



DENSITY CHALLENGES OF HIGH-RISE RESIDENTIAL DEVELOPMENT IN MALAYSIA

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Abstract

Although the term ‘urbanisation’ was first coined in the 19th century, the phenomenon experienced a significant impact and received a lot of attention in the 21st century. One of the major results is density, causing effects such as excessive demand for residential buildings. To cope with the increasing urban population and limited land availability, cities can no longer opt for horizontal development strategies. Going vertical seems a practical solution, but it can lead to convoluted problems if it is not done with proper planning and mitigation measures at the preliminary stages of planning. This article describes the challenges of residential planning density for high-rise development in Malaysia using a systematic literature review on three identified real cases which separated by pre-development, post-development, and development control. The findings show the major challenges in pre-development and post-development related to dissatisfaction with the increasing numbers of high-rise residences due to the increase in population and residential density. As a strategic development control, there must be uniformity in the act or law to control the development of this high-rise residential. Thus, this article led to a better understanding of density related to high-rise residential development in Malaysia.

Keywords: High-Rise Residential, Density, Challenges

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INTRODUCTION

Every human being has a desire to own a house with a multitude of designs and options ranging from house size, land size, number of floors, type of land or high-rise house, location, facilities, and various tastes according to the individual's affordability (Yahya, 1998). However, density is an important measure and factor in planning and development of residential buildings today. Local authorities, planning agencies, and planning departments use density to control, evaluate, and approve development. Developers or landowners always attempt for higher densities which create an adequate return and profitability on their land development. The public often judges projects based on common values about appropriate densities. Anything higher than 'low density' is usually seen as 'too dense'. The question arises: is density measured as dwelling units per acre or floor area ratio, really the important quality of the built environment? (Bergdoll & Williams, 2012).

Given the challenges of urbanisation across many cities, one needs to understand the anatomy of density and the factors that contribute to it. Of all factors, residential stands out on top one due to its importance for safety, comfort, and asset purposes. Dempsey et al. (2012) indicated that residential density affects social sustainability and has a positive influence on local services and facilities provided. The level of sustainability of each city is different. Density is one of the elements of urban appearance that many studies have done and proven to have an influence on the sustainability of neighbourhoods. It is a common language used to indicate objects, such as houses, rooms, people, or units for each space. It is one of the major results of urbanisation, causing effects like excessive demand for housing. Density is the most easily measured element of urban appearance, both at the macro (urban) and micro (neighbourhood) levels (Rani & Shamsuddin, 2013).

To cope with the increasing urban population and limited land availability, cities can no longer opt for horizontal development strategies. Going vertical seems a practical solution, especially when it comes to residential buildings. As urbanisation increases, so does residential density. Therefore, residential density is an important factor to be considered in land use planning. There are many published studies on density by academicians and experts in the industry. The relationship between residential and space density is complex, involving copious dimensions, namely length, width, height, and time measurements (Awad, 2012). These dimensions are rather straightforward, except for the fourth, which is relative according to various factors, such as socio-economics, environment, and governance. It involves two dimensions, namely length and width, the third dimension is height, while the fourth dimension is the type of density measurement that contains various components related to residents and houses. These dimensions can be used as a planning tool at the beginning of the project and to evaluate the results (outcomes) when completed.

There is also a correlation between residential density and the choice of appropriate house types. Residential density can be described in various ways to meet different needs in urban planning, as mentioned by Keeble (1969), who stated that there never existed or there is a method of measurement and control of residential density that can meet all needs or purposes, and still has not been produced to date (Awad, 2012).

Therefore, even though there were various density terms used by past researchers, there is lack of research, specifically on residential density in Malaysia but related research on density was done by Rani (2014). She explained that Malaysia, as a developing country, has notably increased population density in most of its main cities, including Kuala Lumpur. The following table is used by the majority of local councils or local planning agencies in Malaysia for density classification in the development intensity plan, i.e., the Local Plan. In comparison to cities in the United Kingdom, a residential building in Malaysia with a minimum density of 30 homes per hectare would be considered low density. As a result, Malaysia's cultural dimension of density might be classified as moderate. Thus, this article describes the challenges of residential planning density for high-rise development in Malaysia.

