Cronbach's alpha value
δ	Standard deviation
VAT	Value-Added Tax
EPF	Employee Prudential Fund
IBS	Industrialised Building System
CCRIS	Central Credit Reference Information System
ORS	Open Registration System
LIE	Low Income Earners
LTAT	Lembaga Tabung Angkatan Tentera
PR1MA	Perumahan Rakyat 1Malaysia
FELDA	Lembaga Kemajuan Tanah Persekutuan
AKPK	Credit Counselling and Debt Management Agency
MPF	My First Home Scheme
KMO	Kaiser-Meyer-Olkin
PCA	Principal Component Analysis
HVAC	Heating, Ventilation and Air Conditioning

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, background and problem statement of sustainable housing affordability in Malaysia will be discussed. Furthermore, this chapter also identified the research objectives and questions which needed to be achieved in the end of this study. Subsequently, research aim, research scope, research significance and justifications, report outline and conclusion were also included in this chapter.

1.2 Background

As reported by World Bank Group (2019), one of the biggest expenditures for most households is housing, which is the basic necessity for every individual followed by water and food. Housing provides a place of security and shelter that are needed by every human being and it also plays a crucial role in the national economies. This may owe to the fact that expenditure on housing is considered as a significant component for economic development of a nation.

Nevertheless, housing affordability is currently a crisis faced by most of the countries. Sustainable affordable housing is defined as a shelter that is adequate in demographic factors such as location, quality, safety and many others. In addition, affordable housing allows households to meet their other basic living needs instead of just devoting all the income on housing. Bank Negara Malaysia (2017) stated that there are two major components have affected the housing affordability, namely house purchasing cost and keeping cost of the house, which are also determined by monthly debt repayment, down payment and others. If the housing costs are too costly, households have to reduce expenditures in order to keep sheltered. In recent decades, housing affordability crisis is getting serious worldwide and this has reflected housing costs rising faster than household income (Wetzstein, 2017).

Furthermore, one of the approaches that are frequently used in defining housing affordability is Median Multiple (Bank Negara Malaysia, 2017). Median multiple that has exceeded 5.0 will be categorized as severely

unaffordable and Malaysia's median multiple was at 5.0 (Cheah, Almeida and Ho, 2017). According to a study by Chung, et al. (2020), Hong Kong is one of the most developed countries, however, the housing affordability ratio in Hong Kong is the highest in the world with 20.9 of median multiple in 2018. Meanwhile, the housing affordability in London was 8.3, followed by New York at 5.5. In this scenario, housing has occupied a major part of some of the individual's income which they need to give up other options such as education, healthcare, choices of food and transportation. Other than that, some of these individuals are forced to stay in a badly maintained or overcrowded shelter. For worse possible situations, some people will be homeless due to being forced to face evictions and priced out of housing markets. In addition, housing affordability has limited young people's choices between having childbirth or homeownership. Alarmingly, house affordability is likely to get worse all around the world in 10 years' time and people will be forced to stay in substandard and crowded accommodation conditions (Wetzstein, 2017) where Hong Kong is the ideal example in suffering from housing affordability.

In Malaysia, many urban areas such as Kuala Lumpur and Selangor are having rapid development that led to immensely increase in property market price (Suhaida, et al., 2011). Based on the statistics for the first half of 2020 provided by the National Property Information Center (2020), Johor has the highest percentage of overhang residential units at 18.40%, followed by 16.56% in Perak, Selangor at 16.31% and 10.25% in Penang. Completed and new units but not being sold after six months will be categorized as overhang units. Overall, there are a total of 29,698 units of overhang residential units for the first half of year 2020 in Malaysia. This situation has indicated that the mismatches of household income and house cost are likely to get worse. However, measuring affordable housing is not only about price, but also need to consider the sustainability of housing. Nowadays, affordability and sustainability are frequently examined mutually and also acknowledged as crucial factors in housing. Therefore, it is vital to tackle issues of sustainability and affordability simultaneously (Mulliner, Smallbone and Maliene, 2013).

1.3 Problem Statement

In recent years, a large number of people cannot afford to own a property as the price of houses has spiralled worldwide. Affordable housing is not only a widespread and severe issue facing in Malaysia but also other countries across the globe (Olanrewaju and Idrus, 2020). Yap and Ng (2018) also claimed that housing affordability crisis in Malaysia is caused by imbalance rate of growth of household income and house prices. Apart from that, the issue of affordability in short term might be due to the gap of supply and demand, as well as sustainability issue. Nevertheless, it might have different reasons in the long term which should be relevant to the rapid growth of housing costs but with moderate increasing of household income.

According to Financial Surveillance Department director of Bank Negara Malaysia, Qaiser Iskandar Anwarudin declared that if the house price is not more than threefold of a person's annual income, the house will be considered as affordable based on the median multiple methodology (Cheah, Almeida and Ho, 2017). According to Khazanah Research Institute (2019), houses in Malaysia are severely unaffordable with a 5.0 of median multiple in 2016 measured according to the international standard. In 2016, the maximum affordable house price was RM282,000 based on the publication of Bank Negara Malaysia (BNM). However, the median house cost in reality was RM313,000, whilst the median household income in Malaysia was only RM5,228.

Housing affordability in Malaysia has deteriorated started from year 2002. It has shown the most significant deterioration between 2012 and 2014 for most states (Khazanah Research Institute, 2019). Yates, et al. (2007) stated that housing affordability is crucial as it does not only impose on household for experiencing high cost of houses, but also affect the society and economy of the country. According to the World Bank 2020, it is undeniable that one of the most open economy countries in the world is Malaysia, which is sensitive to exchange rate shocks and interest. Therefore, high housing cost will impact on macro economy as a whole. The increment of the interest rate caused an excessive debt burdens for the home buyers. Consequently, a slight change in interest rate can affect household's spending power; they will reduce their consumption in order to meet their debt payments. On a larger scale, national

consumption income will reduce due to the majority of the population cut back on expenditure and thus creating the greater unstable economy of the country. Besides, inflationary pressures will also be affected by high housing prices.

In addition, Wang, Jung and Lim (2012) mentioned that there is an impact on societal development caused by high housing costs. According to the study, household life course decisions, namely child rearing, household size and etc can be adjusted based on their housing affordability. For instance, marriage rate is inversely correlated with house cost (Farnham, Schmidt and Sevak, 2011) and the probability of independent living is related to house price and housing market circumstances. Wang, Jung and Lim (2012) have further found out that due to the crisis of housing affordability, lots of young adults have decided to delay or refuse childbirth and marriage. On this account, housing affordability has a huge impact on the decision of household life that has led to setback of societal development.

Housing affordability crisis also has an effect on mental and physical health. Chung, et al. (2020) who had undertaken a research about the housing affordability stress in Hong Kong. Alarmingly, there was a stimulus response for the result, that is, the higher the housing price, the higher the stress level of housing affordability and thus physical and mental health get worse. In fact, housing affordability stress is threatening the mental and physical health of a person independently in spite of taking into considerations of the effects by other factors, such as socio-economic, socio-demographic and many others. Furthermore, Chung et al. (2020) also grimly highlighted that there were important indirect effects of deprivation on physical health (34.3%) and mental health (15.8%) by housing affordability stress. Hence, high housing costs can impact on mental and physical health negatively.

Unaffordable housing is always evaluated with incapability of a household to pay a loan or self-assessment of burden (Downing, 2016). Besides, Baker, et al. (2019) further defined that the occurrence of unaffordable housing is when an individual spends more than 30 percent of their total income in mortgage or rent. Based on a study of Chakrabarti and Zhang (2015), unaffordable housing has brought negative impacts on employment growth, particularly in areas which has the rapid growth of housing price. This is because areas with expensive housing costs will increase

the business cost and living costs, which led to less interested for people in doing their business in that area. Therefore, the employment rate of that area will decline which slow down the economy of the nation. In other words, employment growth is slower in areas with unaffordable housing due to high land rent and inelasticity of land supply.

Housing affordability are commonly examined and studied; however, studies on sustainability housing affordability are limited in Malaysia. An affordable house is not simply about cheap; sustainability of housing is also a very important consideration that should not be overlooked. Therefore, it is essential to bridge the gap of affordability and sustainability of housing by figuring out the criteria for sustainable housing affordability which could be pivotal interventions to provide insight to real estate developers, government agencies and architects to rely on these influential factors when building affordable housing. Moreover, most of the studies on housing preferences are basically focused on first time homebuyers. As such, housing preferences based on different demographic factors will be tested in this research in order to act as a guide to the developers and the government in planning for the development of sustainable affordable housing projects in the future.

1.4 Research Aim

The purpose of these findings is to explore the influential factors of sustainable housing affordability in Malaysia. Subsequently, it can facilitate policymakers in their decision making in the development planning for affordable housing, as well as achieve sustainable development.

1.5 Research Questions

1. What are the critical factors affecting sustainable housing affordability in Malaysia?
2. What is the relationship between demographic factors and housing preferences?
3. How to reduce the affordable housing gap in Malaysia?

1.6 Research Objectives

1. To investigate the critical factors affecting sustainable housing affordability in Malaysia.
2. To determine the relationship between demographic factors and housing preferences.
3. To recommend strategic measures to reduce the affordable housing gap in Malaysia.

1.7 Research Scope

This research is focusing on identifying the influential factors of sustainable housing affordability in Malaysia. Besides, this study also discovered housing preferences for a sustainable affordable house based on different demographic factors, as well as policy actions to mitigate the affordable housing gap. Meanwhile, questionnaires were prepared and distributed to respondents with distinct backgrounds in West Malaysia, particularly in the Klang Valley area. This is due to the fact that Klang Valley areas are the most populated and developed urban areas, and thus, these conditions can address the problem of housing affordability. Besides, the respondents targeted in this study have to be at aged 18 and above due to the minimum age requirement that are qualified to purchase a house in Malaysia is 18 years old.

1.8 Research Significance and Justification

In recent years, housing in Malaysia is getting severely unaffordable due to the price spiral of property. Therefore, strategic measures for dealing with this issue have to be worked on to solve the housing affordability gap in Malaysia. Affordable housing is just not simply about cheap, sustainability is very important when purchasing a house. Nevertheless, it is important to figure out the influential factors of sustainable affordable housing. As such, the identified critical factors could be pivotal interventions to give an overview to real estate developers, government agencies and architects. Therefore, resources allocation in the development of sustainable affordable housing can be planned effectively.

On top of that, this research study is significant to housing affordability issues in Malaysia as the determined critical factors allow policy makers to

identify ideal locations for sustainable affordable housing projects. Besides, it is also beneficial to the government, developers and the urban planners to act as a guide in future planning for the sustainable affordable housing projects, as well as implement possible improvement actions to mitigate the affordable housing gap. On the other hand, this research can also act as a guide to potential homebuyers.

1.9 Research Outline

This study is structured into five chapters which are introduction, literature review, research methodology, results and discussion and conclusions and recommendations. The outline of this study is described as below:

1.9.1 Chapter 1: Introduction

In this chapter, it provides a better understanding on the overall content of this research study. A total of 10 sub-topics will be discussed in this chapter, namely general introduction, background of the study, problem statement, research aim, research objectives, research questions, research scope, research significance and justification, conclusions and recommendation. Last but not least, an overall conclusion will also be mentioned at the end of this chapter.

1.9.2 Chapter 2: Literature Review

Literature review gives an overview of the study based on past research, which the previous research relevant to this topic will be analysed, evaluated and summarized in this chapter. Firstly, the definition of housing affordability will be elaborated in order to provide a better knowledge on this topic. Subsequently, this chapter has also highlighted the relationship between housing preferences and demographic factors. Also, the possible solution to reduce the gap of affordable housing will also be emphasized at the last part of this chapter. Apart from that, summary for each research objective by different authors will be tabulated and a conclusion will be discoursed at the end of this chapter.

1.9.3 Chapter 3: Research Methodology

After the literature review, this chapter will highlight the mechanism and method that are used to complete this research. Also, this chapter includes

research types, research design, sampling design, research method, research process, method of data collection and data analysis. At the end of this chapter, a conclusion will be drawn to summarise the overall content.

1.9.4 Chapter 4: Results and Discussion

After collecting the data from the respondents, the results will be presented, analysed and discussed in this chapter. The generated result will then be assessed to figure out whether it has met the objectives of this research. Lastly, a conclusion will be made at the end of the chapter.

1.9.5 Chapter 5: Conclusions and Recommendations

A conclusion will be drawn based on the overall findings and result from the research. Moreover, recommendation for future related research will also be provided in this chapter.

1.10 Summary

Majority of the Malaysians could not afford a house due to insufficient of income and high housing cost. In recent years, housing in Malaysia has become seriously unaffordable according to the international standard. Housing affordability is a severe problem that not only affects on households, but also will have a direct impact on the economy of a nation. An affordable house is not just simply about low cost, but also need to consider about the sustainability of the house. Therefore, it is crucial to figure out the factors influencing sustainable affordable housing and the preferences of the homebuyers. Besides, recommendations to bridge the affordable housing gap is fundamental to solve this issue. This research is carried out with the intention of allowing the government and the developers to have a clear understanding about the needs and demand in the market, and thus more sustainable affordable housing can be supplied in Malaysia.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This literature review is conducted to determine the relevant theories and gaps in the existing research. In order to enhance a better understanding of this study, the definition of sustainable housing affordability is elaborated in this chapter. Besides, the bulk of this chapter has discussed the influential criteria of sustainable housing affordability and the relationship between demographic factors and housing preferences. Subsequently, strategies to reduce the affordable housing gap will also be highlighted in the last part of this chapter.

2.2 Background

Housing is a fundamental social condition that describes the life gratification and wellbeing of the inhabitants (Chan and Adabre, 2019). What is sustainable affordable housing? Housing which is reasonably adequate in location, price and standard will be considered as sustainable affordable housing (Lim, et al., 2018). According to Stone (2006), it can be described as an interpretation of the material and social experience of people, namely households, with respect to their housing conditions. In addition, Chan and Adabre (2019) stated that the rule of thumb of affordable housing is that households spend less than three tenths of their annual income on housing.

Other than that, affordability also includes that households need to be able to achieve other essential cost of living on a sustainable basis after paying bills of house. In a case that if the household cannot meet the other basic needs such as clothing, food and health care, he will be considered as “shelter poor”. Gan, et al. (2017) argued that the housing affordability for low-income or middle-income households have not been improved even though there are a lot of affordable housing programs that have been begun globally. For instance, there might be an increment of expenditure on transportation, utilities bills, medical care and others when staying in an affordable house. Therefore, housing affordability has been deteriorated by the increment of spending on non-housing matters.

2.3 Influential Factors of Sustainable Housing Affordability

2.3.1 Housing Cost in relation to Income

Household income is one of the most crucial factors influencing the purchase decision of home buyers (Mulliner, Smallbone and Maliene, 2013; Mulliner, Malys and Maliene, 2016; Chan and Adabre, 2019; Saidu and Yeom, 2020; Stone, 2006). This is because income will decide a person's purchasing ability on costs and types of houses (Bujang, et al., 2017). Based on the research of Bujang, et al. (2017), only approximate 20 percent of households having high income in Malaysia. Homeownership on the consumption of housing and households' purchasing power will be affected by the increment of housing costs annually, especially to the low and middle income households.

Furthermore, Soon and Tan (2019) also stated that household income is one of the major determinants of sustainable housing affordability in Malaysia. However, the increment of household income is much slower than the quick growth in housing cost which has led to seriously unaffordable for residential houses in Malaysia. Consequently, high housing prices have caused a crucial issue for low and middle income house buyers in owning a house since there is a huge gap between housing cost and household salary. Based on the rule of thumb, the amount of the money that needs to be allocated to purchase a house should be only 30% of the household's monthly income. As household income grows, the level of housing affordability will also increase. Hence, the amount of money that can be assigned to the cost of housing relies on the level of income (Bujang, et al., 2017). The housing cost in relation to income will affect the accessibility of an area directly. For example, some households will experience less accessibility with higher house price to income ratios (Mulliner and Maliene, 2011). Saidu and Yeom (2020) have also revealed that "housing cost in relation to income" has been ranked on top as success criteria influencing sustainable and affordable housing.

2.3.2 Rental Price in relation to Income

For critical criteria of sustainable housing affordability, rental costs in relation to income is as important as house price in relation to income (Adabre and Chan, 2018; Mulliner, Malys and Maliene, 2016; Mulliner, Smallbone and Maliene, 2013; Saidu and Yeom, 2020). Isalou, Litman and Shahmoradi (2014)

highlighted that evaluation housing affordability by the British Chartered Institute of Housing is based on rental rates. The rental cost in connection with household income is applicable as measurement for the housing economic viability (Adabre and Chan, 2018).

Besides, “affordability” related to the requirement for rental contracts (Quigley and Raphael, 2004) where high rental costs will cause a significant problem for low and middle income households in buying a house as there is a wide gap between household income and rental price (Soon and Tan, 2019). “Rental price in relation to income” has been ranked as second on the list of success factors affecting sustainable housing affordability in the research of Saidu and Yeom (2020).

2.3.3 Availability of Mortgage and Interest Rate

Availability of mortgage and interest rate is one of the crucial factors for sustainable housing affordability (Mulliner, Smallbone and Maliene, 2013; Chan and Adabre, 2019; Mulliner, Malys and Maliene, 2016; Adabre, et al., 2020). According to Soon and Tan (2019), high interest rate of housing loans has hindered the purchasing power of households. This has become a serious issue as some households are feeling burdened by the loans.

Said et al. (2014) mentioned that the majority of the home purchasers depend on financial assistance such as mortgage interest payments and down payment to purchase a house. Accordingly, financial institutions in Malaysia tend to allocate funds to support the home buyers in order to compromise with the current economic situation. For instance, financial service provided by Bank Simpanan Nasional to consumers at large, housing loans by housing credit institutions comprise commercial banks, Malaysia Building Society Berhad introduced deposit taking activities and housing loans services to the public and many others. Furthermore, in order to achieve economic sustainability, the mortgage payment for housing should not exceed more than 30 percent of the household’s salary (Bujang, et al., 2017). Anyhow, it is certain that availability of mortgage is the main financing approach for households since housing is a basic need for human beings (Liu and Li, 2018).

2.3.4 Availability of Incentives

According to Ng (2019); Soon and Tan (2019), owning a homeownership is tough for the majority of Malaysians. Accordingly, in order to lighten the financial burdens of homebuyers, there are several incentives arising from the government. For instance, deposit assistance, exemptions for stamp duty and others.

“Youth Housing Scheme” is one of the housing schemes offered by the government. This scheme offers house loan up to 100% to own the first house, which is eligible for married or single youths aged between 25 and 40 years old. Other than that, another incentive that is provided by the government is “My First Home Scheme”. It allows first-time homebuyers to own a house with exemptions of 10% down payment but with terms and conditions. Besides, Bank Negara Malaysia has established one million funds to help low income first-time homebuyers to get an affordable house that costs RM150,000 and below. Anyhow, availability of incentives by the government is one of the major influential factors for sustainable housing affordability.

2.3.5 Availability of Public Transport Services

In order to develop a thriving community and an adequate place for staying, it is crucial to ensure availability of good public transport services near to housing areas (Tan, 2013; Mulliner, Smallbone and Maliene, 2013; Mulliner and Maliene, 2011; Yap, Yong and Skitmore, 2019). Isalou, Litman and Shahmoradi (2014) mentioned that low cost housing are not always affordable if high transportation cost is required in the circumstances where the house is situated in areas with poor accessibility. Also, by enhancing affordable transport modes can increase affordability of a household (Isalou, Litman and Shahmoradi, 2014). Based on the studies of Mulliner and Maliene (2011), housing sustainability demands housing with easy accessibility to the public transport facilities. Meanwhile, transit-rich areas can positively influence disposable income of households, which signifies transportation costs have a direct effect on housing affordability.

Housing with low accessibility to public transportation services not only will affect on household's income and time, but also create various consequences. For instance, by using own private vehicles will cause pollution

emissions increased, higher rate of accident and higher consumption of energy. Moreover, economic opportunities reduced for household who do not have their own transportation (Isalou, Litman and Shahmoradi, 2014). Therefore, it is important to improve the public transport system as it is one of the most effective methods to help lower income households for improving their quality of life and adding value to their living surroundings (Tan, 2013).

According to (Yap and Goh, 2017), the Malaysia government has promoted transit-oriented development (TOD) which is a development that offers services, job opportunities and accommodation for transit passengers. Sabri, Ludin and Johar (2013) also further declared that TOD encourages public transport to combine with affordable housing to be the most advantageous plan. TOD not only creates a green transportation system, but also can reduce traffic congestion and provide low cost for parking. Most importantly, TOD has enhanced the idea of liveable communities by featuring affordable housing and good transit (Gomez, Omar and Nallusamy, 2019). In conclusion, lower income households can improve their life quality by allowing easy access to public transportation facilities provided (Sabri, Ludin and Johar, 2013). As such, developers should consider building affordable housing near to public transportation services.

2.3.6 Availability of Waste Management

“A sustainable community uses its resources to meet current needs while ensuring that adequate resources are available for future generations. It seeks improved public health and better quality of life for all its residents by limiting waste, preventing pollution, maximizing conservation and promoting efficiency, and developing local resources to revitalize the local economy.” (Ajayi 2020, p.15) Therefore, a good practice of waste minimisation and waste disposal should be implemented with the intention of creating sustainable communities (Mulliner and Maliene, 2011). Ajayi (2020) claimed that waste generated by humans is growing almost universally.

In Malaysia, one of the largest sources of urban waste is household area (Moh and Abd Manaf, 2014). Households dump their waste indiscriminately with no alternative since the waste management facilities are minimal (Ajayi, 2019), therefore, waste management facilities should not

overlooked in sustainable housing projects (Mulliner and Maliene, 2011; Gan, et al., 2017; Mulliner, Smallbone and Maliene, 2013). Lee and Paik (2011) conducted a survey and discovered that there is an influence on waste management behaviours in relation to the presence of recycling bins near housing, the accessibility of waste management facilities and the intervals for household garbage collection. In short, waste management is a determinant for housing sustainability as well as other components such as affordability and accessibility (Lee and Paik, 2011). In contrary, Mulliner and Maliene (2011) combated that the lowest average score for criteria of sustainable housing affordability in the research is availability of waste management facilities. This is because availability of waste management facilities only has direct effect on sustainability, but did not have significant impact on households' economy.