RESEARCH BACKGROUND

Concept and Measurement of Density

Malaysia is one of the developing countries with a well-organised population. Malaysia's population is predicted to be 32.7 million, with an annual growth rate of 0.2 percent, according to the Malaysian Department of Statistics (2021). The population density in Malaysia is 99 persons per square kilometre on average, with the Federal Territory of Kuala Lumpur having the highest density at 7,188 people per square kilometre. PLANMalaysia and local authorities are the bodies responsible of regulating the land use planning and zoning's control. to ensure that an area is in line with the population density and residential buildings. All these is done through comprehensive planning control in the Local Plan (LP) and Special Area Plan (SAP) that are subjected to the legislation in the Town and Country Planning Act, 1976 (Act 172) for states in Peninsular Malaysia, while the Federal Territory of Kuala Lumpur adopts the Federal Territory (Planning) Act, 1982 (Act 267). Furthermore, the requirement and application of density in town planning can also be explored in other by-law documents.

There are various definitions of density discovered by past researchers. According to the Federal Territory (Planning) Act 1982, under Section 2 (1) and the Town and Country Planning Act, 1995 Act 172, the definition of 'density' means the intensity of land use calculated according to the number of people, residential units, or rooms (current practice in density measurement is not according to the number of rooms) or any combination of those factors for one unit of land area. The important aspects of density for sustainability remain the

question of what figures or values are appropriate, and on this matter, theorists and scholars are rarely specific and often have different views (Burton, 2002). Figure 1 shows Alexander (1993) illustrate that density measures are part of the design professional's 'kit of tools'. They include density indexes, such as the number of people per hectare and the number of dwelling units per acre, and related measures of land use intensity, e.g., coverage and floor area ratios. As part of the conceptual vocabulary of architects, municipal engineers, land use planners, and urban designers, they affect applications ranging from the design of housing clusters to the zoning standards for entire cities.

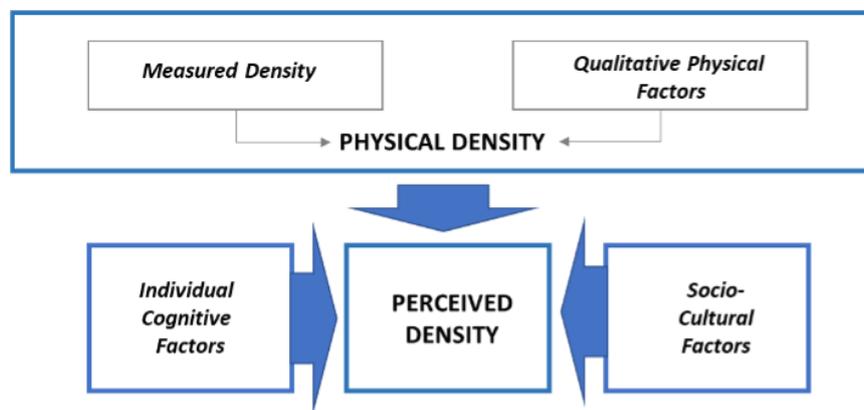


Figure 1: Perceived, Physical and Measured Density Concept
 Source: R. Alexander (1993)

In fact, several authors have discussed different types of density and the probable correlations between quantitative indicators and their morphological and qualitative implications, and there is no agreement on what the optimal residential density is. It is well accepted that certain urban and residential living situations are linked to density (Vicuna, 2012). However, density may be described in a variety of ways; simply expressed, density is the number of 'things' per unit of geographical area. Density is a broad notion that encompasses more than people and residences. Density is often defined in terms of population per square mile (km), but such a crude measure makes it difficult to understand the relationship between density and city life (Udell et al., 2014). Density even sounds like a bad word, to be said with distaste, like 'pollution', or 'congestion'. A common line among planners is: if there is one thing people hate more than sprawl, it is density and there are a lot of misunderstandings regarding what dense development is (Ibrahim Dincer, Marc A. Rosen, 2005).

We must consider the density of jobs, schools, and services such as retail, transit, and recreational facilities when considering density (Campoli, 2012). Many diverse methods for collecting, analysing, presenting (Churchman,

1999), defining, and calculating what appear to be comparable types of densities (e.g., housing density, habitable rooms per hectare, and site density) can lead to ambiguity and misinterpretation (Meta Berghauser Pont et al., 2014). However, the concept of spatial density remains hazy and difficult to grasp. There is a scarcity of knowledge about how decision makers think about density, including the many types of density and the larger political and economic framework in which decisions are made: who makes density decisions, when they make them, and what they use to make those judgments (Boyko & Cooper, 2013). The various dimensions of 'density' can be explained in a variety of ways, ranging from simple numerical measures to the complicated concept of human perception. Density encompasses a wide range of definitions in terms of physical measurement; consequently, whenever the phrase is used, an explicit description of the measure must be supplied to avoid undue confusion. When it comes to human perception, it's not so much the physical density as it is the interaction between people and their surroundings. Individual cognitive characteristics and socio-cultural influences, however, play a role in the perception of density (Ng, 2009).

In other aspects of density measurement, most of the scholars and authors above explain about quantitative measures in determining density. According to Figure 2, Boyko & Cooper (2011) explained and deliberated comprehensively in which density is more than a quantitative calculation that exists on its own; it must incorporate both 'hard' (i.e., quantitative) and 'soft' (i.e., qualitative, contextual) factors in order to be regarded an important part of the urban environment. Vicuna (2012) also claimed that density is an objective and quantitative metric, referring to a spatial fact computed from the ratio of people or housing units per square metre. It is a formula for regulating city expansion on the one hand, and an indicator for analysing the urban phenomena on the other. However, one could argue that this is a rather reductionist approach to the issue of density, given that it is a broad and complex concept whose difficulty in measurement has resulted in a variety of definitions of the concept, including gross and net density, residential density and adjusted density, population density, spatial density, edificatory density, and social density, among others.

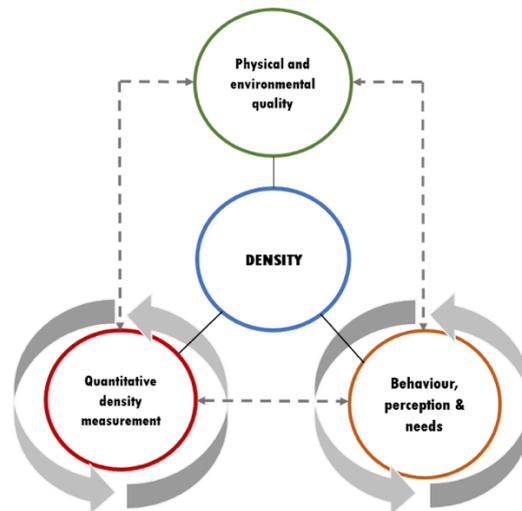


Figure 2: Density Conceptual
Source: Boyko and Cooper (2011)

Beyond these measures, density as a numerical indicator is not a phrase that adequately describes the state of urban life, because our experience of density is not always quantifiable. As a result, a third complication linked with density is its subjective and qualitative condition, which may be explained not only by the intensity of usage and activities, but also by people's relationship with the built environment's spatiality. Indeed, depending on its design elements, the interaction between public and private spaces, and the surface of green areas, among other morphological aspects, a residential complex may be considered as overly packed or not (Vicuna, 2012).

There has been much research and writing about the potential to deliver the same density of buildings in quite different ways. Even measurements like FAR (Floor Area Ratio) and other such formulae are not necessarily useful indicators of success since they only measure size or quantity. The performance of higher density urban forms needs to be measured in a more complex and complete way and qualitative criteria are needed. From the above, only David Sim (2019) came up with nine (9) qualitative criteria in relation to higher density development and to assess quality. The Canadian Urban Institute (2017) also proposed a qualitative measure and analysis in five (5) case studies to encourage users to look beyond buildings and consider the attributes that work with density to create complete communities, with six (6) key drivers of complete communities illustrating walkability, diversity, green and open spaces, amenities, transit, and design. However, both qualitative measures introduced by David Sim (2019) and the Canadian Urban Institute (2017) are not well translated and apply

to formulae or matrix with value to justify and support the measures of density in quantitative.

According to Churchman (1999), population density provides a better indication of the number of individuals who are likely to use the region in issue. The number of dwelling units in each area is determined by residential density. Residential density and population density, on the other hand, are both averages. High planning density and its alleged negative consequences on the quality of life of urban dwellers have been a major source of concern in planning and other related professions.