2.3.7 Availability of Green Public Spaces

City residents always feel intensive pressure from works and less in-person social interaction. For this reason, the existence of public green space is fundamental as it can greatly alleviate such social issues and able to create appealing environment to households (Zhou and Rana, 2012).

Public green space is openly accessible outdoor areas with facilities which considered as public assets, such as gardens, parks, human-modified location and many others (Li and Liu, 2016). Zhou and Rana (2012) indicated that public green space has provided an appealing, relaxation and recreation environment to households. On top of that, it also acts as air pollution purifier, climate regulator. Not only that, public green space can help to mitigate noise and conserve rainwater that contributes positively to environmental sustainability. Additionally, space economic value also can be boosted up and community social gap can be reduced by creating green public space (Li and Liu, 2016). Moreover, based on the research of Schüle, Gabriel and Bolte (2017), they have found out that better health is connected with public green area. For instance, lower risk for coronary heart disease, mental health enhanced, physical activities increased and lower mortality. All in all, availability of public green space is an influential factor to maintain social and

environmental sustainability (Zhou and Rana, 2012; Mulliner, Smallbone and Maliene, 2013; Gan, et al., 2017).

2.3.8 Employment Opportunities Accessibility

Sustainability demands that housing needs to be designed nearer to work place (Winston, 2009). According to the research of (Tan, 2012a), it is undisputable that majority of the households preferred their houses to be located within 5 kilometres from their place of work. This is because longer distance from house to workplace will lead to additional travelling cost and time. Hence, easy accessibility to workplace is a crucial factor as it has an immediate effect on income of households. Moreover, poor accessibility to workplace can increase households' affordability to own a house. As a result, employment opportunities accessibility is fundamental criteria in creating a sustainable housing (Mulliner and Maliene, 2011).

2.3.9 Medical Care Services Accessibility

Based on the research, accessibility to medical care services is one of the important elements that will influence households' purchase decision (Chan and Adabre, 2019; Mulliner, Smallbone and Maliene, 2013). Poor accessibility to health care services is inconvenient for the households to consult a doctor and also could prevent households from getting health care services which their health can be worsened if their sickness is not treated immediately. Other than that, additional time and cost will be incurred due to longer travelling distance from their house to medical care service, and thus it cannot achieve sustainable housing requirement (Zeng, Rees and Xiang, 2019). With the intention of promoting a sustainable community, the medical care services accessibility is identified as a vital component (Mulliner and Maliene, 2011).

2.3.10 Education Services Accessibility

Sustainable housing demands good access to educational services (Isalou, Litman and Shahmoradi, 2014; Mulliner, Malys and Maliene, 2016; Lim, et al., 2018). Easy access to schools can affect an individual's future by increasing the chances for upward social mobility and enhancing their knowledge (Zeng, Rees and Xiang, 2019). This statement has been supported by Liu and Li (2018), who conducted a survey on determinants of housing purchase

decisions in Urban China, it is concluded that a lot of people in Chengdu cares about education for their next generation. Hence, easy access to education services is one of the significant attributes to them.

2.3.11 Leisure Facilities Accessibility

Based on the study of Schryer, et al. (2015), it has been proved that people will experience less depression and better vascular functioning when participating in leisure activities. Similarly, leisure participation also can act as an effective method to relieve stress. Moreover, social interaction and social cohesion will improve by contribution from leisure facilities.

Besides, household can spend their spare time in leisure facilities, such as swimming pools, libraries, museums and many others. By doing these activities not only can improve householders' quality of life, but also create a healthy lifestyle (Mulliner and Maliene, 2011). As a consequence, easy access to leisure facilities can be a contributing factor for sustainability which this statement is very aligned with the research of Mulliner, Malys and Maliene (2016) and Mulliner and Maliene (2011).

2.3.12 Shops Accessibility

Shops accessibility must be offered for communities to be sustainable (Lim, et al., 2018; Chan and Adabre, 2019; Tan, 2013; Soon and Tan, 2019). Poor access to shops will lead to high commuting costs due to longer travel distance, which has a direct impact on household income.

Based on a survey in China, more than 80 percent of the people who are staying in affordable housing had chosen shopping malls to buy household appliances, while the remaining people preferred supermarkets. Therefore, poor shops accessibility could prevent households from getting good quality daily food. This has proven "shops accessibility" is a crucial factor for sustainable housing affordability. On top of that, shops accessibility not only affected the quality of life of households, but also related to their survival chances (Zeng, Rees and Xiang, 2019). In addition, Mulliner and Maliene (2011) further declared that the attractiveness of a house location can be enhanced by the presence of shops.

2.3.13 Quality Performance of Housing

According to Yap, Yong and Skitmore (2019), quality performance of housing can be accomplished by fulfilling functional, aesthetic and legal requirement. Sustainable housing should be provided in high quality in terms of supply and technical level (Maliene and Malys, 2009). Housing quality performance is vital because it is one of the essential components for sustainability. However, there are several major concerns of housing features such as poor quality of finishes, lack of clean drinking water, inadequate insulation, poor quality of building materials and many others. These conditions will affect the quality of the house (Keall, et al., 2010). Consequently, it is notable to acknowledge quality of housing is equally essential to other sustainable housing factors (Maliene and Malys, 2009; Mulliner, Malys and Maliene, 2016).

2.3.14 Maintainability of Housing

By virtue of poor maintenance, a lot of public affordable housing projects have an inclination to poor living condition and deterioration (Tan, 2013). Under such circumstances, it will lead to shorter life spans and higher maintenance costs for the house, which is not “affordable” anymore since additional cost will be acquired (Wallbaum, et al., 2012). Also, affordable housing facilities with poor maintenance can increase mobility rate for high income household; meanwhile, for low income household that do not have the ability to afford other housing will be suffering under such situation. Additionally, income segregation within that neighbourhood would be aroused (Adabre, et al., 2020).

Adabre and Chan (2019) mentioned that there are a few forms of maintenance can be applied on housing. If it is just minor effect of failure, corrective maintenance can be implemented. Conversely, preventive maintenance could be carried out under conditions where repair is needed even though there is no any particular fault. Preventive maintenance can be condition-based or time-based. However, because of high maintenance cost, using condition-based is more ideal than using time-based for sustainable affordable housing. In short, house maintenance is required for sustainable affordable housing in order to provide a long lifespan for the house (Chan and Adabre, 2019).

2.3.15 Tenure Security

Homeownership makes households feel great in controlling over their own houses. Besides, owning a house gives out a great sense of personal accomplishment and security, and thus higher self-esteem. There are two types of tenure securities which are freehold and leasehold. In general, majority of households preferred freehold properties because freehold property wholly belongs to the homeowner. Also, fewer restrictions on land transaction and no specific timeline needed (Tan, 2012a). Nonetheless, some of the household would prefer leasehold property as it has a cheaper price which making high money value in investments. For instance, Hong Kong is currently using leasehold system to measure their land management to achieve sustainable development planning (Kong and Ho, 2006). All in all, tenure security is important as a factor for household to be considered when purchasing a house (Lim, et al., 2018; Gan, et al., 2017).

2.3.16 Crime Rate

The level of crime rate in a neighbourhood is a matter of serious concern which will affect sustainability of houses (Mulliner, Smallbone and Maliene, 2013; Mulliner, Malys and Maliene, 2016; Mulliner and Maliene, 2011). High level of crime rate will have a direct influence on affordability as households will feel worried outside and inside of their houses. Moreover, there is a need for households to spend additional costs on security for safety purpose if they are staying in a high crime level areas. Under such situation, houses should be built in a safe environment in order to promote housing sustainability (Mulliner and Maliene, 2011). Thanaraju, et al. (2019) have concluded that households are willing to pay extra for a safer neighbourhood. Also, residential gratification can also be achieved by having a safety community (Chan and Adabre, 2019).

2.3.17 Environmental Problems

Environmental problems, such as traffic congestion, air pollution and noise pollution are considered as one of the factors affecting sustainable housing (Mulliner, Smallbone and Maliene, 2013; Mulliner, Malys and Maliene, 2016). Due to the accessibility problem to public transport facility, households have

to rely on private vehicles which led to traffic congestion (Tan, 2013). Traffic congestion will cause inconvenience to households as additional time and costs can be incurred. On top of that, high usage of vehicles will cause air pollution as vehicles give out greenhouses gases which are harmful to human health (Mattingly and Morrissey, 2014). Some other common environmental concerns such as the presence of asbestos, radon and lead paint will also give a significant impact on households' health. Besides, loud traffic noise is also one of the environmental problems which bring negative effect on households, especially to those housing situated near to highway or street (Yap, Yong and Skitmore, 2019).

2.3.18 House Appearance

Housing appearance is one of the influential factors for sustainable housing affordability, and thus housing should be designed aesthetically to suit the needs of an individual (Chan and Adabre, 2019; Yap, Yong and Skitmore, 2019). According to Gan, et al. (2017), sustainability matters need to be taken into account for economic viability such as house design. Yap, Yong and Skitmore (2019) have stated that the first attribute will be noticed by households when buying a house is house appearance. Also, majority of the homebuyers in China preferred an attractive appearance of the house.

2.3.19 Energy Efficiency of Housing

One of the main elements of housing sustainability is energy efficiency (Pilkington, Roach and Perkins, 2011; Gan, et al., 2017; Mulliner, Smallbone and Maliene, 2013). According to Charoenkit and Kumar (2014), energy affordability is a core issue in majority of the developing countries, which households with low income are suffering from high cost of energy. High energy cost is mostly caused by energy inefficient of appliances and buildings. In addition, limiting the cost of operation for sustainable affordable housing project could be accomplished through energy efficient housing. For this reason, adopting energy efficiency appliances will be the best option to achieve sustainable housing affordability. By using energy efficiency in housing not only can provide economic benefits for the households, but also

can reduce the environmental problems, such as green house effect (Chan and Adabre, 2019).

Adabre, et al., (2020) mentioned that light emitting diode (LED) will be the most suitable replacement if compared to the other commonly used lighting systems. This is because it possesses a discrete appearance and is durable which can reduce energy consumption on lighting. Other than that, water heating cost can be saved up to 80 percent by replacing electric water heaters with thermal solar system along with giving protection for environment. Furthermore, insulation of the house can also be improved by applying insulating paint in order to enhance the house's thermal performance (Adabre, et al., 2020). On top of that, electricity consumption can also be cut down by using water-cooled instead of air-cooled conditioning system. An important principle for sustainable affordable housing is to provide minimum energy cost without affecting benefits and health of households (Chan and Adabre, 2019). Charoenkit and Kumar (2014) also further declared that households are able to pay lower energy cost with improved energy performance.

2.3.20 Safety Performance of Housing

A lot of low cost housing projects failed to design safety features in the building. In recent years, safety performance of housing has become an important concern for households (Chan and Adabre, 2019; Yap, Yong and Skitmore, 2019). In Malaysia, the occurrences of unsafe conditions in low cost housing that caused by poor quality and workmanship have been a serious issue in building safety performance. Other than that, problems of cracking walls, bulging walls, leaking pipes and inadequate foundation will have a significant impact on building safety performance (Husin, et al., 2011). Therefore, specific assessment for safety aspects in low cost housing must be established (Nizam, et al., 2012).

2.3.21 Summary of Influential Factors of Sustainable Housing Affordability

Summary of criteria of sustainable housing affordability will be drawn out in the summary table as shown below:

Note to Table 2.1:

Authors: 1 - Mulliner, Smallbone and Maliene, 2013; 2 - Mulliner, Malys and Maliene, 2016; 3 - Chan and Adabre, 2019; 4 - Saidu and Yeom, 2020; 5 - Stone, 2006; 6 - Soon and Tan, 2019; 7 – Bujang, et al., 2017; 8 - Mulliner and Maliene, 2011; 9 - Adabre and Chan, 2018; 10 - Isalou, Litman and Shahmoradi, 2014; 11 - Adabre et al., 2020; 12 – Said, et al., 2014; 13 - Liu and Li, 2018; 14 - Ng, 2019; 15 - Sabri, Ludin and Johar, 2013; 16 - Yap, Yong and Skitmore, 2019; 17 - Tan, 2013; 18 – Gan, et al., 2017; 19 - Zhou and Rana, 2012; 20 - Winston, 2009; 21 - Tan, 2012a; 22 – Lim, et al., 2018; 23 - Maliene and Malys, 2009; 24 - Pilkington, Roach and Perkins, 2011.

2.4 Relationship between Demographic Factors and Housing Preferences

2.4.1 Housing Preferences based on Income Groups

Income cohorts is one of the demographic factors which can influence on housing preferences (Cheuk and Ping, 2012; Soon and Tan, 2019; Opoku and Abdul-muhmin, 2010). According to Department of Statistics Malaysia (2020), the mean income of Malaysians in 2019 was RM7,901 which has increased 4.2 percent. Simultaneously, median income in Malaysia was 6.6 percent in 2016 and has risen 3.9 percent per year in 2019. Furthermore, income groups in Malaysia have been classified into 3 groups which are B40, M40 and T20. B40 group represents low income households with income less than RM4,849 while household income between RM4,850 to RM 10,960 will be classified as middle income group, namely M40. With income more than RM10,960, they will be grouped as T20.

Bujang, Zarin and Jumadi (2010) stated that household with lower income mostly will purchase a low cost house, whereas high income household might purchase a higher cost property. Based on a study in Guangzhou, low income group preferred to stay near to public transport as bus is one of their main transport systems. Therefore, households with low income are reluctant to stay in newly developed regions due to poor accessibility to public transport, shops, workplace and others as this will lead to living inconvenience. However, households with middle or high income are more willing to stay in poor accessibility areas since they can afford their own private car (Wang and Li, 2006).

On the contrary, a Korean researcher has stated that high income households, in comparison with the middle and low income households were more likely to be influenced by accessibility issues. This has indicated that households with higher income in Korea preferred to stay in areas with good accessibility. Moreover, availability of green public spaces is also an important preference for higher income households in Korea (Jun, 2013b). In Sweden, a study has shown that high income households are more concerned about work opportunities accessibility and less likely to focus on education facilities, housing prices and leisure facilities. Some of the researchers argued that high income group are more attracted to leisure facilities compared to middle and

lower income group. However, it was an unexpected result which has shown that leisure facilities are more important to households with lower income in Sweden (Niedomysl, 2008).

According to a study of Opoku and Abdul-muhmin (2010) in Saudi Arabia, low income households have chosen to purchase their own house instead of renting a house. This is because owning a house can give a great sense of accomplishment and social identity which is very important to the Saudi Arabians. Other than tenure security, low income group of Saudi population also viewed that housing appearance is vital for housing preferences. Generally, the weather in Saudi Arabia is mostly hot or dry. With this reason, low income segment of Saudi population are less likely to be affected by the availability of public green space. In Turkish study, Berko and Dokmeci (2000) mentioned that environmental problems is an essential issue for all income groups in Istanbul as they preferred to stay in a clean neighbourhood.

2.4.2 Housing Preferences based Generation Cohorts

Difference age group will have different housing preferences (Liu and Li, 2018; Kam, et al., 2018; Bujang, Zarin and Jumadi, 2010; Berko and Dokmeci, 2000). According to Tung and Comeau (2014), there are four generation cohort groups which are Baby boomers (60-77 years old), Generation X (39-59 years old), Generation Y (18-38 years old) and Generation Z (0-15 years old).

Based on a research of Generation Y in Malaysia, Kam et al. (2018) claimed that availability of public green spaces and energy efficiency of housing are greatly important for younger age group. Generation Y is willing to spend more on green products as they are aware of green practices. Other than that, another preferable housing preference for Generation Y is good accessibility to public transport facilities, leisure facilities, employment opportunities and shops. This is because good accessibility can lead to reduction in transportation costs and time. Furthermore, the analysis also indicated that Generation Y is more likely to stay in a place without environmental problems such as air pollution, noise pollution or dirty living

environment. Also, Generation Y also shows greater concern for crime rate around neighbourhood as they would prefer to stay in safer places.

In a Turkish study, Berko and Dokmeci (2000) mentioned that housing preference can be affected by different age groups. For the middle age group, employment opportunities accessibility, clean living environment and leisure facilities accessibility are important for their housing preference. Also, middle age group viewed that aesthetic aspect of housing is essential, in comparison with younger age and older age group. Meanwhile, living in a clean environment is the most important housing preference for the older age group, followed by leisure facilities accessibility and job opportunities accessibility. Apart from that, they also concerned more about the availability of green public areas compared to younger and middle age group. This may owe to the fact that retired seniors have more free time to access green public spaces.

Furthermore, a research in China shows that older age group has a greater care about safety, which means they would prefer to live in a safer environment with lower crime rate. Conversely, younger age group is more likely to stay close to leisure facilities (Wang and Li, 2006). However, it was surprised that there is an opposite result from Swedish. Older people in Sweden tend to live close to leisure facilities, whereas younger people concern about proximity to education facilities and working opportunities (Niedomysl, 2008). It is also interesting to see that housing preference will change as people grew older. For instance, older age group would less emphasis on job opportunities and concern more in good living surroundings, good accessibility to medical care and leisure facilities.

2.4.3 Housing Preferences based on Gender

Gender will be taken into consideration as a demographic factor when buying a house (Liu and Li, 2018; Soon and Tan, 2019). Gender refers to one's own identity as male or female. According to a Swedish research, it reveals that females tend to stay closer to leisure facilities (Niedomysl, 2008). On the other side, there is a noticeable difference that housing appearance is more significant to females than male in Saudi Arabia. Because of cultural and religious issue, females seemed to be more attracted to aesthetic aspect of housing than males (Opoku and Abdul-muhmin, 2010).

Apart from that, female and male respondents from China are equally viewed that smooth traffic flow is a very important factor for housing preference. However, male respondents seemed to be more concern for safety. This might be due to the Chinese culture as males have the responsibility to protect other family members in a household. With this reason, it can explain why there is more male respondents chose safety over female respondents. Next, there are more females responded that proximity to job opportunities is important as compared to males. Furthermore, female respondents are also more likely to stay in an area with good accessibility to health care and education facilities (Wu, 2010).

2.4.4 Housing Preferences based on Marital Status

Housing preference is subjected to influencing demographic factors such as marital status (Kam, et al., 2018; Thanaraju, et al., 2019). Marital status can be classified as single, married and divorced.

Zheng, Fu and Liu (2006) stated that housing preference for married households is proximity to city centre as they are more focused on their career. Therefore, accessibility to workplace is an important preference for married households than unmarried households in Chinese cities. Nevertheless, there is an opposite result in Malaysia which is there are more unmarried households, in comparison with married households, tend to have the preference to stay near to workplace. For married households, they have chosen education facilities as their housing preference. This is because living near to school is convenience for married households in fetching their children (Soon and Tan, 2019). However, Thanaraju, et al. (2019) discovered a different result of housing preference for married households in Malaysia, which stated that married households tend to prefer living close to workplace. Besides, Tan (2012) also mentioned that homeownership is more important for married households than single household. Similarly to findings in a China study, it was found that housing preferences can be affected by marital status (Ma and Chow, 2016).

2.4.5 Housing Preferences based on Education Level

There is a significant relationship between housing preference with education level of an individual (Liu and Li, 2018; Ma and Chow, 2016). According to Liu and Li (2018), education level have an effect on housing preference as the higher the level of education of an individual, the higher the chance to buy a property. On top of that, the study shows that higher education cohort in Chengdu tend to care more about the accessibility to education facilities. This is because they pay a great focus on education for future generation. Also, another research in Southern China has highlighted that higher education households are less likely to concern the price of housing, majority of them preferred to stay in a property with low to medium cost. In contrary, households with lower education level are more likely to purchase good quality and higher price properties and with good accessibility to public transport systems (Ma and Chow, 2016).

Similarly, higher educated households in Sweden are less concerned about housing cost and medical care facilities. Conversely, they care more about job opportunities and education services compared to less educated households (Niedomysl, 2008), this research result was similar to higher educated household in Guangzhou (Wu, 2010). Besides, higher educated households in Sweden are also more emphasis on leisure facilities, while compared to less educated households (Niedomysl, 2008). In Guangzhou, all levels of education group viewed that proximity to job place, accessibility and safe living environment are important for their housing preference (Wu, 2010).

2.4.6 Housing Preferences based on Employment Status

It is undeniable that housing preferences can be affected by employment status (Wang and Li, 2006; Ma and Chow, 2016). Occupational status can be categorized into employed, unemployed, housewives, students and retired. For employed category, they are more emphasis on the proximity to work place than other groups. However, since self-employed respondents do not have fixed income; therefore, they have the least emphasis on employment opportunities as they can always take their workplace with them anywhere. Furthermore, unemployed respondents are less likely concern in staying near to work opportunities if compared with employed respondents.

Based on a Swedish study, leisure facilities accessibility is an important preference to the unemployed when purchasing the property. However, unemployed respondents are much more preferred to live close to education facilities than the employed respondents. This might be due to the unemployed respondents viewed that having higher education can reduce the chance to be unemployed. Apart from that, students, in comparison with other groups, are more concern for work opportunities and leisure facilities (Niedomysl, 2008). On the other hand, retired respondents tend to prefer staying near to leisure facilities, medical care services and shops. For instance, library, bank, grocery stores and pharmacy (Ma and Chow, 2016).

2.4.7 Housing Preferences based on Presence of Children

Presence of children is significantly correlated with housing preferences of households (Zheng, Fu and Liu, 2006; Wu, 2010; Opoku and Abdul-muhmin, 2010). Kam, et al. (2018) indicated that the presence of green public spaces is very crucial to households with children as green public spaces not only can provide outdoor activities but also can improve cognitive development of children. Also, with presence of children in a house, households chose to stay closer to education facilities when buying property (Thanaraju, et al., 2019; Soon and Tan, 2019). Likewise for families with children in Sweden, they are also more emphasis on education facilities (Niedomysl, 2008). However, quality of housing will be taken into consideration for households with children in Istanbul (Berko and Dokmeci, 2000).