Furthermore, Sivam et al. (2012) explained that residential density is a frequently used concept often applied in planning practice. The notion of density policy is well understood; however, it is perceived, and by extension applied, differently across the world. In Kuala Lumpur, *Pelan Bandaraya Kuala Lumpur 2020 (PBRKL 2020) - Volume 2 (Development Control) 2018* serves as the main reference in determining the density and it spelt out the residential density allowed based on the following requirements: (i) control and maintain the shape and construction of a site, (ii) maintain and adapt the character of the surrounding area, (iii) control and create an appropriate balance between the residents of an area with the capacity of facilities or existing infrastructure or planned for the area, (iv) control and maintain the level of development security and population in areas with potential risk due to geotechnical conditions, (v) encourage an increase in population to support urban services such as public transport, local trade, and community facilities, and (vi) provide various types of residential buildings to meet the needs of residents and future urban communities.

Regarding residential density definition and measurement, there are three types of high-rise residential buildings in Malaysia, which are flats, apartments, and condominiums. The difference of high-rise residential buildings is based on facilities offered by the management committee. Flats usually have open parking, limited elevators, and security (some of them do not have any security controls, especially in low-cost residential areas). Apartments offer better facilities, such as a recreation area, playground, elevator, and normally they are in gated areas with security control, as compared to flats. Other than that, condominiums are high-cost residences that are completed with modern lifestyle facilities, such as swimming pools, gym, laundromat, elevators, and tight security in a gated area.

METHODOLOGY

In determining the density, the past scholars and researchers only discussed quantitative measurement in their research and some of them did the study on qualitative measurement of density but not taking qualitative criteria as part of the density measurement objectively. The quantitative measurement is no longer a relevant indicator in determining density since development plots of land have

different character and different density to carry them. A systematic literature review method (Figure 3) was applied to this article that includes planning, selection, extraction, execution identifies, selects, and critically appraised research to answer the research question (Okoli, C. & Schabram, K., 2010). Three real cases were identified to address the challenges of density of high-rise residential buildings in Malaysia. These three cases were selected as they were focused on density from a planning perspective in the Federal Territory area. Then, the findings were presented in three parts, which are challenges in pre-development, post-development, and development control.

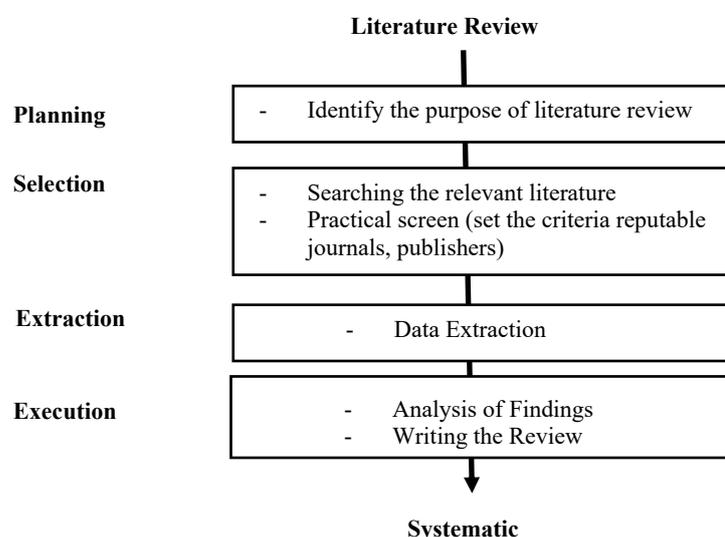


Figure 3: Systematic literature review methodology
Source: Adapted from Okoli, C & Schabram, K (2010)

FINDINGS

The challenges in high-rise planning density can be discussed in three situations, which are pre-development, post-development, and development control as follows.

Challenges in Pre-Development

Pre-development is the determination of residential density at the planning stage before submitting the Planning Permission (PP) or Development Order (DO) to the One Stop Centre (OSC) application in Local Authorities (LA). The determined density will be the basis of planning control and intensity (land use zone, density, plot ratio, and height) based on what has been set in each Local

Plan (LP). This will further be reviewed before PP or DO approval is given by the LA. Two real cases have been selected at this pre-development level.