Based on the study of Kim, Horner and Marans (2005), the availability of public green spaces close to housing is essential for households with children. This is because natural environment can help to improve children's development and health. With this reason, households with children are less likely to pay attention for accessibility to workplace. Therefore, they are willing to move further away from city centres to an area with less pollutions and lower crime rate. Moreover, families with children also preferred to stay near to health care services and a safe environment with low crime rate. On the other hand, households without children have a preference for easy access to workplace and leisure facilities as low transportation cost and convenience are their priorities.

2.4.8 Summary of the Relationship between Demographic Factors and Housing Preferences

The following Table 2.2 will draw out the summary of the relationship between demographic factors and housing preferences.

Note to Table 2.2:

Authors: 1 - Cheuk and Ping, 2012; 2 - Soon and Tan, 2019; 3 - Opoku and Abdul-muhmin, 2010; 4 - Bujang, Zarin and Jumadi, 2010; 5 - Wang and Li, 2006; 6 - Jun, 2013b; 7 - Niedomysl, 2008; 8 - Liu and Li, 2018; 9 - Berko and Dokmeci, 2000; 10 – Kam, et al., 2018; 11 - Wu, 2010; 12 – Thanaraju, et al., 2019; 13 - Ma and Chow, 2016; 14 - Zheng, Fu and Liu, 2006; 15 - Niedomysl, 2008; 16 - Kim, Horner and Marans, 2005.

Table 2.3: Summary of Housing Preferences based on Demographic Factors

Ref	Housing Preferences	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
1	Housing Preferences based on Presence of Children		x	x						x	x	x	x		x		x	8
2	Housing Preferences based on Income Groups	x	x	x	x	x	x	x										7
3	Housing Preferences based on Generation Cohorts				x	x			x	x	x							5
4	Housing Preferences based on Marital Status										x		x	x	x			4
5	Housing Preference based on Education Level								x			x		x		x		4
6	Housing Preferences based on Gender		x	x				x				x						4
7	Housing Preferences based on Employment Status					x								x		x		3

2.5 Strategic Measures to reduce the Affordable Housing Gap in Malaysia

2.5.1 Centralise Initiatives of Affordable Housing

According to a study of Bank Negara Malaysia, provision of affordable housing is incoherent and lack of coordination. Because of fragmentation of various institutions involved in the affordable housing provision, they are not connected with each other which have led to slow progress towards accomplishing target given by the Government.

There are more than twenty agencies from the national and state-level involving in affordable housing provision projects, such as Lembaga Tabung Angkatan Tentera (LTAT), Perumahan Rakyat 1Malaysia (PR1MA), Lembaga Kemajuan Tanah Persekutuan (FELDA) and many others. One of the strategies to solve this issue is to assure the Government and the state agencies can share the information (Ebekoziem, Abdul-Aziz and Jaafar, 2020a). Therefore, combination of the agencies not only can enhance the efficiency and effectiveness in planning and execution, but also can speed up construction works and mitigate development expenses by reason of economies of scale. In order to achieve consolidation, affordable housing initiatives are then integrate development in funding, planning and construction at the federal level. The central entity can detect locations, economic status and shortage of affordable housing by using the integrated database. Consequently, supply for affordable housing can be planned effectively across the country. Furthermore, state authorities will become partners of the entity after the consolidation is successful. For instance, countries like Singapore and South Korea are the ideal examples for doing a great job in creating a single entity in order to bridge the affordable housing gap (Cheah, Almeida and Ho, 2017).

2.5.2 Mitigate Rejection of Housing Loans from Bank

In Malaysia, a large number of low income earners (LIE) are facing difficulties in applying housing loans and providing down payment. Pursuant to a study in Malaysia, there are more than 70 percent of homebuyers get rejected of their housing loan from the bank even though they have been certified as eligible house buyers (Ebekoziem, Abdul-Aziz and Jaafar, 2020a).

Ebekozien, Abdul-Aziz and Jaafar (2019a) have identified few causes for refusal of housing loan application. The top three reasons are insufficient income of applicants, lack of creditworthiness and bad reputation in Central Credit Reference Information System (CCRIS). On the other hand, Bakh et al. (2013) further mentioned that the failure for applying housing loan is due to low salaries of applicants, unemployed and poverty problems. Also, Yap and Ng (2018) stated that a lot of first time homebuyer have been restricted from buying a house due to strict lending rules. One of the possible strategies is to reduce reluctance by bank for housing loan application (Ebekozien, Abdul-Aziz and Jaafar, 2020a, 2019a; Yap and Ng, 2018).

According to Yap and Ng (2018); Alaghbari, et al. (2011), mitigate restriction of housing loan application by bank can be a solution to reduce affordable housing gap. Therefore, bank need to revise and pay attention to loan applicants for their mortgage lending requirement. Other than that, housing loan scheme, down payment and rent-to-own scheme should be set up and easier for low income earners to apply, which can truly protect and help homebuyers. Besides, the government and bank should provide subsidies for low income earners who cannot afford to provide down payment and Bank Negara Malaysia should monitor in such situations (Ebekozien, Abdul-Aziz and Jaafar, 2019a).

2.5.3 Determine Eligibility of Homebuyers

The proof of ineligible individuals using immoral means to purchase low cost housing have led to a demand-supply gap for affordable housing (Ebekozien, Abdul-Aziz and Jaafar, 2020a). In order to bridge the gap, a functional computerized Open Registration System (ORS) should be deployed (Ebekozien, Abdul-Aziz and Jaafar, 2020b, 2018b, 2020a, 2019b; Development and Platform, 2019). The Open Registration System has been implemented as a tool to determine eligible applicants through registration in 1997 (Sufian and Ibrahim, 2011); however, it is not clear and transparent enough to determine eligibility of applicants. Under such circumstances, a complete functional computerized Open Registration System and a yearly system update should be implemented.

Besides, the information of the registries should be evaluated, verified and updated consistently as a completed ORS in order to prioritise creditworthy applicants (Ebekozién, Abdul-Aziz and Jaafar, 2018b). Nevertheless, Ebekozién, Abdul-Aziz and Jaafar (2019b) found out that there are only two states in Malaysia owned a complete functional ORS, whilst others still carrying out paperwork or having incomplete systems. Hence, ORS in Malaysia should be improved to avoid ineligible persons to purchase affordable housing. Apart from that, Ebekozién, Abdul-Aziz and Jaafar (2020) also suggested that state governments should adopt the Central Credit Reference Information System (CCRIS) for applicants to go through their verification of earnings. It is a centralised system to integrate capable applicants' credit information, such as applicants' monthly income, bankruptcy status and others. Moreover, Ebekozién, et al. (2020) also mentioned that double checking the eligible applicant list is important for housing developers to make sure that there are no any ineligible persons.

2.5.4 Reduce the Construction Cost for Affordable Housing

Expensive construction costs have become one of the biggest obstacles for affordable housing provision. According to the Housing Developer Association Malaysia, price for land, workers, building materials and compliance can reach up to 80 percent of house costs. Furthermore, by adopting labour-intensive traditional construction methods will lead to poor productivity. Consequently, expensive construction costs and longer duration of project will be incurred. Although Malaysia is using advanced technologically construction methods, the level of productivity is still low. This may owe to the fact that the majority of the labourers are low or semi-skilled workers which do not have the knowledge of the construction methods. Besides, around urban centres have the most in demand; however the house price in these locations is unaffordable due to high land costs (Cheah, Almeida and Ho, 2017).

In order to achieve an affordable level, it is crucial to decrease the housing price by reducing the construction cost (Cheah, Almeida and Ho, 2017; Ebekozién, Abdul-Aziz and Jaafar, 2020a; Development and Platform, 2019). According to Bank Negara Malaysia, there are three ways to reduce the

affordable housing price which are using more advanced construction methods, combining resources from agencies and ministries to create a single entity and mitigating compliance cost. For instance, Industrialised Building System (IBS) can be adopted in order to improve efficiency of the construction works, which can lead to lower construction cost, lesser wastage and shorter delivery period. Singapore is the ideal example for adopting IBS which has helped in reducing overall project costs and also managed to save more 45 percent in labour cost. Moreover, the spending power to engage better procurement methods can be enhanced through the single entity. Thus, lower construction costs will be incurred due to bulk orders of building materials. Apart from that, compliance cost of affordable housing projects can be reduced by speeding up the process for approval, reducing the fees for application and providing density bonus (Cheah, Almeida and Ho, 2017).

On the other side, Ebekoziem, Abdul-Aziz and Jaafar (2020a) mentioned that one of the possible strategies to solve high construction costs will be waiving all types of tax on affordable housing and the government can subsidise lands to developers for engaging in development of affordable housing. Based on a study in the US, it has stated that building materials can be replaced with cheaper alternative construction materials. By using this method, construction costs can be reduced. In addition, developers need to collaborate with educational institutions to boost skills development (Development and Platform, 2019).

2.5.5 Implementation of Cumulative Ruling Policy

In order to reduce affordable housing gap, the government needs to initiate the implementation of cumulative ruling policy for the developers to develop affordable housing (Ebekoziem, Abdul-Aziz and Jaafar, 2018a, 2020b, 2018b, 2020a).

In general, cumulative ruling is a policy used to define that developers need to construct affordable housing based on an agreed threshold, but not based upon a project. In other words, housing developers are mandated to build low cost housing once the target is reached without taking into account the number of projects (Ebekoziem, Abdul-Aziz and Jaafar, 2020a). According to a research of Ebekoziem, Abdul-Aziz and Jaafar (2020b), it is expected that

there will be disagreement from some of the housing developers for the execution of cumulative ruling policy as nobody will not want to construct low cost housing. However, the cumulative ruling is considered as one of the methods to avoid cunning developers for project splitting (Ebekoziem, Abdul-Aziz and Jaafar, 2018a).

2.5.6 Financial Incentive for Construction of Affordable Housing

In order to encourage the development for affordable housing projects, financial incentives provided by the government is one of the potential strategies (Yap and Ng, 2018; Ebekoziem, Abdul-Aziz and Jaafar, 2020a; Development and Platform, 2019; Olanrewaju and Idrus, 2020; Sufian and Ibrahim, 2011). Yap and Ng (2018) suggested that the government should lessen the utilities contributions and provide tax incentives to housing developers as incentives can act as an encouragement for them to construct affordable housing projects. Similarly, a research in the US has the same concept, which is that the government should offer tax exemptions and incentives to housing developers (Development and Platform, 2019). The tax incentive allows investors to gain commercial return through lower rents since tax incentives could decrease the net price of housing (Holmans, Whitehead and Scanlon, 2010).

Besides, provision of cheap and long-term finance of government-guaranteed bond to community organisations is very important in development of affordable housing (Development and Platform, 2019). Olanrewaju and Idrus (2020) also further mentioned that the possible solution to reduce affordable housing gap is that the government needs to give tax reliefs and subsidies to contractors, housing developers and house buyers. Moreover, the regulation of the Employee Prudential Fund (EPF) should be less strict in order to allow applicants to use some of the savings to provide down payment. Other than that, in other countries like Needham, India and Ram, they are using fee waiver and Value-Added Tax (VAT) exemption to cut down the costs of utilities and construction, so that the supply of affordable housing can be increased (Yap and Ng, 2018). Meanwhile in China, the government supported the program of affordable housing by waiving 50% of taxes and 100% of administrative fees since 1994 (Niu, 2008).

2.5.7 Implementation of Joint Task Force

Implementation of a joint task force is one of the potential solutions to reduce the affordable housing gap (Ebekoziem, Abdul-Aziz and Jaafar, 2018b, 2020a, 2018a). Joint task force is the collaboration between state government housing departments, planning office and land office with the instruction to assure housing developers will enforce low cost housing compliance (Ebekoziem, Abdul-Aziz and Jaafar, 2020a). Apart from that, establishing a joint task force is a method to prevent developers from taking advantage of state policy, which aims to assure and monitor compliance of affordable housing. Also, states should report back to the executive regularly (Ebekoziem, Abdul-Aziz and Jaafar, 2018b).

2.5.8 Enhance Financial Literacy of Homebuyers

One of the potential strategies to mitigate affordable housing gap is to improve financial literacy of homebuyers (Cheah, Almeida and Ho, 2017; Development and Platform, 2019). Development and Platform (2019) also stated that poor financial literacy will cause housing bubbles.

According to Bank Negara Malaysia, deciding to buy a house will be one of the greatest financial decisions for homebuyers. Nevertheless, there is a study revealed that most of the people in Malaysia are having low financial literacy. This is because of the evidence of more than 75% of households in Malaysia cannot bring up RM1, 000 for the needs of emergency. This has proved that the level of financial literacy for Malaysians is very low, and thus the importance of finance literacy cannot be overlooked. In this case, Bank Negara Malaysia has decided to improve the financial literacy by providing financial education via the Credit Counselling and Debt Management Agency (AKPK). For instance, AKPK has offered an online learning platform, named as "POWER!". This online learning programme is to provide guidance and advises for homebuyers on renting or purchasing a house. Apart from that, there is a Housing Loan calculator provided by AKPK for homebuyers to calculate for their loan amount (Cheah, Almeida and Ho, 2017). Moreover, Development and Platform (2019) further suggested that non-private sector can offer financial education to borrowers in order to enhance their financial literacy and also can offer help in their expenses planning.

2.5.9 Provide Housing Schemes

Another method to bridge the gap of affordable housing is to provide housing schemes (Yap and Ng, 2018; Development and Platform, 2019; Samad, et al., 2016; Tan, 2013). Tan (2013) stated the Malaysian government had come up with different kinds of public housing schemes to make houses more affordable.

One of the affordable housing schemes is “My First Home Scheme (MFH)” which is to help young people to purchase their first housing property with a full financing if their monthly income is below RM5, 000 (Yap and Ng, 2018). Other than that, the government also has launched 1 Malaysia People’s Housing Scheme (PR1MA) which targeted low and middle income households to purchase a house that costs between RM100,000 and RM400,000 in Malaysia. Other than these two housing schemes, there are other schemes such as Home Ownership Campaign (Samad, et al., 2016). Last but not least, Yap and Ng (2018) suggested that the government should launch more affordable housing schemes in order to meet the demand and can encourage developer to build more affordable housing.

2.5.10 Enhance Rental Market to Rehabilitate Housing Balance Sheet

Enhancing rental market can help in bridging the affordable housing gap (Samad, et al., 2016; Development and Platform, 2019; Sard and Waller, 2002; Cheah, Almeida and Ho, 2017). This is because boosting rental housings can mitigate the short run problem since household income will be increased and their balance sheets will be rehabilitated. However, households in Malaysia are more likely to purchase a house rather than renting a house due to poor and slow dispute solution process of tenant-landlord and poor legal safeguards. Therefore, Residential Tenancy Act was announced to offer legal safeguards for landlord that can boost up the demand and supply of rental housing. Subsequently, solution for dispute of tenant-landlord is to implement Tenancy Tribunal (Cheah, Almeida and Ho, 2017).

In addition, Sard and Waller (2002) further stated that funds provided by the government are essential to stimulate more rental housing projects located in the areas which have the least availability of affordable housing. Hence, households who have difficulties in financial can choose to rent a

house instead of buying, which can alleviate their financial burden and also keep their homes affordable at the same time. There are a few of benefits for rental housing, such as low operation and maintenance cost, low capital required and lesser citizenship requirement (Development and Platform, 2019).

2.5.11 Summary of Strategic Measures to Reduce the Affordable Housing Gap in Malaysia

Summary of recommendation to mitigate the affordable housing gap in Malaysia is listed in the table below:

Note to Table 2.3:

Authors: 1- Cheah, Almeida and Ho, 2017; 2 - Ebekoziien, Abdul-Aziz and Jaafar, 2020a; 3 -Ebekoziien, Abdul-Aziz and Jaafar, 2020b; 4 - Ebekoziien, Abdul-Aziz and Jaafar, 2019a; 5 - Ebekoziien, Abdul-Aziz and Jaafar, 2019b; 6 - Ebekoziien, Abdul-Aziz and Jaafar, 2018a; 7 - Ebekoziien, Abdul-Aziz and Jaafar, 2018b; 8 – Alaghbari, et al., 2011; 9 - Yap and Ng, 2018; 10 - Development and Platform, 2019; 11 - Olanrewaju and Idrus, 2020; 12 - Sufian and Ibrahim, 2011; 13 – Samad, et al., 2016; 14 - Tan, 2013; 15 - Sard and Waller, 2002.

Table 2.4: Summary of Strategic Measures to Reduce the Affordable Housing Gap

Ref	Strategic Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1	Determine Eligibility of Homebuyers		x	x		x	x				x						5
2	Financial Incentive for Construction of Affordable Housing		x							x	x	x	x				5
3	Mitigate Rejection of Housing Loans from Bank		x		x				x	x							4
4	Implementation of Cumulative Ruling Policy		x	x			x	x									4
5	Provide Housing Schemes									x	x			x	x		4
6	Enhance Rental Market to Rehabilitate Housing Balance	x									x			x		x	4
7	Implementation of Joint Task Force		x				x	x									3
8	Centralise Initiatives of Affordable Housing	x	x														2
9	Reduce the Construction Cost for Affordable Housing	x	x														2
10	Enhance Financial Literacy of Homebuyers	x									x						2

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

What is research? Research can be defined as a careful detailed study or systematic search for useful and suitable information on a given topic. Research is important as it is one of the sources of knowledge and can provide direction for problem-solving through analysis and objectives (Rajasekar, Philominathan and Chinnathambi, 2013).

This chapter reveals the implementation of research methodology that will be used in this study. In order to provide a better understanding, this chapter will also describe the definition of research methodology and quantitative research. Subsequently, sampling design, method for data collection and data analysis will also be discussed in this chapter. Lastly, a summary will be drawn at the end of this chapter.

3.2 Research Methodology

Research methodology is a systematic technique for problem-solving, which means a detailed study on how research is carried out (Kothari, 2004). In general, for the aim of decision making, the procedures used to receive data and information is known as research methodology. On top of that, it also can be described as an understanding of the research by which the knowledge is obtained. Therefore, researchers are required to design a methodology which is suitable for their selected problems (Rajasekar, Philominathan and Chinnathambi, 2013).

Basically, the research methods can be classified into two main research which are qualitative research and quantitative research. In some cases, both qualitative and quantitative approaches can be used at the same time, namely mixed method. Qualitative method is non-numerical but involved language, behaviour observation, thoughts, experiences, feelings and beliefs (Ebekozen, Abdul-Aziz and Jaafar, 2019a). However, quantitative method is based on numbers, statistics and measurement to gather data for the selected topic (Zainon, et al., 2017). In this research, quantitative method was

adopted to get the statistical data from respondents within Klang Valley area regarding to their perceptions for the topic of sustainable housing affordability.

3.2.1 Quantitative Research

Quantitative research is a research method that consists of statistical or empirical studies (Newman and Ridenour, 1998). According to Zainon et al. (2017), quantitative research is depend on the measurement of quantity and statistical techniques. Furthermore, Soon and Tan (2019) also indicated that this research method is broadly used to measure the data in numerical and statistic form. As such, questionnaires a will be the method for data collection.

In order to gain reliable outcome, a large sample size is required in this method. After receiving all the data from the respondents, Statistical Package for the Social Science (SPSS) will be used to analyse the data and subsequently the result will commonly presented in graph or table. Additionally, complex mathematical formulae which are known as statistical method will also be adopted in this quantitative research (Kothari, 2004). Quantitative methodologies allow the researchers to isolate and determine certain variables to observe differences in the results (Newman and Ridenour, 1998).

3.3 Sampling Design

According to Kothari (2004), sample design is usually identified before the process of data collection. It can be defined as a specific plan or technique which allows researchers to obtain the sample for the relevant research topic from a particular population.

As a good researcher, the obligation to provide an appropriate and reliable sampling design is essential to carry out the research. This is because a poor sampling design will lead to consequences such as sampling errors which will mislead the results. On top of that, the availability of funds also has to be taken into consideration when designing the sample. During the stage of the development of sampling design, the researchers need to consider sample size, sample frames and sample methods.

3.3.1 Sampling Frames

Sampling frame is one of the important criteria to be considered in generating a good sampling design. Sampling frame can be described as a list of all actual cases drawn from the selected population, which will be the representative of the population (Taherdoost, 2016b). An appropriate sampling frame is required in the research as inappropriate sampling frame might lead to biased representation. As a consequence, systematic biased will be incurred in the research study (Kothari, 2004).

In this research, individuals staying within the Klang Valley area will be the sampling frame. This may be due to the fact that most of the Malaysians would prefer to migrate to the Klang Valley area as it is the most developed city in Malaysia. Moreover, Klang Valley is considered the center of economic activities with various demographic groups, in which higher living standards and better working opportunities are available in these areas (Soon and Tan, 2019). Therefore, Klang Valley is the ideal area to study housing affordability and preferences. On the other hand, only individual with aged 18 and above was allowed to participate in this questionnaire as 18 years old is the minimum age to purchase a property in Malaysia. Additionally, it is also assumed that younger individual would normally face ambiguity of the questions and therefore resulting in less reliable responses (Fuchs, 2005).

3.3.2 Sampling Size

Kothari (2004) indicated that the size of sample is an important element to constitute a sample. Also, it must be determined precisely before collecting the data. In terms of size, the sample needs to be in adequate size in order to prevent sampling bias. Additionally, an ideal sample is able to achieve the requirement of reliability, representativeness, accuracy and efficiency. Apart from that, the limitation of budget must be considered when planning the size of the sample (Taherdoost, 2016b). It is necessary to take a large number of sample sizes in order to acquire reliable statistical results. As such, the ideal sampling size should be at least 100 respondents (Kothari, 2004). In this research, the targeted number of respondents was 100 to 150 respondents with minimum 30 respondents for each discipline.

3.3.3 Sampling Methods

Certain types of samples are chosen by researchers prior to research, therefore it is important to understand which types of sampling methods are available and its various definitions. The method of sampling refers to selecting from a subset which may include a specific demographic or chosen category in order to procure data about the sample, thereby relating back to the theory that the researcher has chosen to formulate. There are two types of sampling techniques available, namely non-probability sampling and probability sampling.

In probability sampling, a specific population or category is chosen. Thereafter, every member of said population has an equal probability of being a part of the sample regardless (Kothari, 2004). A method commonly used in probability sampling is by compiling a sampling frame and using a computerised number program to select the population. Although proving to be the most unbiased method of sampling, probability sampling is both more time consuming and costly for the researchers. Meanwhile, non-probability sampling is commonly found in research that involves qualitative values and investigating case studies related to research design. Hence, sample sizes are smaller and researchers who are using the non-probability sampling method are more focused on understanding real life impacts on their samples rather than formulating numerical data for their research purposes.

For the non-probability sampling method, samples do not need to represent their population as a whole or be randomly chosen for the research, rather researches focus on clarity and detailed analysis on their samples (Taherdoost, 2016b). Figure 3.1 presented the sampling techniques for probability sampling and non probability sampling. In this research study, convenience sampling will be adopted. Typically, convenience sampling technique is an easy option which is most favoured by student researchers since it is inexpensive as compared to other sampling methods. Moreover, data collection for this method is much easier and accessible (Taherdoost, 2016b).

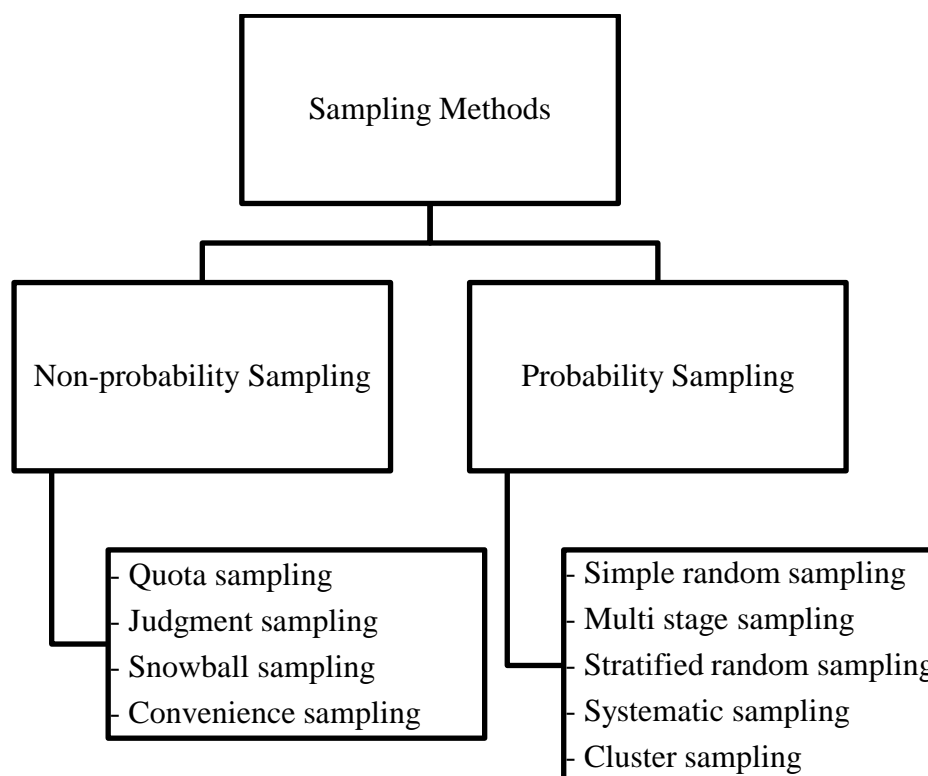


Figure 3.1: Sampling methods (Taherdoost, 2016b).

3.4 Data Collection Method

The step of data collection will be implemented once the frames, methods and size of sampling have been set up. It can be described as a procedure of assessing and gathering information such as facts, statistic and others based on the variables of interest. Other than that, data collection allows individual to answer the questions which were set up by the researcher. Subsequently, the result will be analysed (Taherdoost, 2016b).

Based on the research of Kothari (2004), there are two types of data which are primary and secondary. Primary data is first hand data, which is directly collected from the respondent without any evaluation and analysis. Accordingly, primary data are more bona fide, reliable and unbiased. On the other hand, the secondary data refers to the data has been collected, analysed and evaluated by someone else. In other words, the data which has gone through statistical process by the researchers is known as secondary data. Hence, the researchers have to be careful when using secondary data as they might be unsuitable or inadequate of the chosen topic (Sapsford and Jupp,

2006). In this research study, both primary and secondary data will be adopted to generate findings that are relevant to the research topic.

3.4.1 Quantitative Research: Questionnaire

Since this research study will be using quantitative method, questionnaire approach will be the ideal method to conduct this research. Sapsford and Jupp (2006) mentioned that questionnaire is one of the methods that is frequently used in the survey, which consists of a list of questions to be answered by selected respondents. Generally, the questions will be structured into either close-ended or open-ended and can be carried out through mail, fax, face-to-face or any other methods (Kothari, 2004).

Apart from that, Taherdoost (2016) indicated that data that are collected from the respondents through questionnaire are normally in numerical and can be evaluated through statistical process. By adopting detailed administration, testing and considerate design for a survey questionnaire, an accurate and reliable data can be generated. Additionally, the researchers need to pay attention to two issues if they want to get accurate data. The first issue will be the questions of the questionnaire need to be set appropriately, whilst second issue will be the targeted population. It is important to target the suitable population in providing answers for the questionnaire in order to generate reliable and accurate information. This is due to wrong selected sample will not only cause higher possibility in failure to answer, but also will lead to biased outcome (Sapsford and Jupp, 2006).

For the purpose of constituting an appropriate questionnaire, complex questions are not recommended and it is better to be straightforward and clear. Moreover, there must be a contradictory between rating scales and multiple choice questions. In addition, questions that are irritate, sensitive or double-barrelled must be avoided in the questionnaires. Last but not least, instructions that provided to respondent to answer the questionnaire must be precise, clear and unambiguous (Taherdoost, 2016a). As a whole, a well organized questionnaire is very crucial in a research study.

3.4.2 Questionnaire Design

A quantitative manner is conducted in this research study. In light of this, survey questionnaires were prepared to act as an instrument for data collection. The questionnaire consists of four sections. The first section, Section A, required respondents to fill in their general background information such as gender, age group, education level, employment status, monthly income range, marital status and presence of children. The purpose of Section A is to indicate whether there is any significance difference between different respondent groups. Furthermore, respondents were requested to rate their importance of factors affecting sustainable housing affordability in Section B. Concurrently, Section C and Section D consists of questions about housing preferences and strategic measures to reduce affordable housing gaps respectively. In terms of questionnaire design technique, 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) was adopted as a rating scale in Section B, C and D to identify feedback from the respondents.

3.4.3 Pilot Test

A pilot test is suggested to be conducted as a trial before commencement of the main survey. It is a pre-testing of the questionnaire to discover constraints and errors (Sapsford and Jupp, 2006).

By knowing the limitations of the questionnaire, correction and improvement can be made in order to produce a better and effective questionnaire. Therefore, an appropriate and reliable data can be generated. Since pilot test follows the procedures of the main survey, the size of sample for the actual investigation can be determined by using this test. As such, the researchers can arrange an appropriate sample size in the actual survey to develop more accurate data (Kothari, 2004). Besides, Taherdoost (2016) also mentioned that the main objective of the pilot test is to check the understanding level of the questionnaire from the respondents and to verify whether they are able to answer all the questions without feeling confused. In this study, pilot test will be conducted by distributing a total number of 30 questionnaires to respondents.

3.5 Data Analysis Method

After collecting the data from the respondent through questionnaire survey, data analysis is required to generalise the findings (Sapsford and Jupp, 2006). The main purpose of data analysis is to assure that interpretation of the data which collected from the respondents are accurate and appropriate. During the process of data analysis, statistically significant test are adopted to modify, arranging and tabulating the findings (Kothari, 2004). Thereafter, the result will be summarised, tabulated and charted with further interpretations. There are a few of data analysis methods will be used in this research study, which are Cronbach's alpha reliability test, mean ranking, Kruskal-Wallis test and factor analysis.

3.5.1 Cronbach's Alpha Reliability Test

In 1951, Lee Cronbach created alpha as a measurement of the internal consistency for a scale or test. In general, the range for Cronbach's alpha reliability test is between 0 and 1; nevertheless, the coefficient does not have lower limit (Wadkar, et al., 2016). Tavakol and Dennick (2011) further declared that the level of the internal consistency in the scale is depends on the alpha coefficient. For instance, the internal consistency will be greater when the alpha coefficient is closer to 1.0. Furthermore, internal consistency is in relation to items of the test, which measures in a same concept to identify the range of items in the test. In order to ensure validity, internal consistency should be identified before employing a test for the purpose of research. Based on the formula mentioned by Gliem and Gliem (2003), $\alpha = \frac{rk}{[1 + (k - 1)r]}$ where "r" is the mean of the item and "k" is the considered number of items. Subsequently, Gliem and Gliem (2003) and George and Mallery (2016) have indicated a rule of thumb of the range of Cronbach's Alpha Reliability Coefficient which is as shown below:

Table 3.1: Range of Cronbach's Alpha Reliability Coefficient.

Range	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$\alpha < 0.5$	Unacceptable

A good internal consistency contains a high value of Cronbach's alpha. Besides, the reasonable goal for Cronbach's alpha test will be .8. Apart from that, the occurrence of errors in the test is most probably caused by the improper use of alpha (Wadkar, et al., 2016). Moreover, it is noted that Cronbach's alpha cannot present reliability estimates for single items. In terms of the valuation of questionnaires, alpha is a fundamental concept which allows the researchers to include the accuracy and validity for their data interpretation (Bonett and Wright, 2014).

3.5.2 Mean Ranking

In this research study, it is crucial to identify the ranking for each factor by using standard deviation and mean. In the case of having same mean value for 2 or more causes, the cause with lower standard deviation will be reviewed as more important than the other one (Ye, et al., 2015). Mean is used as a measurement for the central tendency of the data, which identifies the position of data collected distribution of the research study. In general, mean is used to examine the relationship between different variables of the research study. Subsequently, the variables can be ranked accordingly after the mean for each variable is computed. The formulae for mean and standard deviation are shown below (Wan, et al., 2014):

$$\text{Mean, } \bar{X} = \frac{\sum_{i=1}^n x_i}{n} \quad (3.1)$$

$$\text{Standard Deviation, } S = \left(\sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{(n-1)}} \right)$$

where,

$X_i = (x_1, x_2 \dots x_n)$, the observed values of the sample
 n = number of observations in the sample

3.5.3 Kruskal-Wallis Test

The Kruskal-Wallis test, also known as H test is a nonparametric equivalent to one way ANOVA. Moreover, it is employed for sample testing to determine whether they were originating from the same distribution. In other words, this test is used for null hypothesis testing (Ostertagová, Ostertag and Kováč, 2014). Also, the way to conduct Kruskal-Wallis test is similar to the Wilcoxon-Mann-Whitney test (U test), which is for more than two independent samples. However, this test does not require assumptions about normality, unlike the one-analysis of variance. Apart from that, the data in Kruskal-Wallis test are ranked from high to low or vice versa to constitute a sample (Theodorsson-Norheim, 1986). In this research, Kruskal-Wallis test is adopted to investigate if there is any significant difference towards influential factors of sustainable housing affordability, housing preferences and strategic measures to reduce affordable housing gap amongst the respondent groups. Based on the study of Kothari (2004), the “H” value is the test statistic which is worked out as shown below:

$$H = \frac{12}{n(n+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(n+1) \quad (3.2)$$

where,

$$n = n_1 + n_2 + \dots + n_k$$

k = number of samples

R_i = the sum of ranks assigned to n_i values of the i th sample

n_i = the number of observations in the i th sample

3.5.4 Factor Analysis

According to Kothari (2004), one of the widely adopted multivariate techniques in research study is factor analysis. It is a statistical approach applicable which gives an indication for the researchers to generate irrelevant variables among numerous correlated variables, into a fewer numbers of fundamental factors (Opoku and Abdul-muhmin, 2010; Lee and Paik, 2011).

In general, there are two main approaches of factor analysis which are exploratory technique and confirmatory technique. In exploratory factor analysis, it allows the researcher to investigate the main attributes to generate a model or theory from a large number of variables. On the other hand, confirmatory factor analysis is to examine a proposed theory. Moreover, confirmatory factor analysis is usually adopted at the later stage of the research, while exploratory approach is normally employed in the early stage of the research study (Williams, Onsman and Brown, 2010).

In this research study, there is a total of 20 influential factors of sustainable housing affordability were listed and factor analysis approach was applied for the findings of underlying factor. Factor analysis is always used in the survey where consists of a large number of variables that is difficult to analysed directly. Hence, by adopting this method, it can identify the latent pattern underneath, simplifying and breaking them down into fewer groups based on interpretable underlying factors revealed. In addition, it is undeniable that evaluation of the data is a very important step before commencement of factor analysis. In view of this, Bartlett's test of Sphericity and Kaiser-Meyer-Olkin test (KMO) were conducted in order to assess the data adequacy (Doloi, et al., 2012).

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter revealed and evaluated the results of the data collected from the questionnaire survey by using graphs and tables. The evaluation and discussion of the generated results are meant to respond to the aims and objectives of the research stated in Chapter 1. Prior to evaluation, Statistical Package for the Social Sciences (SPSS) software is applied to process, rearrange and tabulate the data with techniques mentioned in the previous chapter.

4.2 Pilot Study

Essentially, potential problems could arise during the stage of data collection which are often difficult to be determined and curbed by the researchers (Hulland, Baumgartner and Smith, 2017). In light of this, pilot study is indispensable as a mechanism to remove ambiguities in the questions before collecting data from the main study. On top of that, the other predominant purpose of the pilot test is to ensure the designed questions are sufficient and understandable by respondents.

For the sample size of pilot study, there are several sets of rules to determine such as Memon, et al., (2017) indicates that a sample size of 30 is decent for a pilot test. The sample size originated from Central Limit Theorem which creates a distributional hypothesis of such sample size was to secure that the mean of any samples acquired from the particular population was approximately close to that of the population. Thereupon, a total of 30 out of 48 sets of survey questionnaires were returned, contributing a response rate of 62.50%. In the midst of Covid-19 pandemic, paper-based survey questionnaires were not encouraged to be distributed to the respondents and thus e-survey is applied in this research.

Thereafter, SPSS is adopted to pilot test the returned questionnaires, and subsequently, the alpha value for each category of the questionnaire has been summarised in Table 4.1. As shown in the table below, the alpha values for each section of the questionnaires were greater than 0.70. This implies that

this result is reliable and also achieved excellent internal consistency among the data (Gliem and Gliem, 2003). As a consequence, all these 30 responses would be recorded and included in the main study.

Table 4.1: Cronbach's Alpha Values for Pilot Study.

Category	Number of items	Cronbach's alpha
Influential factors of sustainable housing affordability	20	0.71
Housing preferences based on demographic factors	20	0.78
Strategic measures to reduce affordable housing gap	10	0.82

4.3 Response Rate

In this main research study, the survey questionnaire is distributed through personal contact, email and social media - LinkedIn. The paramount reason to conduct E-survey instead of paper-based survey is on the ground of environmental friendly issues and Covid-19 pandemic. Due to the outbreak of Coronavirus, social isolation and distancing were encouraged by authorities as these tactics could be possibly effective to mitigate mortality and morbidity (Bruns, Kraguljac and Bruns, 2020). For this reason, E-survey is advocated in this situation.

A total of 204 questionnaires were sent out online by using convenience sampling method to respondents who are staying within the Klang Valley area. Nevertheless, only 44.12% of response rate was achieved for the main research study. To be specific, there are merely 90 respondents who returned the questionnaires. As aforementioned, the 30 pilot study questionnaires will also be included in the main study since they remain unaltered, hence, a total of 120 responses were collected and a response rate of 47.62% is obtained. Table 4.2 summarizes the response rate for both pilot study and main study.

Table 4.2: Response Rate

Distribution method	Questionnaire		Response rate
	Distributed	Collected	
Pilot study			
E-survey	48	30	62.50%
Main study			
E-survey	204	90	44.12%
Overall	252	120	47.62%

4.4 Profile of Respondents

Table 4.3 presents a detailed overview of general background information of respondents, namely gender, age group, education level, employment status, monthly income range, marital status and presence of children. Based on the demographic data from the questionnaire collected, female respondents occupied with a percentage of 50.8% which is slightly outnumber male respondents (49.2%).

In terms of age, most of the respondents are from the age group of 18-38 years old (36.7%), followed by the group of 39-59 years old (34.2%), while the remaining are 60 years or older (29.2%). Regarding the education level of respondents, postgraduate and undergraduate degree holders obtained the same amount of percentage which is 33.3%. As a matter of fact, the majority of the respondents from these two categories are from generation Y (18-38 years old) and generation X (39-59 years old). This indicates that the numbers of respondents receiving tertiary education in younger generations are more than older generations as they believed that the level of education has a significant impact on getting a well paid job (Nimon, 2007). Meanwhile, for the category of diploma and high school, they occupied a small amount of the percentage, contributing 19.2 percent and 14.2 percent respectively. Furthermore, there are only minimal respondents who fall into the category of unemployed and that are only 15 out of 120 respondents, which signified that more than 80 percent of the respondents earn a living in Malaysia.

For the monthly income, there is only a minor difference among the three groups, which implies that income cohorts are equally distributed and suitable to be tested in this survey study. Apart from that, only 40 percent of the respondents are single, while the remaining ones are either married or

divorced. Last but not least, respondents without presence of children outpace respondents staying with children, accounting for 56.7 percent as against 43.3 percent, respectively.

In a nutshell, these survey questionnaires were almost equally disseminated to each category. However, generation cohorts and income groups will be tested in this research as respondent groups. This is because the demographic factors for age and income associated with the substantial differences in their perspectives (Andrews and Herzog, 1986). Therefore, these two groups are interesting to be tested.

Table 4.3: Demographic Profile of Respondents

Parameter	Categories	Total	Frequency (%)
Gender	Male	59	49.2
	Female	61	50.8
Age group	18 - 38 years old (Generation Y)	44	36.7
	39 - 59 years old (Generation X)	41	34.2
	60 years or older (Baby Boomers)	35	29.2
Education level	Postgraduate Degree (Master's Degree/ PhD)	40	33.3
	Undergraduate Degree (Bachelor's Degree)	40	33.3
	Diploma	23	19.2
	High School	17	14.2
Employment status	Unemployed	15	12.5
	Employed	48	40.0
	Self-employed	39	32.5
	Retired	18	15.0
Monthly income range	< RM 4,849	43	35.8
	RM 4,850 - RM 10,960	38	31.7
	> RM10,961	39	32.5
Marital status	Single	48	40.0
	Married	53	44.2
	Divorced	19	15.8
Presence of children	No	68	56.7
	Yes	52	43.3

4.5 Reliability of Results

Cronbach's alpha has been adopted and carried out as an indicator of internal consistency through SPSS in this research study. In other words, this approach is used to gauge the reliability of the data collected from the survey questionnaire, which is usually applied on Likert scale questions (Ercan, et al., 2007). Table 4.4 reveals the computed coefficient value for the three categories in questionnaire which are 0.893, 0.828 and 0.873. As a rule of thumb, when the scale reliability value is higher than 0.8, it denotes that the internal consistency of the data is considered as good (Bonett and Wright, 2014; Tavakol and Dennick, 2011; Wadkar, et al., 2016; Gliem and Gliem, 2003). As such, the data obtained from the survey questionnaire has achieved above acceptable levels of Cronbach's alpha that are deemed to be reliable.

Table 4.4: Cronbach's Coefficient Alpha Values for Reliability Test.

Category	Number of items	Cronbach's alpha
Influential factors of sustainable housing affordability	20	0.893
Housing preferences based on demographic factors	20	0.828
Strategic measures to reduce affordable housing gap	10	0.873

4.6 Mean Ranking

The critical factors affecting sustainable housing affordability, housing preferences based on demographic factors and strategic measures to reduce affordable housing gap are ranked according to mean and standard deviation values based on perceptions of different generation cohorts (generation Y, generation X and baby boomers) and income groups (B40, M40 and T20).

4.6.1 Influential Factors of Sustainable Housing Affordability

Table 4.5 and Table 4.6 indicate the mean ranking of influential factors of sustainable housing affordability according to perspectives of generation cohorts and income groups, respectively. To be more precise, the mean values were arranged in descending order which the largest mean score is ranked as 1st.