First, residents in Taman Tiara Titiwangsa who were against a high-density project reported by Free Malaysia Today News (Soo, 2019). The low-density area of Taman Tiara Titiwangsa was formerly known as Kampung Seavoy, a historic community (part of Kampung Air Panas, a Chinese New Village). This plot of land was set aside for high government officials. This tract of land (7.66 acres) was originally designated as a community centre and football field in the 2012 Draft Kuala Lumpur City Plan (DKLCP), but it has since been rezoned to residential-commercial. Previously, the plan was for a 1,500-unit condominium with a population density of up to 800 people per acre. Taman Tiara Titiwangsa was capped at a density of 32 residents per acre and existing roads and infrastructure cannot cater for any more traffic volume as it will lead to congestion. This case found three challenges that are: (i) the requirement of density has been approved by LA putting pressure on residents, (ii) problems arise for the surrounding residents jeopardising their daily life such as traffic congestion and current infrastructure can't cope with the new developments, and (iii) due to the presence of specific persons on the board of trustees of Yayasan Wilayah Persekutuan (YWP), which held the piece of property, there was a blatant conflict of interest on the part of Kuala Lumpur City Hall (DBKL).

The second case was in Taman Rimba Kiara reported in New Straits Times (Salleh, 2021). The upcoming project in the Taman Tun Dr Ismail (TTDI) area shows an increase in population density from 74 people to 979 people per acre of land (0.4 hectares). This density is claimed to be an inappropriate amount as the TTDI area itself faces severe traffic congestion, especially during peak hours. Resident Committee Members (RCMs) are unhesitant to take firm action through law and court if the project continues to be carried out despite strong objections from the locals. Furthermore, the site for the said project has been gazetted as a public open space and house of worship based on the previous Kuala Lumpur Local Plan 2020 Draft (KLLP2020). Previously, on January 27th, the Court of Appeal issued a unanimous judgement declaring the Taman Rimba Kiara project's development order (DO) null and unlawful. This judgement is a big success for the community and neighbouring communities, who have fought and committed to preserve Taman Awam Bukit Kiara, formerly known as Taman Rimba Kiara, with tenacity and determination. Thus, the challenges can be described as: (i) the proposed high-rise residential project will cause the surrounding area to be filled with development with the increase in the number of vehicles to their area during peak hours, (ii) KLLP2020 has gazetted the proposed site as a public open space and house of worship and obviously conflict with the development's proposal, and (iii) residents are upset because there is a conflict of land use zone in KLLP 2020 and the decision which approved the project.

Based on these two real cases, it can be concluded that the challenges raised in the media related to residential density become a serious concern for the public (positive or negative). However, the majority of the challenges are related to the dissatisfaction with the increasing numbers of high-rise residences due to the increase in population and residential density. These findings can therefore help to prove that density is certainly an intricate challenge, just like Vicuna (2012) stated in her study that density is a complex issue. Her research provides an anecdote about patterns and determination of urban life forms that are often used in the wrong way. Although residential density is not directly related to the types of buildings, it does articulate the density of the area, the total population in an area that can create interactions, appropriate activities, and urban functionality. However, if the density determination is wrong, the city will be inefficient, as a neighbourhood will also be a dead zone and valuable resources are used to solve problems (Boyko, 2014).

Challenges in Post-Development

At this stage, the focus will be on the impact of the density which has been approved by the LA through the One Stop Centre Committee (OSC) based on the scenario that the density defined in the LP and the construction was completed. The previous section tells the underlying issues based on two case studies whether there was compliance according to the requirements of LP guidelines and plans with the density set in the LP or has received approval for the original density in LP. However, the impact of density gazetted in LP occurred after the development of high-rise residential buildings was completed.

A case study was selected to discover the challenges of high-rise planning density at the post-development stage. It was reported at EdgeProp.my by Tan Ai Leng (2018) about residents in Desa Putra Condominium expressing their concerns about They are concerned about the high-density development surrounding their homes, which they believe would degrade their living environment. The complex, which included 436 flats in three 18- and 19-story towers, was completed in 2006. The property is located in Wangsa Maju, on Jalan Wangsa Perdana 3, directly across from the Sri Rampai LRT station. Desa Putra Condominium is flanked by several high-density developments, including the 42-story The Hamilton Wangsa Maju building (435 apartments), which is only 300 metres away, and the Wangsa 9 Residency, which is 700 metres distant and consists of 565 units contained in three 48-story blocks.