In terms of **generation cohort, generation Y's (18-38 years old)** perception of top five most agreed critical factors of sustainable housing affordability are listed as below:

- (1) Housing price in relation to income (Mean = 4.477; δ = 0.762)
- (2) Employment opportunities accessibility (Mean = 4.341; δ = 0.776)
- (3) Crime rate (Mean = 4.227; δ = 0.961)
- (4) Quality performance of housing (Mean = 4.182; δ = 0.786)
- (5) Availability of mortgage and interest rate (Mean = 4.136; δ = 0.765)

Furthermore, from the view point of **generation X (39-59 years old)**, the most five significant influential factors of sustainable housing affordability are:

- (1) Housing price in relation to income (Mean = 4.512; δ = 0.925)
- (2) Crime rate (Mean = 4.366; δ = 1.019)
- (3) Rental price in relation to income (Mean = 4.220; δ = 0.852)
- (4) Employment opportunities accessibility (Mean = 4.000; δ = 1.000)
- (5) Availability of mortgage and interest rate (Mean = 4.000; δ = 1.025)

Moreover, from the perspective of **baby boomers (60 years or older)**, here are the first five fundamental factors of sustainable housing affordability:

- (1) Housing price in relation to income (Mean = 4.343; δ = 0.765)
- (2) Availability of mortgage and interest rate (Mean = 4.286; δ = 0.667)
- (3) Crime rate (Mean = 4.143; δ = 0.879)
- (4) Quality performance of housing (Mean = 4.114; δ = 0.631)
- (5) Rental price in relation to income (Mean = 4.057; δ = 0.684)

Regarding to **income groups**, the five main crucial factors of sustainable housing affordability based on **B40 (<RM4,849)** are stated as below:

- (1) Housing price in relation to income (Mean = 4.512; δ = 0.768)
- (2) Crime rate (Mean = 4.372; δ = 0.900)
- (3) Quality performance of housing (Mean = 4.256; δ = 0.759)
- (4) Availability of mortgage and interest rate (Mean = 4.233; δ = 0.718)
- (5) Rental price in relation to income (Mean = 4.186; δ = 0.794)

Meanwhile, from **M40's (RM4,850-RM10,960)** opinions, the top five vital components of sustainable housing affordability are:

- (1) Housing price in relation to income (Mean = 4.158; δ = 1.053)
- (2) Employment opportunities accessibility (Mean = 4.105; δ = 1.008)
- (3) Quality performance of housing (Mean = 3.947; δ = 0.899)
- (4) Rental price in relation to income (Mean = 3.947; δ = 0.899)
- (5) Crime Rate (Mean = 3.947; δ = 1.089)

On the other than, the five factors most agreed by **H20 (>RM10,961)** are:

- (1) Housing price in relation to income (Mean = 4.667; δ = 0.478)
- (2) Crime Rate (Mean = 4.410; δ = 0.818)
- (3) Availability of mortgage and interest rate (Mean = 4.385; δ = 0.673)
- (4) Rental price in relation to income (Mean = 4.179; δ = 0.756)
- (5) Quality performance of housing (Mean = 4.026; δ = 0.873)

As a whole, the top five important influential factors of sustainable housing affordability associated with **generational differences** and **income groups** are illustrated as below:

- (1) Housing price in relation to income (Mean = 4.450; δ = 0.818)
- (2) Crime Rate (Mean = 4.250; δ = 0.955)
- (3) Availability of mortgage and interest rate (Mean = 4.130; δ = 0.840)
- (4) Rental price in relation to income (Mean = 4.110; δ = 0.818)
- (5) Employment opportunities accessibility (Mean = 4.100; δ = 0.902)

In statistics, ranking pertains to the transformation of data whereupon numerical values are substituted by rank when the data are categorized. In particular, the ranking is first on the basis of the mean scores of the variables. Nevertheless, if two or more variables possess the same mean scores, the variable with lower standard deviation will be viewed as more important, which is ranked as the highest (Kothari, 2004). In this study, there are a pair of variables sharing the same mean value and standard deviation should be highlighted which are quality performance of housing and rental price in relation to income in Table 4.6. As such, they are sharing the similar ranking.

As manifested in Table 4.5 and 4.6, the rankings of sustainable housing affordability between generation cohorts and income groups were different to be largely identical, but with slight disparities. In essence, the top five most agreed criteria from respondents are housing price in relation to income (A1),

crime rate (A16), availability of mortgage and interest rate (A3), rental price in relation to income (A2) and employment opportunities accessibility (A8) with mean scores of 4.450, 4.250, 4.130, 4.110 and 4.100 respectively.

Household income is one of the fundamental factors influencing the purchase decision of home buyers, and thus, it is evitable that affordability is always associated with income. Additionally, Adabre, et al. (2020), Mulliner and Maliene (2011) and Mulliner, Smallbone and Maliene (2013) also addressed that the prevailing factor of sustainable housing affordability in Malaysia is household income. Despite the fact that, unaffordable for residential houses in Malaysia is getting severe due to the disproportionately increment of housing cost at an astonishing pace as compared to the slow growth of household income. Accordingly, high housing costs have become an encumbrance to house buyers, especially B40 and M40 in getting a house as there is a huge gap between household income and housing costs (Tan, 2013). This is further established by Wang, Jung and Lim (2012), who claimed that the migrants are less motivated to emigrate due to the rises of housing price in Beijing, which led to unsustainable demographic and growth of population. At the same time, low income households in Beijing have to reduce their expenditure on essential needs just to rent accommodation, or else they will be homeless. As such, this has also proved that rental price in relation to income is similarly important as housing price in relation to income.

According to the research by Chan and Adabre (2019), they have conducted a multi-national survey with 18 countries which Malaysia is included and classified under developing countries. Out of twenty-one criteria of sustainable housing affordability, the housing price and rental cost were the most highly rated among developing and developed countries. Apart from that, it has also coincided with research undertaken by Adabre and Chan (2019), who revealed that affordability measures usually emphasize the financial burden of housing price. In order to support the statement, a survey was carried out and subsequently disclosed that housing price and rental cost in relation to income were ranked as first and second important criteria, respectively. In the same vein, Adabre and Chan (2018) also figured out that housing and rental costs perceived as major considerations in terms of sustainable housing affordability. Besides, these two variables are germane to

evaluate the economic viability of housing. Although other factors are necessary for sustainable housing affordability, high mean values of housing price and rental cost in relation to income implies that priority is most centralised on financial affordability. As a consequence, this is precisely why A1 and A2 were ranked in top 5 in this survey.

Furthermore, availability of mortgages and interest rates is ranked as third place by respondents in this research. Based on the study of Soon and Tan (2019), the purchasing power of households was hindered by high interest rates which signifies that the affordability issue can be exacerbated by the loans with high interest rates. Said, et al. (2014) also asserted that most Malaysians hinge on financial assistance, namely down payment and mortgage interest payments to buy a house. Meanwhile, according to Wang, Jung and Lim (2012), they discovered that the majority of young people in China need to be thrifty in daily expenditures such as cutting down their spending on entertainment, delaying their childbirth and marriage just to preserve money to purchase a house. Therefore, availability of mortgages and interest rate are relatively fundamental to those who plan to buy house and also act as an influential criteria of sustainable housing affordability.

On the other hand, employment opportunities accessibility has also received a high rank order as compared to other accessibility. This may owe to the fact that vicinity career opportunities will have a direct affect on household income. It is unquestionable that staying far from the workplace will give rise to a surge in travelling cost and time (Tan, 2012b; a). Hence, easy access to employment opportunities is imperative as a criterion to sustainable housing affordability. Apparently, considering that affordability is commonly gauged and defined by financial attributes, it is not surprising that the housing price in relation to income, rental cost in relation to income, availability of mortgages and interests and employment opportunities accessibility were in high ranking order overall across generation cohorts and income groups.

Notwithstanding the fact that the key success criterion associated with price affordability cannot be underemphasized, it is not a comprehensive measure for sustainable housing. As shown in the findings below, crime rate has rated as the second highest factor by respondents. This is very much aligned with the research by Mulliner, Smallbone and Maliene (2013)

Mulliner, Malys and Maliene (2016) and Keall et al.(2010), who discovered that crime rate is in high ranking order for criteria of sustainable housing affordability. In fact, safety acts as an indicator for sustainability development where house buyers should not have fear for their safety within the neighbourhood and their house areas (Lim, et al., 2018; Mulliner and Maliene, 2015).

Table 4.5: Mean and Ranking on Influential Factors of Sustainable Housing Affordability (Generation Cohorts)

Ref	Influential factors	Overall (N = 120)			18 - 38 years old (Generation Y) (N = 44)			39 - 59 years old (Generation X) (N = 41)			60 years or older (Baby Boomers) (N = 35)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A1	Housing price in relation to income	4.450	0.818	1	4.477	0.762	1	4.512	0.925	1	4.343	0.765	1	3.305	0.192
A16	Crime rate	4.250	0.955	2	4.227	0.961	3	4.366	1.019	2	4.143	0.879	3	2.735	0.255
A3	Availability of mortgage and interest rate	4.130	0.840	3	4.136	0.765	5	4.000	1.025	5	4.286	0.667	2	1.164	0.559
A2	Rental price in relation to income	4.110	0.818	4	4.045	0.888	7	4.220	0.852	3	4.057	0.684	5	2.040	0.361
A8	Employment opportunities accessibility	4.100	0.902	5	4.341	0.776	2	4.000	1.000	4	3.914	0.887	7	5.840	0.054
A13	Quality performance of housing	4.080	0.846	6	4.182	0.786	4	3.951	1.048	6	4.114	0.631	4	0.924	0.630
A5	Availability of public transport services	3.890	0.942	7	3.977	0.792	9	3.732	1.096	7	3.971	0.923	6	1.038	0.595
A20	Safety performance of housing	3.750	0.955	8	4.023	0.849	8	3.585	1.140	10	3.600	0.775	9	5.389	0.068
A4	Availability of incentives	3.720	0.916	9	4.045	0.608	6	3.537	1.098	11	3.543	0.919	10	7.506	0.023*
A12	Shops accessibility	3.700	1.026	10	3.977	0.876	10	3.634	1.135	9	3.429	1.008	12	6.774	0.034*
A17	Environmental problems	3.600	1.155	11	3.636	1.143	15	3.659	1.237	8	3.486	1.095	11	0.755	0.686
A14	Maintainability of housing	3.510	0.970	12	3.705	0.954	11	3.415	1.048	13	3.371	0.877	14	3.149	0.207
A9	Medical care services accessibility	3.500	1.108	13	3.682	1.073	13	3.171	1.223	16	3.657	0.938	8	4.586	0.101
A19	Energy efficiency of housing	3.470	1.166	14	3.568	0.998	16	3.439	1.361	12	3.371	1.140	15	0.432	0.806

Table 4.5: Mean and Ranking on Influential Factors of Sustainable Housing Affordability (Generation Cohorts) (Cont'd)

Ref	Influential factors	Overall (N = 120)			18 - 38 years old (Generation Y) (N = 44)			39 - 59 years old (Generation X) (N = 41)			60 years or older (Baby Boomers) (N = 35)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A15	Tenure Security	3.320	1.303	15	3.705	1.193	12	3.220	1.370	15	2.943	1.259	17	6.789	0.034*
A6	Availability of waste management	3.270	1.037	16	3.409	0.948	18	3.000	1.118	17	3.429	1.008	13	3.901	0.142
A10	Education services accessibility	3.230	1.172	17	3.409	1.148	19	3.317	1.234	14	2.914	1.095	18	3.905	0.142
A7	Availability of green public spaces	3.130	1.164	18	3.432	1.065	17	2.854	1.236	18	3.057	1.136	16	5.576	0.062
A11	Leisure facilities accessibility	3.060	1.259	19	3.659	1.098	14	2.732	1.304	19	2.686	1.132	19	15.958	0.000**
A18	House appearance	2.770	1.436	20	3.341	1.346	20	2.512	1.468	20	2.343	1.305	20	10.780	0.005**

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant.

Table 4.6: Mean and Ranking on Influential Factors of Sustainable Housing Affordability (Income Groups)

Ref	Influential factors	Overall (N = 120)			< RM 4,849 (B40) (N = 43)			RM 4,850 - RM 10,960 (M40) (N = 38)			> RM 10,961 (H20) (N = 39)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A1	Housing price in relation to income	4.450	0.818	1	4.512	0.768	1	4.158	1.053	1	4.667	0.478	1	6.245	0.044*
A16	Crime rate	4.250	0.955	2	4.372	0.900	2	3.947	1.089	5	4.410	0.818	2	6.311	0.043*
A3	Availability of mortgage and interest rate	4.130	0.840	3	4.233	0.718	4	3.763	0.998	7	4.385	0.673	3	11.178	0.004**
A2	Rental price in relation to income	4.110	0.818	4	4.186	0.794	5	3.947	0.899	3	4.179	0.756	4	2.010	0.366
A8	Employment opportunities accessibility	4.100	0.902	5	4.163	0.814	7	4.105	1.008	2	4.026	0.903	6	0.522	0.770
A13	Quality performance of housing	4.080	0.846	6	4.256	0.759	3	3.947	0.899	3	4.026	0.873	5	3.599	0.165
A5	Availability of public transport services	3.890	0.942	7	4.070	0.768	9	3.816	1.036	6	3.769	1.012	8	1.671	0.434
A20	Safety performance of housing	3.750	0.955	8	4.070	0.828	10	3.500	1.007	8	3.641	0.959	9	7.815	0.020*
A4	Availability of incentives	3.720	0.916	9	4.116	0.662	8	3.474	1.006	9	3.538	0.942	11	12.771	0.002**
A12	Shops accessibility	3.700	1.026	10	4.163	0.721	6	3.316	1.233	11	3.564	0.912	10	14.659	0.001**
A17	Environmental problems	3.600	1.155	11	3.884	1.117	12	3.079	1.217	15	3.795	0.978	7	11.050	0.004**
A14	Maintainability of housing	3.510	0.970	12	3.791	0.914	13	3.368	1.051	10	3.333	0.898	15	6.298	0.043*

Table 4.6: Mean and Ranking on Influential Factors of Sustainable Housing Affordability (Income Groups) (Cont'd)

Ref	Influential factors	Overall (N = 120)			< RM 4,849 (B40) (N = 43)			RM 4,850 - RM 10,960 (M40) (N = 38)			> RM 10,961 (H20) (N = 39)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A9	Medical care services accessibility	3.500	1.108	13	3.953	0.999	11	2.947	1.089	16	3.538	1.022	12	16.474	0.000**
A19	Energy efficiency of housing	3.470	1.166	14	3.721	1.008	15	3.211	1.234	12	3.436	1.231	14	3.318	0.190
A15	Tenure Security	3.320	1.303	15	3.767	1.231	14	3.105	1.311	14	3.026	1.267	18	8.041	0.018*
A6	Availability of waste management	3.270	1.037	16	3.395	0.929	19	2.895	1.060	17	3.513	1.048	13	8.325	0.016*
A10	Education services accessibility	3.230	1.172	17	3.465	1.202	18	3.132	1.166	13	3.077	1.133	16	2.758	0.252
A7	Availability of green public spaces	3.130	1.164	18	3.558	1.161	17	2.737	1.032	18	3.026	1.158	17	11.584	0.003**
A11	Leisure facilities accessibility	3.060	1.259	19	3.721	1.141	16	2.579	1.130	19	2.795	1.218	19	19.131	0.000**
A18	House appearance	2.770	1.436	20	3.302	1.440	20	2.237	1.261	20	2.692	1.417	20	11.209	0.004**

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant.

4.6.2 Housing Preferences based on Demographic Factors

Pursuant to a study of (Leh, Mansor and Musthafa, 2016; Berko and Dokmeci, 2000; Wang and Li, 2006), who avowed that majority of the research on housing preferences are generally focused on the demographic factors, namely family size, age group, income cohorts, marital status, employment status and education level. Since the findings for housing preferences based on generation cohorts and income groups are more interesting as compared to the others, wherefore these two respondent groups are emphasized in this research. Table 4.7 and 4.8 manifested the mean and ranking of housing preferences according to generation cohorts and income groups, respectively.

As aforementioned, there are three different **age groups** examined in this survey, which are 18-38 years old (Generation Y), 39-59 years old (Generation X) and 60 years or older (Baby Boomers). In perspective of **generation Y**, the five most important housing preferences are:

- (1) Housing price in relation to income (Mean = 4.591; δ = 0.658)
- (2) Crime rate (Mean = 4.477; δ = 0.762)
- (3) Quality performance of housing (Mean = 4.250; δ = 0.651)
- (4) Availability of mortgage and interest rate (Mean = 4.227; δ = 0.774)
- (5) Shops accessibility (Mean = 4.205; δ = 0.701)

Furthermore, the top five housing preferences as perceived by **generation X** are:

- (1) Housing price in relation to income (Mean = 4.561; δ = 0.709)
- (2) Crime rate (Mean = 4.537; δ = 0.745)
- (3) Availability of mortgage and interest rate (Mean = 4.244; δ = 0.830)
- (4) Rental price in relation to income (Mean = 4.220; δ = 0.936)
- (5) Environmental problems (Mean = 4.171; δ = 0.704)

Besides, in the viewpoint of **baby boomers**, the five most significant considerations when buying a house are:

- (1) Crime rate (Mean = 4.543; δ = 0.611)
- (2) Medical care services accessibility (Mean = 4.200; δ = 0.719)
- (3) Leisure facilities accessibility (Mean = 4.029; δ = 0.985)

(4) Shops accessibility (Mean = 4.000; $\delta = 0.840$)

(5) Housing price in relation to income (Mean = 3.886; $\delta = 0.932$)

According to the ranking of housing preferences, “crime rate” was ranked as the first among the other preferences, with a mean value of 4.520. Baby boomers perceived that crime rate is their first priority when buying a house, whereas generation Y and X revealed it as the second most significant housing preference. Based on the study of Mohit and Elsawahli (2010), who prescribed that about 90% of crimes mainly occurred in the housing areas in Malaysia. The increment of crime in housing areas has generated considerable fear within the community which has become a pressing concern among most of the homebuyers. As such, homebuyers’ decision will be affected by the safety of a neighbourhood. Finding agree with Niedomysl (2008) and Yap, Yong and Skitmore (2019), the importance of a safety environment when purchasing a house has frequently got a high ranking in preferences studies, albeit different generations. This is due to the fact that a crime-free environment is a basic need for every household. Additionally, a research undertaken by Thanaraju, et al. (2019) have found out that most homebuyers in Malaysia are willing to pay more in order to ensure a safer neighbourhood. On the other hand, Wang and Li (2006) also asserted that generation Y in Guangzhou viewed that “feeling of safety” is a fundamental consideration when buying a property. Since the crime rate has a direct impact in threatening personal safety, it was not surprising that the majority of the respondents in this survey have rated “crime rate” as an extremely important housing preference.

Furthermore, with a mean value of 4.38, “housing price in relation to income” has been placed as the second highest important preference out of twenty factors. However, only generation Y and X opined that “housing price in relation to income” is the most paramount consideration, while in the perception of baby boomers, the same preference is only ranked at fifth place. It stems from the fact that young and middle-aged people are more likely to undergo financial stress as compared to older age groups (Bujang, et al., 2017). Accordingly, financial stress experienced by young and middle-aged people has a direct impact in owning a house, which this situation is known as

housing affordability stress. Based on a research in Hong Kong, Li (2015) has adopted mixed methods to figure out generation Y and X' s demands towards homeownership, which the results have emphasised that both of these generations are more concerned about “housing prices and income” than the other preferences. This survey is also supported by Yap, Yong and Skitmore (2019), who ascertained that dwelling costs is one of the crucial preferences in the housing decision of young adults, namely generation Y. Nevertheless, they have further elaborated that the matter for the price component of housing is not only just restricted to young adults, but also it is quite common over the entire population.

Next, quality performance of housing was ranked as third place with a mean score of 4.050. Nonetheless, only generation Y opined that quality performance of housing as the third significant priority according to the ranking. This has been indicated by Kam, et al. (2018), where generation Y showed a tendency to purchase houses with minimum renovation or fully renovated. In Hong Kong, the findings by Li (2015) has also starkly highlighted that generation Y perceived “housing quality” as the most important consideration while the least important concern was “personal housing needs”. It is undeniable that high quality housing such as building construction, size of housing and comfort level are imperative to be recognized as prominent as other sustainable housing criteria. Also, Yap and Ng (2018) clarified affordable houses do not constitute low cost housing, therefore, developers should not diminish the quality of building materials and construction. According to Yap, Yong and Skitmore (2019), housing conditions can act as a measure to determine homebuyers’ well-being and health. To be specific, a more productive, meaningful and healthy life can be incurred by living in a good quality performance of housing. Yap, Yong and Skitmore (2019) also further explained that quality performance of housing can be accomplished by encountering legal, aesthetic and functional requirements. However, it was surprising that more than 70% of the respondents are willing to pay more for better house quality. On the other hand, only baby boomers ranked “leisure facilities accessibility” as one of the top five preferences. This may be due to that most of the baby boomers are expected to be in their retirement stage, and thus, they have more time to

spend on leisure activities compared to generation Y and X (Kim, Fidgeon and Kim, 2015; Patterson and Pegg, 2009).

Apart from that, “environment problem” has also been ranked as one of the top five most important housing preferences among the respondents. In this research, it was amazed to reveal that generation X is the only group who think that this variable is critical to consider before owning a house even though generation Y acquired more environmental education in comparison to generation X. This result has coincided with a study undertaken by Li (2015) in Hong Kong, which generation X ranked “environmental problems” as top five housing preferences. Other than that, Beamish, Goss and Emmel (2001) mentioned that every household, albeit different demographic factors, should be cognizant of the impact of environmental issues. For instance, some prevalent concerns like the air pollution and water pollution will threaten households’ health. Additionally, from the perception of generation Y and X, “availability of mortgage and interest rate” has also been viewed as a notable consideration which they have ranked it as one of the top five preferences, even though this variable is not listed in top five significant preferences overall. Soon and Tan (2019) have grimly highlighted that restriction in buying houses among young adults is due to the high interest rate of housing loan, especially for those who graduate with debts. In fact, the researchers also revealed that 53% of respondents felt burdened by their education loans and the rules and regulation for housing application are way stricter than last time executed by the Central Bank of Malaysia.

Last but not least, the results manifested that “shops accessibility” was ranked as the fifth significance factor in overall. According to the Table 4.7, generation Y and baby boomers have ranked this variable as fifth and fourth place, respectively. Based on the study of Thanaraju, et al. (2019), shops accessibility is one of the preferences which can affect the buyer’s decision when buying a house. The results in this survey are very much aligned with the research of Leh, Mansor and Musthafa (2016), where generation Y preferred “proximity to retail shops” is a vital consideration to fulfil their preference of housing. Concurrently, from the perspective of baby boomers, older households perceived to stay in housing areas with easy access to retail shops in Southern China (Ma and Chow, 2016). This is because the majority

of homebuyers perceive that shops' accessibility can bring convenience to them (Tan, 2012b). Nevertheless, the main possible reason which generation X did not include “shop accessibility” in their top five preferences may be due to awareness of high concentration of retailers. For this reason, it is more likely to induce noise pollution and overcrowding for those who are staying near to shops (Tan, 2012b).

In terms of **income cohorts**, Table 4.8 presented the mean and ranking of housing preferences based on three distinct income groups, which have been classified as B40 (<RM4,849), M40 (RM4,850- RM10,960) and T20 (> RM10,961). From the perspective of group **B40**, they have ranked these five variables as important:

- (1) Housing price in relation to income (Mean = 4.558; δ = 0.796)
- (2) Crime rate (Mean = 4.512; δ = 0.736)
- (3) Shops accessibility (Mean = 4.233; δ = 0.812)
- (4) Rental price in relation to income (Mean = 4.209; δ = 0.914)
- (5) Quality performance of housing (Mean = 4.186; δ = 0.699)

Moreover, the five important considerations when buying a house for group **M40** are:

- (1) Housing price in relation to income (Mean = 4.605; δ = 0.638)
- (2) Crime rate (Mean = 4.421; δ = 0.722)
- (3) Rental price in relation to income (Mean = 4.263; δ = 0.860)
- (4) Availability of mortgage and interest rate (Mean = 4.184; δ = 0.730)
- (5) Energy efficiency of housing (Mean = 4.026; δ = 0.944)

However, group **H20** have a different perspective than group B40 and M40, where their top five most important housing preferences are listed as below:

- (1) Crime rate (Mean = 4.615; δ = 0.673)
- (2) Shops accessibility (Mean = 4.179; δ = 0.683)
- (3) Medical care services accessibility (Mean = 4.077; δ = 0.774)
- (4) Leisure facilities accessibility (Mean = 4.051; δ = 1.099)
- (5) Environmental problems (Mean = 4.026; δ = 0.743)

Overall, the top 5 most fundamental housing preferences are:

- (1) Crime rate (Mean = 4.520; δ = 0.710)
- (2) Housing price in relation to income (Mean = 4.380; δ = 0.821)
- (3) Quality performance of housing (Mean = 4.050; δ = 0.696)
- (4) Environmental problems (Mean = 4.040; δ = 0.793)
- (5) Shops accessibility (Mean = 4.010; δ = 0.855)

As aforesaid, “crime rate” has achieved the highest ranking overall, with a mean value of 4.520. Similarly to the generation cohort, every income group perceived that “crime rate” is a very important factor to be considered before buying a house, albeit differences exist amongst the group. To be more precise, group B40 and M40 have ranked “crime rate” in second place, whereas group H20 think that “crime rate” is their first priority. It is not odd to know that “crime rate” has a high order ranking as a crime-free environment is a basic necessity to everyone (Niedomysl, 2008). Pursuant to a research by Donnelly (1988), who asserted that one of the grave effects of crime for the residents is fear of crime, where “fear” can result in households spending large amounts of money in alarms, additional security locks and lighting systems and many others. Accordingly, the “crime rate” issue in a neighbourhood will affect homebuyers’ decision when purchasing a house (Yap, Yong and Skitmore, 2019). Despite the disparities in income levels, safety considerations have always been ranking high in preferences studies (Niedomysl, 2008). Additionally, Cheuk and Ping (2012) also proclaimed that high income households are more concerned about poor neighbourhood with high crime rates, as compared to low and middle income groups.

In terms of housing price in relation to income, this variable has been ranked as second highest preferences amongst the respondents. It is not strange to discover that only group B40 and M40 considered “housing price in relation to income” as their prime preference, while group H20 were less concerned about this variable when buying a house. In Malaysia, the imbalance of household income and housing price has driven the housing market to be severely unaffordable which constitutes a grave concern to most Malaysians. In particular, the high level of housing price results in unaffordable in purchasing a house amongst low (B40) and middle (M40) income households, and this is because the growth of housing price is more rapid than income

(Soon and Tan, 2019). This statement has also conformed to a research by Opoku and Abdul-muhmin (2010), who indicated that housing prices in Saudi Arabia are on the rise, where it is greatly growing faster than household income. Moreover, Soon and Tan (2019) also further explicated there is a huge gap between housing price and household income, especially in city areas. On the contrary, the financial ability of group H20 allows them to purchase properties with higher price and less restriction in terms of pricing, as compared to low and middle income groups. A Korean researcher has found out that high income households were less concerned about housing prices; however, they are more worried about accessibility problems (Jun, 2013a). This has validated that group H20 cares less about housing price among other income groups, generally.

In this survey, quality performance of housing was ranked as third place amongst the respondents. However, B40 is the only group who has ranked this variable in fifth place. Based on the studies of Opoku and Abdul-muhmin (2010), he signified that low income earners have ranked “housing quality” in high order ranking. Furthermore, most of the low income households do not have alternative options for quality housing due to financial constraints. For this reason, low income households normally tend to buy a house with minimum renovation and maintenance works (Bakhtyar, et al., 2012). Yap and Ng (2018) also expressed that affordable housing is not equal to low cost housing, which means that developers should ensure certain quality performance of houses and avoid using low quality of building materials.

Regarding environmental issues, this variable has been ranked as fourth in this study. It is prevalent to reveal that group H20 perceived that “environmental problem” is a grave consideration when purchasing a house. Beamish, Goss and Emmel (2001) mentioned that high income households are willing to pay more for a clean neighbourhood. Nevertheless, in Turkish study, Berko and Dokmeci (2000) found out that “environmental problem” is essential for all levels of income groups in Istanbul, which means that they are more likely to live in clean environment areas. In addition, Beamish, Goss and Emmel (2001) also mentioned that every household should be concerned about environmental issues such as water and air pollution, which might affect their health.

Last but not least, shops accessibility with a mean value of 4.010 was ranked as one of the five significant housing preferences by respondents. Surprisingly, only B40 and H20 opined that easy access to shops are fundamental to them. It is a more remarkable fact that availability of shops nearby will bring convenience to the households, as well as saving time and transportation fees. A Korean researcher also stated that high income households were more likely to be influenced by accessibility matters, as compared to low and middle income groups (Jun, 2013a). Meanwhile, Table 4.8 manifested that “shops accessibility”, “medical care services accessibility” and “leisure facilities accessibility” has been ranked in top five housing preferences from the perception of H20. This has validated with the findings of Jun (2013a), who highlighted that higher income households preferred to stay in areas with good accessibility. However, a study from a Sweden researcher combated that high income households are less likely concerned about leisure facilities but more focus on employment accessibility (Niedomysl, 2008).

All in all, it may not be too drastic to draw a conclusion, claiming that group H20 possessed higher incomes as a consequence of priorities, where they chose less importance in financial attributes. Based on the Table 4.8, the mean and ranking of H20 had a statistically significant difference in comparison with group B40 and M40.

Table 4.7: Mean and Ranking on Housing Preferences based on Demographic Factors (Generation Cohorts)

Ref	Housing Preferences	Overall (N = 120)			18 - 38 years old (Generation Y) (N = 44)			39 - 59 years old (Generation X) (N = 41)			60 years or older (Baby Boomers) (N = 35)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A16	Crime rate	4.520	0.710	1	4.477	0.762	2	4.537	0.745	2	4.543	0.611	1	0.201	0.904
A1	Housing price in relation to income	4.380	0.821	2	4.591	0.658	1	4.561	0.709	1	3.886	0.932	5	18.126	0.000**
A13	Quality performance of housing	4.050	0.696	3	4.250	0.651	3	4.073	0.721	7	3.771	0.646	6	9.458	0.009**
A17	Environmental problems	4.040	0.793	4	4.182	0.896	7	4.171	0.704	5	3.714	0.667	7	12.346	0.002**
A12	Shops accessibility	4.010	0.855	5	4.205	0.701	5	3.805	0.980	9	4.000	0.840	4	3.662	0.160
A3	Availability of mortgage and interest rate	4.000	0.870	6	4.227	0.774	4	4.244	0.830	3	3.429	0.778	11	23.351	0.000**
A2	Rental price in relation to income	3.980	0.948	7	4.182	0.843	6	4.220	0.936	4	3.429	0.884	12	17.760	0.000**
A11	Leisure facilities accessibility	3.760	1.053	8	3.909	0.772	10	3.366	1.260	18	4.029	0.985	3	6.989	0.030*
A9	Medical care services accessibility	3.760	1.085	9	3.568	1.208	16	3.585	1.117	10	4.200	0.719	2	7.040	0.030*
A20	Safety performance of housing	3.720	0.995	10	4.114	0.945	8	3.561	0.950	11	3.429	0.979	13	11.306	0.004**
A19	Energy efficiency of housing	3.720	1.061	11	3.909	1.053	12	3.927	1.034	8	3.257	0.980	14	11.078	0.004**
A5	Availability of public transport services	3.720	1.161	12	3.909	1.074	13	3.512	1.267	14	3.714	1.126	9	2.094	0.351
A7	Availability of green public spaces	3.530	1.037	13	3.545	0.951	17	3.366	1.067	17	3.714	1.100	8	2.182	0.336

Table 4.7: Mean and Ranking on Housing Preferences based on Demographic Factors (Generation Cohorts) (Cont'd)

Ref	Housing Preferences	Overall (N = 120)			18 - 38 years old (Generation Y) (N = 44)			39 - 59 years old (Generation X) (N = 41)			60 years or older (Baby Boomers) (N = 35)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A6	Availability of waste management	3.520	0.970	14	3.477	1.045	19	3.463	0.897	15	3.629	0.973	10	0.576	0.750
A18	House appearance	3.490	1.174	15	3.909	0.960	11	3.390	1.243	16	3.086	1.197	16	9.500	0.009**
A4	Availability of incentives	3.440	0.933	16	3.795	0.904	14	3.537	0.869	12	2.886	0.796	18	19.906	0.000**
A14	Maintainability of housing	3.430	0.923	17	3.773	0.803	15	3.244	0.994	19	3.229	0.877	15	9.751	0.008**
A10	Education services accessibility	3.310	1.413	18	3.455	1.229	20	4.098	0.970	6	2.200	1.389	19	31.651	0.000**
A8	Employment opportunities accessibility	3.300	1.424	19	4.023	0.849	9	3.537	1.267	13	2.114	1.451	20	30.723	0.000**
A15	Tenure Security	3.280	1.037	20	3.523	1.067	18	3.195	1.005	20	3.057	0.998	17	4.472	0.107

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant.

Table 4.8: Mean and Ranking on Housing Preferences based on Demographic Factors (Income Groups)

Ref	Housing Preferences	Overall (N = 120)			< RM 4,849 (B40) (N = 43)			RM 4,850 - RM 10,960 (M40) (N = 38)			> RM 10,961 (H20) (N = 39)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A16	Crime rate	4.520	0.710	1	4.512	0.736	2	4.421	0.722	2	4.615	0.673	1	1.837	0.399
A1	Housing price in relation to income	4.380	0.821	2	4.558	0.796	1	4.605	0.638	1	3.949	0.857	7	17.638	0.000**
A13	Quality performance of housing	4.050	0.696	3	4.186	0.699	5	3.974	0.636	6	3.974	0.743	6	2.508	0.285
A17	Environmental problems	4.040	0.793	4	4.163	0.843	6	3.921	0.784	7	4.026	0.743	5	2.449	0.294
A12	Shops accessibility	4.010	0.855	5	4.233	0.812	3	3.579	0.919	11	4.179	0.683	2	13.025	0.001**
A3	Availability of mortgage and interest rate	4.000	0.870	6	4.140	0.861	8	4.184	0.730	4	3.667	0.927	10	8.020	0.018*
A2	Rental price in relation to income	3.980	0.948	7	4.209	0.914	4	4.263	0.860	3	3.436	0.852	13	20.263	0.000**
A11	Leisure facilities accessibility	3.760	1.053	8	3.907	0.895	10	3.289	1.037	16	4.051	1.099	4	13.523	0.001**
A9	Medical care services accessibility	3.760	1.085	9	3.791	1.206	11	3.395	1.128	14	4.077	0.774	3	6.909	0.032*
A20	Safety performance of housing	3.720	0.995	10	4.070	0.985	9	3.553	0.891	12	3.513	1.023	12	8.232	0.016*
A19	Energy efficiency of housing	3.720	1.061	11	3.605	1.116	17	4.026	0.944	5	3.564	1.071	11	4.677	0.096
A5	Availability of public transport services	3.720	1.161	12	4.140	0.889	7	3.789	1.166	8	3.179	1.233	17	13.176	0.001**
A7	Availability of green public spaces	3.530	1.037	13	3.605	1.094	16	3.105	0.831	19	3.872	1.031	8	12.579	0.002**
A6	Availability of waste management	3.520	0.970	14	3.488	1.032	18	3.211	0.935	18	3.846	0.844	9	8.075	0.018*
A18	House appearance	3.490	1.174	15	3.791	1.166	12	3.342	1.146	15	3.308	1.173	16	5.403	0.067
A4	Availability of incentives	3.440	0.933	16	3.698	0.964	13	3.474	0.830	13	3.128	0.923	18	7.008	0.030*
A14	Maintainability of housing	3.430	0.923	17	3.674	0.892	15	3.263	0.921	17	3.333	0.927	14	5.476	0.065

Table 4.8: Mean and Ranking on Housing Preferences based on Demographic Factors (Income Groups) (Cont'd)

Ref	Housing Preferences	Overall (N = 120)			< RM 4,849 (B40) (N = 43)			RM 4,850 - RM 10,960 (M40) (N = 38)			> RM 10,961 (H20) (N = 39)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
A10	Education services accessibility	3.310	1.413	18	3.163	1.479	20	3.763	1.149	9	3.026	1.495	19	5.019	0.081
A8	Employment opportunities accessibility	3.300	1.424	19	3.698	1.282	14	3.737	1.267	10	2.436	1.353	20	20.749	0.000**
A15	Tenure Security	3.280	1.037	20	3.465	1.077	19	3.026	1.000	20	3.308	1.004	15	3.331	0.189

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant

4.6.3 Strategic Measures to reduce Affordable Housing Gap

Table 4.9 and 4.10 manifested the mean and ranking on strategic measures to reduce affordable housing gap. Overall, the top five most effective tactics rated by respondents are mitigate rejection of housing loans from bank, reduce the construction cost for affordable housing, provide housing schemes, enhance rental market to rehabilitate housing balance and enhance financial literacy of homebuyers with mean value of 3.792, 3.783, 3.750, 3.592 and 3.467, accordingly:

- (1) Mitigate rejection of housing loans from bank (Mean = 3.792; δ = 0.969)
- (2) Reduce the construction cost for affordable housing (Mean = 3.783; δ = 1.006)
- (3) Provide housing schemes (Mean = 3.750; δ = 0.946)
- (4) Enhance rental market to rehabilitate housing balance (Mean = 3.592; δ = 1.081)
- (5) Enhance financial literacy of homebuyers (Mean = 3.467; δ = 1.076)

Finding studies by Ebekozen, Abdul-Aziz and Jaafar (2019c), concerning the housing loans inaccessibility to homebuyers in Malaysia, especially low income earners such as B40, who ascertained that high rate rejection of housing loans by bank institutions is an encumbrance across the globe. Moreover, they also mentioned that this issue of assessing housing loans has been always there lingering since the mid-1990s in Malaysia where more than 70% of homebuyers get rejected from the bank even though some of them have been certified as eligible house buyers. This is worrisome as the housing loans rejection rate has remained high although there are various low cost housing programmes advocated by the governments. This fact is that, to some extent, Sufian and Ibrahim (2011) have identified a few possible causes of refusal housing loan application such as unfavourable credit scores, bad reputation in Central Credit Reference Information System (CCRIS), debt service ratio exceeded, employment history and insufficient income of applicants. By tackling this issue, Cheah, Almeida and Ho (2017) proclaimed that Bank Negara Malaysia (BNM) has the responsibility to curb this matter by

mitigating lending restrictions and credit check. This is very much aligned with the research by Yap and Ng (2018) and Alaghbari, et al. (2011), who stated that alleviating restriction of housing loan application by banks can be an ideal resolution to reduce the affordable housing gap. As such, the government and bank should set up easy application of housing loan schemes, rent-to-own schemes and down payment for home buyers in order to reduce their financial burden in owning a house as well as bridging the gap of demand-supply of affordable housing. Overall, mitigate rejection of housing loans from bank is the most effective tactic ranked by respondents in this study as this method can help them to reduce their financial burden.

Apart from that, the second highest rank of strategies is to reduce the construction cost for affordable housing with an overall mean value of 3.783. According to Cheah, Almeida and Ho (2017), costs for compliance, labours, land and building materials can reach up to 80 percent of housing price which is difficult to achieve an affordable level for housing. Apparently, it is imperative to alleviate the construction costs so that housing price can be reduced to an affordable level. This statement has coincided with research in Saudi Arabia undertaken by Sadi A., Abdulaziz A. and Fawaz (2010), who asserted that mitigating the cost of construction in affordable housing can be an impressive policy action in development of affordable housing. Additionally, he has also ascertained that the high cost of affordable housing may be due to few factors such as availability of housing lands, labour supplies, building costs, land costs and municipal issues. On the other side, Ganiyu, Fapohunda and Haldenwang (2017) also starkly highlighted that cost of construction materials are getting expensive nowadays such as timber, steel and cement which has led to the increment of price for housing projects. As a consequence, the project stakeholders have lost interested in building affordable housing with a tight budget. Pursuant to a study in India by Raj, et al. (2020), adopting local skills, technology and resources can help in mitigating the construction costs. For instance, shipping expenses will be lower if using local resources. From the perspective of Bank Negara Malaysia, adoption of Industrialised Building System (IBS) is an ideal technique in the construction industry as it can ameliorate the efficiency of the building works which can help in lowering the construction costs as well as shorten the

delivery period and lesser wastage (Cheah, Almeida and Ho, 2017). On top of that, Ebekoziem, Abdul-Aziz and Jaafar (2020a) mentioned that one of the potential tactics to resolve high construction costs is that the government needs to waive all the taxes on affordable housing and subsidise lands to developers. By doing so, developers will be interested to engage in development of affordable housing. As a whole, alleviating construction cost on housing affordable is truly an effective measure to bridge the gap of affordable housing.

As aforementioned, affordability measures usually emphasize the financial burden of households. Therefore, providing housing schemes is undoubtedly effective to lighten the financial burden of households. In Malaysia, the government has advocated few housing schemes such as “My First Home Scheme”, “1 Malaysia People’s Housing Scheme (PR1MA), Home Ownership Campaign and others (Cheah, Almeida and Ho, 2017). All these housing schemes are beneficial to Malaysians who want to purchase an affordable house, especially young people, B40 and M40. In order to satisfy the demand, Yap and Ng (2018) also suggested that the government needs to propose more housing schemes to make houses more affordable in Malaysia. Meanwhile, this action is able to motivate and inspire developers in developing affordable homes which has achieved killing two birds with one stone. Therefore, providing housing schemes is reasonably to be ranked in third place in this survey.

Nevertheless, it was intriguing that “enhance rental market to rehabilitate housing balance” and “enhance financial literacy of homebuyers” have been ranked in top five most effective strategic measures. This is because the top three variables are all dealing with financial issues, while both of these variables are not related to financial attributes. However, they are more prone to areas of knowledge and market condition. Finding agree with Samad, et al. (2016), Sard and Waller (2002) and Cheah, Almeida and Ho (2017), who concurred that enhancing the rental market is one of the effective ways to tackle the issue of affordable housing gap. Nonetheless, due to the problems of poor legal safeguards and slow dispute solution process of tenant-landlords, most Malaysians prefer to purchase a house instead of renting. Subsequently, Residential Tenancy Act has offered legal safeguards for landlords in order to

boost up the rental market (Sard and Waller, 2002). Since rental housing requires low capital cost, maintenance cost and operation cost, hence, renting a house is much affordable than buying a house and able to mitigate financial burden of households concurrently.

Last but not least, having knowledge on financial matters is also crucial to solve the affordable housing gap. In particular, housing bubbles will be incurred due to poor financial literacy (Development and Platform, 2019). According to the statistics from Bank Negara Malaysia, more than 75% of Malaysians cannot withdraw RM1,000 when an emergency happens, whereas this has proved that the level of financial literacy in Malaysia is poor. Accordingly, education on financial matters is necessary and cannot be neglected by everyone. With the intention of ameliorating the financial literacy in Malaysia, Bank Negara Malaysia has proposed Credit Counselling and Debt Management Agency (AKPK) to assist and give advice to homebuyers before purchasing a house (Cheah, Almeida and Ho, 2017). In this manner, the issue of affordable housing can be tackled adequately and effectively.

Table 4.9: Mean and Ranking on Strategic Measures to reduce Affordable Housing Gap (Generation Cohorts)

Ref	Strategic measures	Overall (N = 120)			18 - 38 years old (Generation Y) (N = 44)			39 - 59 years old (Generation X) (N = 41)			60 years or older (Baby Boomers) (N = 35)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
C2	Mitigate rejection of housing loans from bank	3.792	0.969	1	3.886	1.017	3	3.805	1.005	1	3.657	0.873	2	1.776	0.411
C4	Reduce the construction cost for affordable housing	3.783	1.006	2	3.773	1.054	6	3.756	1.019	2	3.829	0.954	1	0.067	0.967
C9	Provide housing schemes	3.750	0.946	3	4.045	0.861	1	3.732	0.923	3	3.400	0.976	3	9.042	0.011*
C10	Enhance rental market to rehabilitate housing balance	3.592	1.081	4	3.750	0.991	7	3.585	1.161	4	3.400	1.090	4	1.825	0.401
C8	Enhance financial literacy of homebuyers	3.467	1.076	5	3.955	0.963	2	3.341	1.087	6	3.000	0.970	7	16.186	0.000**
C6	Financial incentive for construction of affordable housing	3.442	1.002	6	3.864	0.955	4	3.341	1.015	5	3.029	0.857	6	15.612	0.000**
C3	Determine eligibility of homebuyers	3.433	1.059	7	3.795	1.025	5	3.195	1.054	7	3.257	1.010	5	8.822	0.012*
C1	Centralise initiatives of affordable housing	3.233	1.075	8	3.705	0.878	8	3.073	1.149	8	2.829	1.014	8	16.767	0.000**
C5	Implementation of cumulative ruling policy	2.792	1.068	9	3.205	1.025	9	2.634	1.135	10	2.457	0.886	9	10.661	0.005**
C7	Implementation of joint task force	2.692	1.052	10	3.114	0.993	10	2.707	1.078	9	2.143	0.845	10	17.839	0.000**

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant.