However, the occupants were swayed by the announcement of a new commercial development that includes 382 serviced apartments in a 46-story building, which is located next to their apartment and within 100 metres of their home. According to the Dewan Bandaraya Kuala Lumpur (DBKL) project development notice board, the future construction would consist of 382 serviced apartments in a 46-story building with an 8-story parking garage. The proposal

must not be permitted if it contradicts the Draft KL City Plan 2020. If this is to be challenged, residents must be given the opportunity to adequately object. Thus, it can be highlighted that: (i) the failure of LA to involve the public or the community to obtain project-related views, and (ii) the proposed projects were contrary to the Draft KL City Plan 2020 (Local Plan). New development of high-rise residential density will jeopardise the current traffic flow, and the residents are worried about their future living environment as the green lung area nearby has shrunk at a fast pace in recent years and some mudslides have occurred during the construction of the new projects nearby.

As Evenson and Cancelli (2013) explained, more people and traffic will dominate local services and infrastructure, and transit will be worsened. All these show a great degree of justifying how density could give chain effects from one issue to another. People are worried and afraid of increasing density in their communities. Some of them do not want change and even those who believe that high residential density will have an impact on lifestyle and increased property values. Meanwhile, some believe local services and infrastructure will be dominated by more people, and traffic and transit will worsen (Evenson & Cancelli, 2013).

Challenges in Development Control

The land-use planning system's cutting edge is development control. It is the method by which most people are affected by planning, and it may be said to have the most direct consequences. The essence of development control is that most types of growth require prior approval. Building control deals with the development of individual buildings in greater detail, whereas land-use control deals with broader areas. Building byelaws must clearly be framed by local government institutions in order to limit development, and these laws must be enforced with the support of a team of experienced planners (Ahmad & Bajwa, 2005). Susanti et al. (2016) listed those major components in shaping a high-density housing metropolitan region. The highly market-driven land price efficiently enforces dwelling land use. The housing function was pushed to construct the most densely populated area as a result of this condition. The density housing ratio tracks the increase in the number of dwellings per square kilometre. The density of these housing structures must be kept under control.

As discussed in the previous section of this paper, density or residential density is very much related to land use and population. Whilst the population in urban areas are reportedly increasing, nevertheless, land use is the critical and complex component because it involves many parties with different interests or agendas. Due to its complexity, land use activities are managed by development control to avoid manipulation and other issues. This planning-led system forms as a tool to regulate land use and new buildings. In a planning permission (PP) system, density is often determined at the initial stage of development. Density is

also stated in policies in local plans, but each development is viewed separately, and it is a decision made by the individual. This leads to the issue of how to get a more practical approach, but if continued, uncertainty will affect the value of real estate. There is an issue raised: how to ensure the density level of a neighbourhood is appropriate? (Gordon et al., 2016).

There must be uniformity in the act or law to control the development of this high-rise residential. The existing acts or laws seem to manipulate more towards profit than well-being for the people. Proper control of high-rise residential development involves those responsible for determining the direction of development not only looking at the current situation but also the future in providing good quality development in urban areas. Cooperation between the parties involved, such as local authorities, professionals (planners, architects, and others) and developers is significant in implementing more conducive, sustainable, and residential area design and building design control, without neglecting the viability of the project and efficient profits, as well as the need for infrastructure facilities. This indirectly allows residents and the local community to enjoy a good quality of life in a sustainable urban environment. The writers and publications surveyed for this subject have backgrounds in planning, urban design, architecture, environment behaviour studies, transportation, economics, sociology, psychology, anthropology, and ecology, indicating that density is a multidisciplinary topic (Churchman 1999).

CONCLUSION

In summary, density is not a simple word and action to be taken in urban planning and residential development. At the most fundamental level, density measures must be clearly and plainly specified for us to communicate and learn from one another's experiences. This paper has demonstrated its knowledge, practice, and opened the way to more valid investigations, continued research and further studies in a field where qualitative measures or criteria of residential density are severely lacking. A final lesson is that much more research is needed on the numerous elements and repercussions of various types of qualitative density measurements, as there are many methods and measures of quantitative densities in use today all over the world. This is particularly true for the relationship between pre-development and post-development stages being so much related to density's impact, and the hope is that a greater knowledge of density would lead to more efficient density-related high-rise residential development planning and development in Malaysia.

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