Table 4.10: Mean and Ranking on Strategic Measures to reduce Affordable Housing Gap (Income Group)

Ref	Strategic measures	Overall (N = 120)			< RM 4,849 (B40) (N = 43)			RM 4,850 - RM 10,960 (M40) (N = 38)			> RM 10,961 (H20) (N = 39)			Kruskal Wallis	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi square	Asymp. Sg.
C2	Mitigate rejection of housing loans from bank	3.792	0.969	1	3.953	0.999	2	3.763	0.971	1	3.641	0.932	3	2.792	0.248
C4	Reduce the construction cost for affordable housing	3.783	1.006	2	3.860	0.941	3	3.684	1.188	2	3.795	0.894	1	0.178	0.915
C9	Provide housing schemes	3.750	0.946	3	4.000	0.951	1	3.474	1.033	4	3.744	0.785	2	5.731	0.057
C10	Enhance rental market to rehabilitate housing balance	3.592	1.081	4	3.791	1.081	6	3.579	1.081	3	3.385	1.067	4	2.792	0.248
C8	Enhance financial literacy of homebuyers	3.467	1.076	5	3.860	0.966	4	3.368	1.025	5	3.128	1.128	7	9.563	0.008**
C6	Financial incentive for construction of affordable housing	3.442	1.002	6	3.814	1.006	5	3.132	1.018	8	3.333	0.869	5	10.151	0.006**
C3	Determine eligibility of homebuyers	3.433	1.059	7	3.791	1.059	7	3.158	1.079	6	3.308	0.950	6	8.089	0.018*
C1	Centralise initiatives of affordable housing	3.233	1.075	8	3.651	1.021	8	3.158	1.079	7	2.846	0.988	8	11.186	0.004**
C5	Implementation of cumulative ruling policy	2.792	1.068	9	3.186	1.097	9	2.632	0.883	9	2.513	1.097	9	7.827	0.020*
C7	Implementation of joint task force	2.692	1.052	10	3.163	1.045	10	2.526	0.862	10	2.333	1.060	10	12.498	0.002**

Note: ** The mean different is significant at the 0.01 level of significant.

* The mean different is significant at the 0.05 level of significant.

4.7 Kruskal-Wallis Test

Kruskal-Wallis test was adopted in this study through SPSS in order to figure out if there are any significant differences in perceptions of different respondent groups based on age group and income group. According to Theodorsson-Norheim (1986), Kruskal-Wallis test is a non-parametric one way analysis of variance (ANOVA), and there will be two hypotheses generated which is classified as:

1. Null hypotheses (H₀); there is no significant difference between groups.
2. Alternative hypothesis (H₁); there is significant difference between groups.

Furthermore, if the p value is less than or equal to 0.05 which supports the alternative at 95% of confidence level, the null hypothesis could be rejected, signifying that there were significant differences in the mean ratings between groups (Ostertagová, Ostertag and Kováč, 2014).

4.7.1 Influential Factors of Sustainable Housing Affordability

Kruskal-Wallis test is adopted to compare the respondent groups according to generation cohorts and income groups for their opinions towards the 20 critical factors influencing sustainable housing affordability in Malaysia.

Table 4.5 revealed the result of Kruskal-Wallis test based on three different generation cohorts (generation Y, generation X and baby boomers), whereas 5 out of 20 factors were having statistically significant differences ($r < 0.05$), which are “availability of incentives”, “shops accessibility”, “tenure security”, “leisure facilities accessibility” and “house appearance”. It was not surprising to discover that different generations have distinct perspectives as changes of opinions will occur in different stages of life (Preece, et al., 2020). For instance, the most noticeable significant difference is “availability of incentives” where only generation Y (18-38 years old) rated this factor above 4.00. This is due to the fact that young households are more likely to undergo financial burden as compared to others (Bujang, et al., 2017). Incentives such as deposit assistance, stamp duty exemptions and housing schemes are essential for young-aged home buyers in order to lighten their financial stress. As a consequence, this factor is imperative from the perception of generation Y towards influential factors of sustainable housing affordability.

As for the perceptions of the respondents based on the three distinct income groups as manifested in Table 4.6, the results revealed that among the total of 20 influential factors, 14 of them were having significant differences ($r < 0.05$) which signified the null hypotheses are rejected at 95% of confidence level. In fact, it was quite interesting to notice the massive difference between the opinions of three different income groups, especially the variable of “shops accessibility” and “environmental problems”. As presented in Table 4.6, group B40 has ranked “shops accessibility” as sixth with the largest mean value of 4.163 which signified that this factor has the highest significant differences compared to the other groups. Meanwhile, group M40 and H20 ranked the same factor as eleventh (3.316) and tenth (3.564) accordingly. Purchasing daily supplies is essential for everyone, which is commonly only available in retail shops. With poor access to shops, high commuting costs will be incurred due to longer travel distance, which has a significant impact on household income. Hence, poor shops accessibility tends to add further financial burden to households, especially for low income groups (B40). Hence, low income households are reluctant to stay in areas with poor accessibility to shops and public transport as this will lead to living inconvenience (Wang and Li, 2006). On top of that, most of the low income households could not afford a private vehicle and thus poor accessibility not only affected households’ quality of life, but also their survival chances. Nevertheless, group M40 and H20 are more willing to stay further compared to group B40 since they can afford private vehicles (Zeng, Rees and Xiang, 2019). In this manner, group B40 is more concerned about shops accessibility for sustainable housing affordability.

Regarding the “environmental problems”, there was a significant difference in the opinions amongst income groups. As manifested in the Table 4.6, group H20 has ranked this variable higher than group B40 and M40. This may owe to the fact that group H20 is more worried about environmental issues such as water and air pollution since these will affect their health. As such, high income households are willing to pay more for a clean housing area (Beamish, Goss and Emmel, 2001).

4.7.2 Housing Preferences

Aside from influential factors of sustainable housing affordability, Kruskal-Wallis test is also adopted to compare the perceptions of respondent groups based on generation cohorts and income groups towards housing preferences. Intriguingly, there is a massive difference towards housing preferences from the respondents since housing satisfaction increases with age (Yap, Yong and Skitmore, 2019). As presented in Table 4.7, there are a total of 14 factors showing significant difference ($r < 0.05$) amongst generation cohorts. Similarly in income groups, Kruskal-Wallis test revealed that 12 out of 20 housing preferences were having statistically significant differences.

As for the generation cohorts, “availability of mortgage and interest rate”, “leisure facilities accessibility”, “medical care services accessibility”, “education services accessibility” and employment opportunities accessibility” were having an enormous difference as compared to the other variables. It was not amazed to notice that “availability of interest rate” was ranked low by baby boomers, whereas generation Y and X perceived the same variable as one of the top five most significant housing preferences. Since mortgage loans tenures can normally reach up to 35 years, therefore, most lenders are sceptical to permit the loan if the borrower exceeded the desirable age limit. In other words, it is hard to apply for a housing loan at the age of 60 or older as they may be incapable to pay off their mortgage loans. Such circumstances have led to high borrowing risk to baby boomers and subsequently they are less concerned about availability of mortgage and interest rates. As such, most elderly people did not considered mortgage loan as a refinancing tool (Lee and Ahn, 2013).

Nevertheless, there is also a significant difference where baby boomers perceived that “leisure facilities accessibility” and “medical care services accessibility” are important considerations, whilst generation Y and X have ranked low for both of these variables. This is due to the fact that most of the baby boomers are at their retirement stage which have more time to access leisure facilities such as swimming pools, museums, libraries and many others in order to ameliorate their quality of life and create a healthy lifestyle (Mulliner and Maliene, 2011). Moreover, medical care service is a basic

necessity for every human being and everyone has the right to live adequately for good health (Tavakoli, Tafrishi and Abbaspour, 2017). Generally, there will be greater demand for medical care by baby boomers since they have crossed into old age. In light of this, it is not surprising that baby boomers have different opinions in this factor where they ranked it higher than the other generation cohorts.

Furthermore, “education services accessibility” has been ranked high with a sample mean of 4.098 by generation X. Nonetheless, generation Y and baby boomers ranked the same factor as second last and last housing preferences. In this survey, most respondents from the age group of 39-59 years old (generation X) were married and living with their kids. For this reason, they are more concerned about education services for their next generation (Li and Liu, 2016). On the other hand, there is also a noticeable difference for the variable of “employment opportunities accessibility” where baby boomers perceived it as least important housing preferences. Conversely, generation Y viewed it as one of the top 10 important considerations. Such results were reasonable as the majority of the young people were just about to enter the labour market, while baby boomers were at their retirement stage.

In terms of income groups, more than half of the variables have significant differences in the perception of the three distinct income groups towards housing preferences. Nevertheless, “housing price in relation to income”, “leisure facilities accessibility”, “medical care services accessibility” and “availability of transport services” were having a massive difference as compared to others. Intriguingly, group H20 has different thoughts from other income groups towards “housing price in relation to income”. As presented in Table 4.11, the sample mean for group H20 is below 4.00 while the sample means from other groups were above 4.00. This has indicated that group H20 were less likely to worry about housing prices since the financial ability of group H20 allows them to purchase properties with higher price and less restriction in terms of pricing (Soon and Tan, 2019), as compared to low and middle income groups. In contrast, they were more concerned about accessibility problems such as “leisure facilities accessibility” and “medical

services accessibility” which are totally different perceptions from group B40 and M40 based on the mean value.

Last but not least, “availability of public transport services” is also found statistically different across the opinion of group B40, M40 and H20. According to mean ranking, only group H20 rank “availability of public transport services” as 17th place while both group B40 and M40 rank it as one of the top ten significant housing preferences. It is a remarkable fact that most of the high income households can afford their private cars and thus they are less concerned about public transport services. However, from the perspectives of low and middle income households, they rely more on public transportations since most of them could not afford private vehicles. With poor availability of public transport, they may experience high commuting costs which will directly affect their income (Isalou, Litman and Shahmoradi, 2014).

4.7.3 Strategic Measures to Reduce Affordable Housing Gap

In terms of strategic measures to reduce the affordable housing gap, 10 strategies have been tested by using Kruskal-Wallis test and it showed that there are significant differences in the perceptions of three distinct generation cohorts and income groups. Table 4.9 showed 7 factors have a significant difference with three distinct generation cohorts, whereas Table 4.10 illustrated the notable differences of 6 factors in different income groups. Particularly, the massive difference in variables for generation cohorts are “provide housing schemes” and “enhance financial literacy of homebuyers”. As for income groups, “enhance financial literacy of homebuyers” was detected for a huge difference in the opinions of the respondents.

There is a noticeable difference in the perception of generation Y towards providing housing schemes, where the mean value was listed above 4.00, whilst other groups were below 4.00. As aforesaid, affordability measures usually focus on the financial burden of households and providing housing schemes is undeniably effective to mitigate the financial stress of households. As such, the government in Malaysia has promoted a few housing schemes such as “My First Home Scheme”, “1 Malaysia People’s Housing Scheme (PR1MA), Home Ownership Campaign and others (Cheah, Almeida

and Ho, 2017), which is very beneficial to first home buyers. Generally, the majority of the first home buyers are young people, namely generation Y.

Aside from housing schemes, “enhance financial literacy of homebuyers” also showed a significant difference in the perception of respondents across generation cohorts and income groups. Based on the statistics from Bank Negara, most Malaysians could not withdraw RM1,000 to deal with emergency issues. Such circumstances indicated that the level of financial literacy amongst Malaysians is poor (Cheah, Almeida and Ho, 2017). Accordingly, generation Y has ranked this variable as the second most effective strategy as they perceive that financial knowledge is necessary to them since they are new to the housing market. As for the income groups, group B40 have perceived it as the most effective tactic amongst other income groups. By improving financial literacy, they can equip themselves with skills and knowledge of finance in order to manage their money effectively.

4.8 Factor Analysis

Factor analysis is the most widely used multivariate technique that aims to provide an overview amongst numerous correlated variables to examine and turn them into a much fewer underlying components (Sapsford and Jupp, 2006; Doloi, et al., 2012). In other words, it is implied for data summarisation and data reduction (Kothari, 2004). In this study, factor analysis was applied to investigate the prime groupings of 20 influential factors of sustainable housing affordability in Malaysia.

4.8.1 Analysis Considerations

Kaiser-Meyer-Olkin (KMO) and Bartlett’s test of sphericity are implemented in this research to measure the adequacy of data prior to the application of factor analysis (Doloi, et al., 2012). The results of KMO and Bartlett’s tests are illustrated in Table 4.11.

Table 4.11: Results of KMO and Bartlett's Tests

Parameter	Value
Kaiser-Meyer-Olkin measure of sampling adequacy	0.831
Bartlett's test of sphericity	
Approximate chi-square	1030.344
Degree of freedom	190
Significance	0.000

As shown in Table 4.11, the KMO value for the 20 influential factors is 0.831. According to Kothari (2004), a recommended value of 0.50 is suggested for KMO value, and thus, 0.831 is deemed decent for this research. Moreover, Bartlett's test of sphericity is 1030.344 with a significant value of 0.000, which signifies that the variables were sufficiently interrelated and the underlying factors were able to be determined. Accordingly, suitability of adoption of factor analysis has been validated in this research (Ye, et al., 2015).

Regarding the determination of the number of underlying factors for 20 factors affecting sustainable housing affordability in Malaysia, both percentage of variance and eigenvalues techniques were applied in this analysis. Besides, the principal component analysis (PCA) generated 5 factors with eigenvalues more than 1.0 which have revealed in Table 4.12. Apart from that, the scree plot in figure 4.1 denoted the 20 factors were examined and 5 major factors were extracted. Besides, Table 4.12 also represents the outcomes of the total variance explained. With a total cumulative variance of 63.10%, this result has validated the reliability of the factor outcomes in this study. This may owe to the fact that the extracted variance should be equal or greater than 60.00% for reliable results, only if the analysis contains less than 30 items (Kothari, 2004). Apart from that, Table 4.13 recapitulated the five underlying factors with the variance explained in percentage and factor loading for each attribute.

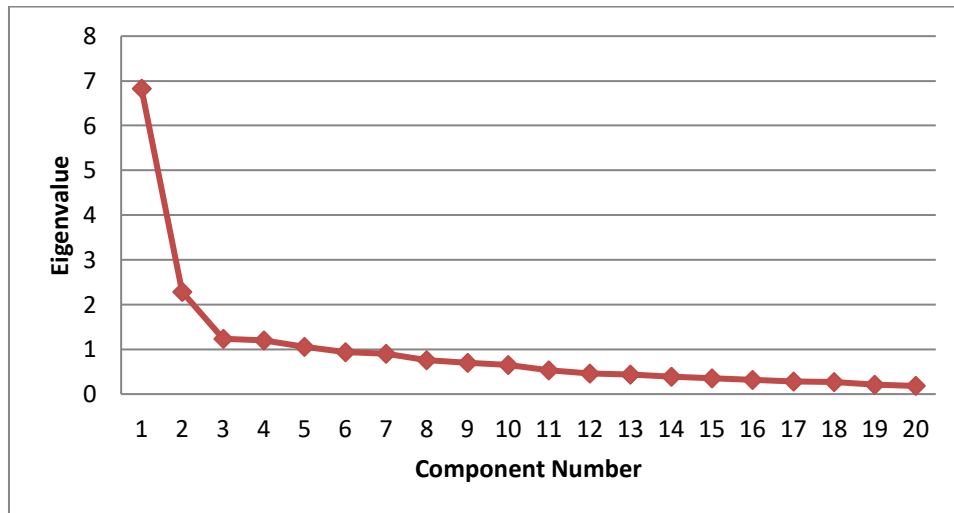


Figure 4.1: Scree Plot for 20 Items

Table 4.12: Total Variance Explained

	Initial Eigenvalues		
	Total	Percentage of Variance	Cumulative (%)
F1	6.829	34.146	34.146
F2	2.289	11.447	45.593
F3	1.236	6.182	51.775
F4	1.195	5.976	57.751
F5	1.061	5.304	63.055

Table 4.13: Factors Profile of Influential Factors of Sustainable Housing
Affordability in Malaysia

Details of Underlying Factors		Factor Loading	Variance Explained (%)
<i>Factor 1: Values and lifestyles</i>			18.773
A11	Leisure facilities accessibility	0.733	
A10	Education services accessibility	0.675	
A18	House appearance	0.674	
A12	Shops accessibility	0.653	
A9	Medical care services accessibility	0.647	
A4	Availability of incentives	0.647	
<i>Factor 2: Safety and satisfaction</i>			13.337
A14	Maintainability of housing	0.710	
A16	Crime rate	0.658	
A20	Safety performance of housing	0.570	
A15	Tenure security	0.562	
A13	Quality performance of housing	0.553	
<i>Factor 3: Economic sustainability</i>			11.651
A2	Rental price in relation to income	0.822	
A1	Housing price in relation to income	0.807	
A3	Availability of mortgage and interest rate	0.439	
<i>Factor 4: Environmental</i>			10.252
A7	Availability of green public spaces	0.687	
A6	Availability of waste management	0.655	
A19	Energy efficiency of housing	0.478	
A17	Environmental problems	0.453	
<i>Factor 5: Accessibility</i>			9.042
A5	Availability of public transport services	0.761	
A8	Employment opportunities accessibility	0.672	
Cumulative variance explained			63.055

4.8.2 Extraction of Underlying Factors

Factor 1: Values and lifestyles

This factor accounts for 18.773% for total variance explained and comprises leisure facilities accessibility, education services accessibility, housing

appearance, shops accessibility, medical care services accessibility and availability of incentives.

Lifestyle is normally affected by demographic characteristics of households. For instance, generational cohort, income level, household size, education level, occupation, presence of children and marital status, which these factors will impact one's lifestyle. Moreover, lifestyle is also affected by the households' perceived values, whereas value of housing can be determined by the location and aesthetic of the property (Beamish, Goss and Emmel, 2001). In terms of leisure facilities accessibilities, it was attributed to a rising desire for luxury lifestyles (Arman, et al., 2009). With easy access to leisure facilities, households can spend their leisure time in facilities such as museums, libraries, swimming pools and others. Hence, these activities not only can create a healthy lifestyle for households, but also can ameliorate their quality of life (Mulliner and Maliene, 2011). On the other side, education services accessibility can also add value to housing development as sustainable housing demands good access to educational services (Isalou, Litman and Shahmoradi, 2014). To be specific, easy access to schools can influence one's future by enhancing their knowledge and increasing the opportunities for upward social mobility (Zeng, Rees and Xiang, 2019). Regarding housing appearance, it is the first feature that will be noticed by home buyers when they purchase their house. According to a Swedish research, homebuyers are more attracted to the aesthetic aspects of housing (Opoku and Abdul-muhmin, 2010), which is similar to home buyers in China who favoured an aesthetically housing appearance (Wu, 2010). As such, housing appearance is one of the influential factors for sustainable housing affordability and can enhance the value of the house (Chan and Adabre, 2019).

Factor 2: Safety and satisfaction

Aside from value and lifestyles, the second factor is safety and satisfaction with 13.337% of total variance explained. This underlying factor is characterized by five components which are "maintainability of housing", "crime rate", "safety performance of housing", "safety performance of housing", "tenure security" and "quality performance of housing" with the factor loading of 0.710, 0.658, 0.570, 0.562 and 0.553 respectively.

Fulfilling household satisfaction is very fundamental in order to achieve sustainable housing affordability. Household satisfaction can be described as an evaluation of the degree to which the quality of housing and its environment are close to their favoured one. Therefore, ease of housing maintenance and safety performance of housing and neighbourhood are related to household satisfaction (Chan and Adabre, 2019). To be more precise, the association among these components is coherent as they assess the same factor which is safety and satisfaction of households. Chan and Adabre (2019) also asserted that maintainability of housing can secure household satisfaction as ease of maintenance and low cost maintenance of housing were determined as contributory parameters for household satisfaction.

On the other hand, Kam, et al. (2018) highlighted that housing areas with high crime rates have triggered an alert for homebuyers, and thus, they are reluctant to buy a house in that area. Tan (2013) also figured out that first time homebuyers are more likely to live in gated and guarded communities due to safety considerations. Besides, Chan and Adabre (2019) also further explained that crime rate in the neighbourhood will have a direct impact on residential satisfaction and home buyer's decisions to purchase a house.

In terms of safety performance of housing, it is undeniable that development of housing not only gives structures to stay in, but also needs to consider other aspects such as safety. In Malaysia, many cases have proven that the failure to achieve the objectives in low cost housing in terms of safety aspects in the building. With poor quality construction, it will affect the total safety performance of housing, whereas quality of housing is also highly associated with safety performance of housing (Husin, et al., 2011).

Factor 3: Economic sustainability

Typically, economic sustainability has always drawn much attention to affordable housing projects (Gan, et al., 2017). Under factor of economic sustainability with 11.651% of the total variance explained, there are a total of three components which are “rental price in relation to income”, “housing price in relation to income” and “availability of mortgage and interest rate”, with factor loadings of 0.822, 0.807 and 0.439, respectively.

One of the considerations of achieving sustainability is related to economic (Arman, et al., 2009). According to Wang, Jung and Lim (2012), who asserted that economic sustainability can be described as “continuous and indefinitely sustained growth”. The inequality of housing price or rental price and household income has caused the housing market to be severely unaffordable for most Malaysians. Furthermore, Soon and Tan (2019) also stressed that the affordability problem can be exacerbated if the housing or rental price continues growing rapidly than household income. Apart from that, Mulliner and Maliene (2011) prescribed that housing prices and rental costs in relation to income are categorised under economic sustainability which are the prime determinant of housing affordability. In addition, they also conducted a survey which showed that financial attributes perceived as the most important factor to sustainable housing affordability. In general, affordability assessment emphasised on the economic burden of housing price such as house costs or rental costs to household income ratio technique (Mulliner, Malys and Maliene, 2016).

In terms of mortgage and interest rates, it has a significant influence on a household’s affordability to buy a house. This is because housing only can be known as affordable when the home buyers can afford the ongoing costs of the house (Gan, et al., 2017). Nevertheless, most of the first time home buyers in Malaysia are facing difficulties in applying for a mortgage loan due to the strict rules set by banks (Soon and Tan, 2019). In the same vein, availability of mortgage and interest rate, housing and rental costs in relation to income were perceived as critical factors affecting sustainable housing affordability. Also, these three variables are germane to gauge the economic sustainability of housing. Chan and Adabre (2019) also further explained that most households prioritised on financial attributes when it comes to affordability.

Factor 4: Environmental

The “environmental” factor consists of “availability of green public spaces”, “availability of waste management”, “energy efficiency of housing” and “environmental problems”, which accounts for 10.252% of the total variance explained amongst all influential factors illustrated in Table 4.13. A “true” concept of housing affordability is not simply about financial criteria, but also

needs to link with environmental sustainability (Mulliner and Maliene, 2015). However, there is a misconception where housing affordability is normally measured on a cost basis, and thus, environmental sustainability is not inevitably consistent with housing affordability due to the consideration of environmental sustainability in affordable housing will possibly increase the capital cost. Therefore, this misconception resulted in rare consideration of environmental sustainability as a method to achieve affordability (Gan, et al., 2017). Tavakoli, Tafrihi and Abbaspour (2017) also combated that environmental perspectives should be taken into consideration in determining housing affordability as environmental sustainability is one of the main three pillars of sustainability. Similarly, Chan and Adabre (2019) also further elaborated that environmental factors can crucially affect the evaluation of the affordability in housing areas.

Availability of green public spaces is unambiguously one of the core criteria of achieving environmental sustainability, owning the highest factor loading of 0.687 among other components under factor 4. Gan, et al. (2017) proclaimed that accessing green public spaces have a direct beneficial influence on the well-being and health of households, which is able to constitute a recreation, relaxation and healthy living environment. Nevertheless, this matter is usually overlooked in affordable housing programmes. Moreover, Zhou and Rana (2012) also indicated that public green spaces can act as air pollution purifiers, as well as store rainwater that contributes positively to environmental sustainability.

Aside from that, availability of waste management is one of the prerequisites for households to be taken as priority in order to create a sustainable housing environment. In Malaysia, the housing area is one of the greatest sources of urban waste since waste management is minimal in certain areas (Moh and Abd Manaf, 2014). This might be due to the fact that investors are always focused on profit maximisation and neglected the problem of housing environment sustainability in terms of waste management. Hence, households may dump their waste indiscriminately which forms a hazard to human health and unpleasantness to the aesthetic of the living environment (Mulliner, Smallbone and Maliene, 2013). With proper waste management

planning for affordable housing, a sustainable housing environment can be ameliorated (Gan, et al., 2017).

Furthermore, energy efficiency of housing such as installation of water-efficient equipment, energy-efficient lighting system and heating, ventilation and air conditioning system (HVAC), solar system and rainwater harvesting system can be implemented in affordable housing projects in order to achieve environmental sustainability goals. According to Chan and Adabre (2019), the crucial principle of energy efficiency of housing is not only able to minimize the energy costs, but also is a key strategy to abating the environment effects such as greenhouse effects. This has coincided with the study undertaken by Tavakoli, Tafrihi and Abbaspour (2017), who asserted that adoption of energy efficient technologies can achieve sustainability in affordable housing.

Last but foremost, “environmental problem” has achieved a factor loading of 0.453. Traffic congestion, noise pollution and air pollution are considered as environmental problems which not only affect households’ health, but also bring negative effects to the housing environment (Tan, 2013). In short, all these components were related to environmental sustainability and therefore they have been named as “environmental factors”.

Factor 5: Accessibility

Factor 5 accounted for 9.04% of the total variance explained and is one of the prime factors affecting the sustainable housing affordability. As is well known, gauging and conceptualising sustainable housing affordability were emphasised only on monetary attributes and always neglected other issues like accessibility (Mulliner and Maliene, 2015). Moreover, (Chan and Adabre, 2019)also argued that accessibility should be taken into consideration in housing affordability measures, but not merely financial factors. This statement has been supported by other authors Tan (2013) and Mulliner and Maliene (2015), who starkly highlighted that the significance of housing that easy access to public transport services and employment opportunities will have an immediate impact on household income. Basically, accessibility usually has a crucial effect on the choices made by households before purchasing a house (Yap, Yong and Skitmore, 2019).

Houses with easy access to public transport facilities are predominant for home buyers, especially for the low income group and people with disabilities as this can enhance their mobility. Because of poor accessibility of public transportation in some areas, households may face inconvenience to move around and thus, they are more likely to rely on private vehicles (Yap, Yong and Skitmore, 2019). Based on the research of Doloi, et al. (2012), he asserted that the amount of newly registered private vehicles have been growing at an astonishing pace in Malaysia. As a consequence, this situation not only causes traffic congestion, but additional time and commuting cost will also be incurred. Aside from that, previous studies have also mentioned that commuting cost has been overlooked in measuring sustainable housing affordability. To be more precise, some housing prices seem affordable yet might suffer from poor accessibility to amenities and public transport services. Such circumstances constitute high commuting cost to households and subsequently lead to transport poverty (Chan and Adabre, 2019; Tan, 2013). Tan (2013) also expressed that the government should examine the synergy of public transport projects and housing development projects so that affordable housing projects can be constructed nearby public transports.

In terms of employment opportunities accessibility, it is as crucial as public transport services. According to Saidu and Yeom (2020), accessibility for housing is the provision of easy access to transportation infrastructure and job opportunities since a household's income will be directly affected by these factors. On the contrary, poor proximity to job opportunities will lead to excessive commuting time, as well as transportation costs. Therefore, there is an increment of financial burden on households if they stay in affordable housing areas with poor accessibilities. Accordingly, this situation could not be known as sustainable and affordable (Chan and Adabre, 2019). Since these two criteria are related to accessibility, this component was then named as accessibility.

4.9 Summary

In short, the results were generated according to the data collected from 120 respondents with different demographic factors within the Klang Valley area, and have achieved an overall response rate of 47.62%. In terms of data

analysis, Cronbach's alpha reliability test, mean ranking, Kruskal-Wallis test and factor analysis were adopted to test the data through SPSS.

In Cronbach's alpha reliability test, the data obtained from the survey questionnaire has achieved above acceptable levels of Cronbach's alpha that are deemed to be reliable. Meanwhile, the top 5 most agreed critical factors affecting sustainable housing affordability were (1) Housing price in relation to income; (2) Crime rate; (3) Availability of mortgage and interest rate; (4) Rental price in relation to income; (5) Employment opportunities accessibility. On the other hand, crime rate, housing price in relation to income, quality performance of housing, environmental problems and shops accessibility were perceived as first five fundamental housing preferences amongst respondents. Furthermore, the top 5 strategic measures to reduce affordable housing gap were (1) Mitigate rejection of housing loans from bank; (2) Reduce the construction cost for affordable housing; (3) Provide housing schemes; (4) Enhance rental market to rehabilitate housing balance and (5) Enhance financial literacy of homebuyers. For Kruskal-Wallis analysis, this manifested that there were significant differences in perception amongst generational cohorts and income groups on the critical factors affecting sustainable housing affordability, housing preferences and strategic measures to reduce affordable housing gap in Malaysia. Last but not least, factor analysis was carried out and a total of 5 underlying factors were successfully identified and extracted from 20 influential factors of sustainable housing affordability, which are named as values and lifestyles, safety and satisfactions, economic sustainability, environmental and accessibility.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summaries and concludes the findings of the study based on the aim and objectives stated earlier in Chapter 1. Moreover, the implications and limitations of this research were also grimly highlighted and discussed in this chapter. Subsequently, recommendations for further improvement were mentioned at the end of the chapter in order to ameliorate the comprehensiveness of the study towards sustainable housing affordability in Malaysia.

5.2 Conclusion

Housing affordability and sustainability issues are major challenges not only facing in Malaysia, but also across the globe. It is notable that housing affordability has to link with sustainability in order to create sustainable communities and provide high quality of life to households. Nevertheless, the traditional definition of housing affordability was primarily emphasised on financial attributes alone, whilst often neglected other aspects in terms of environmental, social, accessibility and safety. Apparently, it is necessary to review the concept of housing affordability with a new definition of sustainable housing affordability. Particularly, evaluation of housing affordability has to consider more sustainable views of criteria that will affect households' lives such as public transport services accessibility, employment opportunities accessibility, environmental problems and many others. Accordingly, this study focused on the relevant factors contributing to sustainable housing affordability.

This research was carried out to evaluate the perception of respondents on the influential factors of sustainable housing affordability. It is aimed to explore the critical factors to facilitate policymakers in their decision making in order to achieve sustainability affordable housing. As aforementioned, the objectives of this research are: (1) to investigate the critical factors affecting sustainable housing affordability in Malaysia, (2) to determine the relationship

between demographic factors and housing preferences, and (3) to recommend strategic measures to reduce the affordable housing gap in Malaysia.

Moreover, literature review in Chapter 2 has revealed 20 critical factors affecting sustainable housing affordability, housing preferences based on different demographic factors and 10 strategic measures to reduce the affordable housing gap in Malaysia. A total of 120 responses were successfully collected through questionnaire survey and the data tested were reliable by Cronbach's alpha reliability test. Other than that, the established objectives were accomplished and outlined as follows:

Objective 1:

The respondents were requested to rate their level of agreement towards the influential factors of sustainable housing affordability. The results revealed that the top five most significant critical factors of sustainable housing affordability were: (1) Housing price in relation to income; (2) Crime rate; (3) Availability of mortgage and interest rate; (4) Rental price in relation to income; (5) Employment opportunities accessibility. However, in overall, "house appearance" was perceived as the least significant factor by the respondents. Furthermore, there was considerable heterogeneity of views amongst generation cohorts and income groups on factors influencing sustainable housing affordability due to different distinct backgrounds will have different perspectives.

Apart from that, the 20 critical factors influencing sustainable housing affordability were further examined through factor analysis and five underlying factors were extracted. The five underlying factors were known as values and lifestyles, safety and satisfaction, economic sustainability, environmental and accessibility. Subsequently, these manifested underlying factors can provide deeper insights to the government, developers and urban planners in order to ameliorate in the sustainable affordable housing projects.

Objective 2:

Aside from influential factors of sustainable housing affordability, the respondents were also asked to place their level of importance on the 20 factors of housing preferences when buying a house. Since this objective is to

figure out the relationship between housing preferences and demographic factors, the respondents were also requested to fill in their background information such as gender, age group, education level, employment status, income range, marital status and presence of children. However, only generation cohorts and income groups were further discussed in this research since results from these two categories were more interesting. Overall, the five most important housing preferences preferred by respondents are (1) Crime rate, (2) Housing price in relation to income, (3) Quality performance of housing, (4) Environmental problems and (5) Shops accessibility. Meanwhile, tenure security was ranked as the least important preferences amongst respondents. Furthermore, the analysis also revealed that the respondent groups were having homogeneous opinions on housing preferences.

Objective 3:

Finally yet importantly, the policy actions to reduce the affordable housing gap were investigated in this study. The top five most fundamental strategic measures as perceived by respondents are (1) Mitigate rejection of housing loans from bank; (2) Reduce the construction cost for affordable housing; (3) Provide housing schemes; (4) Enhance rental market to rehabilitate housing balance and (5) Enhance financial literacy of homebuyers. Similarly, the analysis also discovered that there were massive differences in perception of the strategic measures to reduce the affordable housing gap by the respondent groups. This might be due to the fact that distinct backgrounds of respondents will have different viewpoints on policy actions.

5.3 Research Implications

In Malaysia, unaffordable housing issues are a pressing concern due to the price spiral of property. Affordable housing is just not simply about cheap; sustainability is very important when purchasing a house.

This research study is imperative as it furnishes a better understanding of sustainable housing affordability, as well as pinpoints the critical factors influencing the sustainable affordable housing and strategic measures to mitigate the affordable housing gap. Through the study conducted, the identified 20 critical factors affecting sustainable housing affordability could

be pivotal interventions to provide insight to government agencies, real estate developers and architects in the development of affordable housing projects. The most significant influential factor that rated by the respondents was housing price in relation to income. In respect of this, the government should advocate more affordable housing projects and encourage developers to be involved in the project. Aside from that, these identified critical factors could also be utilised by policy makers to determine suitable locations for affordable housing projects. As such, resources allocation in the development of sustainable affordable housing can be planned effectively. In the same manner, the established influential factors could be useful to future affordable housing applicants and potential homebuyers in making decision on house purchase. With successful implementation of these influential factors of sustainable affordable housing, a holistic sustainable housing affordability market could be ensured.

Furthermore, it was found that the respondents perceived that mitigate rejection of housing loans from bank as the most effective tactics to alleviate affordable housing crisis. Against this backdrop, the relevant parties should set up housing loan scheme, down payment and rent-to-own scheme which is easier for low income earners to apply so that this can truly protect and assist homebuyers. Additionally, the government and bank should provide subsidies for low income earners who cannot afford to provide down payment and Bank Negara Malaysia should monitor in such situations (Ebekoziem, Abdul-Aziz and Jaafar, 2019a). In other words, bank need to revise and pay more attention to loan applicants for their mortgage lending requirement.

5.4 Limitations of Research

The findings of the research were confronted with various limitations that may thwart the study. Firstly, the sampling in this research was limited as it was only conducted in the Klang Valley area, and thus, this has restricted the generalisation of the findings to represent the entire Malaysia. This stems from the fact that the comprehension on influential factors of sustainable housing affordability in different states within Malaysia might be distinctive. Other than that, due to covid-19 pandemic, paper-based survey was not encouraged; therefore, online surveys were the only ideal channel to distribute

questionnaires. Responses collected from online surveys might be slower than paper-based surveys, but adequate sample size was still achieved in this research. Other than that, although the sample size acquired is 120 responses which is considered adequate, whereas a larger sample size is encouraged in order to generate more reliable results and more representative data.

Aside from that, there will be differences in interpretation and understanding the questions by respondents. To be more precise, respondents may face difficulty grasping the meaning of the questions, therefore, results can be subjective if each respondent has a different understanding. In other words, different levels of comprehension will occur amongst respondents which will affect the reliability and validity of the data collected. Since the Movement Control Order (MCO) announced by the government due to Covid-19 pandemic, face to face discussion is not encouraged. As such, brief explanations for every question in the questionnaire were sent to the respondents via social media platforms such as LinkedIn and email for a better understanding of the questions, as well as to avoid misinterpretation and misunderstanding.

5.5 Recommendations

In Malaysia, most Malaysians are facing similar issues to access the housing market because of the high purchase rate of housing. Consequently, there are real tensions in the policy planning to provide affordable housing, as well as achieve sustainable development. In order to improve the future studies regarding this topic, there are few recommendations to tackle the limitations.

Firstly, the questionnaire surveys are suggested to be distributed across the regions in Malaysia so that the data would be more accurate to represent the whole Malaysia. This has something to do with the fact that Malaysians will have disparity perspectives due to different states and cultures. On top of that, the sample size should be increased to a larger sample size to ameliorate the validity and reliability of the research. On the contrary, small sample size will be hard in determining the significant relationships from the data.

Aside from that, this study provides insights on the influential factors of sustainable affordable housing, housing preferences and recommends some practicable measures to address the perennial problems not only in Malaysia,

but also other developing countries. As such, further researches concerning sustainable housing affordability are recommended to be extended the research geographically as to include other major cities with high rate of urbanisation and population in Malaysia, such as Kota Kinabalu, Johor Bahru, Kuching and so forth. In the same manner, this can help in facilitate affordable housing and sustainable development.

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APPENDICES

APPENDIX A: Questionnaire

ANALYSING THE INFLUENTIAL FACTORS AFFECTING SUSTAINABLE HOUSING AFFORDABILITY IN MALAYSIA

Dear Sir/ Madam,

Sincere greetings and best regards to you.

I am a final year student pursuing Bachelor of Science (Hons) Quantity Surveying in University Tunku Abdul Rahman (UTAR) and currently doing a research on "Analysing the Influential Factors of Sustainable Housing Affordability in Malaysia". The objectives of this study is to investigate the critical factors affecting sustainable housing affordability in Malaysia, determine the relationship between demographic factors and housing preferences and recommend strategic measures to reduce the affordable housing gap in Malaysia.

This questionnaire consists of FOUR (4) sections:

Section A: General Background Information

Section B: Critical Factors Affecting Sustainable Housing Affordability

Section C: Housing Preferences

Section D: Strategic Measures to Reduce the Affordable Housing Gap in Malaysia

The questionnaire is designed to be completed within 5 to 10 minutes. It will be much appreciated if you can answer the following questionnaire regarding this research. All the information collected through this survey will be private and confidential and solely used for academic purpose. Thank you for your participation. Your valuable time and efforts in filling this questionnaire is greatly appreciated. Please do not hesitate to contact me at sinyeethen@gmail.com if you have any enquires.

Yours faithfully,

Then Sin Yee

ANALYSING THE INFLUENTIAL FACTORS AFFECTING SUSTAINABLE HOUSING AFFORDABILITY IN MALAYSIA

Section A: General Background Information

1. What is your gender?
 - Male
 - Female

2. What is your age range?
 - 18 – 38 years old
 - 39 – 59 years old
 - 60 years or older

3. What is the highest level of education you have completed?
 - Postgraduate Degree (Master's Degree/ PhD)
 - Undergraduate Degree (Bachelor's Degree)
 - Diploma
 - High School

4. How would you describe your current employment status?
 - Unemployed
 - Employed
 - Self-employed
 - Retired

5. What is your monthly income range?
 - < RM 4,849
 - RM 4,850 - RM 10,960
 - > RM 10,961

6. What is your current marital status?
 - Single

- Married
 Divorced

7. Do you have any children living with you?

- No
 Yes

Section B: Critical Factors Affecting Sustainable Housing Affordability

In your perspective, to what extent do you agree on the influential factors affecting sustainable housing affordability?

	Influential Factors	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
A1	Housing Price in relation to Income	①	②	③	④	⑤
A2	Rental Price in relation to Income	①	②	③	④	⑤
A3	Availability of Mortgage and Interest Rate	①	②	③	④	⑤
A4	Availability of Incentives	①	②	③	④	⑤
A5	Availability of Public Transport Services	①	②	③	④	⑤
A6	Availability of Waste Management	①	②	③	④	⑤
A7	Availability of Green Public Spaces	①	②	③	④	⑤
A8	Employment Opportunities Accessibility	①	②	③	④	⑤
A9	Medical Care Services Accessibility	①	②	③	④	⑤
A10	Education Services Accessibility	①	②	③	④	⑤
A11	Leisure Facilities	①	②	③	④	⑤

	Accessibility					
A12	Shops Accessibility	①	②	③	④	⑤
A13	Quality Performance of Housing	①	②	③	④	⑤
A14	Maintainability of Housing	①	②	③	④	⑤
A15	Tenure Security	①	②	③	④	⑤
A16	Crime Rate	①	②	③	④	⑤
A17	Environmental Problems	①	②	③	④	⑤
A18	House Appearance	①	②	③	④	⑤
A19	Energy Efficiency of Housing	①	②	③	④	⑤
A20	Safety Performance of Housing	①	②	③	④	⑤

Section C: Housing Preferences

In your point of view, how important of these factors to consider when buying a house?

	Housing Preferences	Not at all	Somewhat important	Moderately important	Quite important	Very important
B1	Housing Price in relation to Income	①	②	③	④	⑤
B2	Rental Price in relation to Income	①	②	③	④	⑤
B3	Availability of Mortgage and Interest Rate	①	②	③	④	⑤
B4	Availability of Incentives	①	②	③	④	⑤
B5	Availability of Public Transport Services	①	②	③	④	⑤
B6	Availability of Waste Management	①	②	③	④	⑤

B7	Availability of Green Public Spaces	①	②	③	④	⑤
B8	Employment Opportunities Accessibility	①	②	③	④	⑤
B9	Medical Care Services Accessibility	①	②	③	④	⑤
B10	Education Services Accessibility	①	②	③	④	⑤
B11	Leisure Facilities Accessibility	①	②	③	④	⑤
B12	Shops Accessibility	①	②	③	④	⑤
B13	Quality Performance of Housing	①	②	③	④	⑤
B14	Maintainability of Housing	①	②	③	④	⑤
B15	Tenure Security	①	②	③	④	⑤
B16	Crime Rate	①	②	③	④	⑤
B17	Environmental Problems	①	②	③	④	⑤
B18	House Appearance	①	②	③	④	⑤
B19	Energy Efficiency of Housing	①	②	③	④	⑤
B20	Safety Performance of Housing	①	②	③	④	⑤

Section D: Strategic Measures to Reduce the Affordable Housing Gap in Malaysia

How effective of these strategies to reduce the affordable housing gap in Malaysia?

	Strategic Measures	Ineffective	Somewhat effective	Effective	Very effective	Extremely effective
C1	Centralise Initiatives of Affordable Housing	①	②	③	④	⑤

C2	Mitigate Rejection of Housing Loans from Bank	①	②	③	④	⑤
C3	Determine Eligibility of Homebuyers	①	②	③	④	⑤
C4	Reduce the Construction Cost for Affordable Housing	①	②	③	④	⑤
C5	Implementation of Cumulative Ruling Policy	①	②	③	④	⑤
C6	Financial Incentive for Construction of Affordable Housing	①	②	③	④	⑤
C7	Implementation of Joint Task Force	①	②	③	④	⑤
C8	Enhance Financial Literacy of Homebuyers	①	②	③	④	⑤
C9	Provide Housing Schemes	①	②	③	④	⑤
C10	Enhance Rental Market to Rehabilitate Housing Balance	①	②	③	④	⑤