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DETERMINATION OF SPECIAL PERMIT RATE FOR LARGE-SCALE SOLAR DEVELOPMENT IN JOHOR BASED ON PLANNER PERSPECTIVE

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Abstract

Over the past decade, the Malaysian government has put its effort into various programmes to promote solar energy in the country. As for now, Large Scale Solar (LSS) is the biggest programme conducted by Sustainable Energy Development Authority (SEDA) and permitted by Energy Commission (EC). As the large-scale solar does not have any proper guideline, especially in development approval consideration, Johor land administrators have put telecommunication tower development as a benchmark in approving large-scale solar developments that use the Special Permit method. However, the Special Permit fee appears unfitting for the development. Thus, this paper aims to determine the Special Permit rate for large-scale solar development which are profitable to the stakeholders. Its drawback is particularly related to solar radiance, which is the key criterion of site selection to develop the most profitable site. Selected respondents have been interviewed and the findings have led to a direction to standardise a legal framework for large-scale solar, especially in Johor.

Keywords: solar development, planning, profitable, large scale solar

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INTRODUCTION

The Malaysian government aspires to increase its contribution of 20 percent of renewable energy production by 2025, aligned with the Climate Change Convention and Paris Agreement agreed by the United Nations (UN) on the Sustainable Development Goals (SDGs) agenda. Thus, the government has endorsed a Renewable Energy Policy and a Renewable Energy Action Plan in April 2010 as a measure to strengthen the development of alternative energy, especially in the photovoltaic industry. Recognising the potential of solar energy generation in the country that can support the extinction of natural resources and profitable investment, the government has established Sustainable Energy Development Authority (SEDA) in 2010 with various program initiatives such as Feed in Tariff (FiT), Net Energy Metering (NEM), and Large Scale Solar (LSS).

The LSS program has been established in the 11th Malaysia Plan (2016-2020) that aims to accelerate the increase of renewable energy production in the country. However, it has expanded to the next phase which involves new LSS capacity planned for 2020 to 2025. This program started operations in 2017, and now has increased to 21 LSS in the country (Energy Commission, 2019). Moreover, the implementation of this program is subject to the bidding process through tenders conducted by the EC and there is no specific quota allocation by the state. So far, SEDA and EC has awarded around 1634.21 Megawatt of solar energy through the LSS program, their sprinkles are divided as shown in Figure 1.

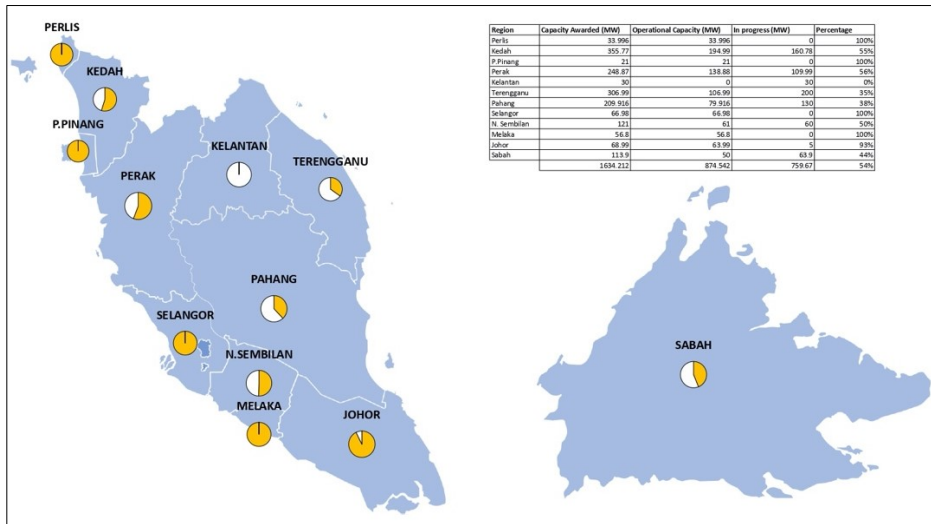


Figure 1: LSS Progress by Region Q1 2021

Sources: Energy Commission, 2021

Taking into the current scenario of large-scale solar development in Johor, most of the developers that have been awarded with as much 68.99 Megawatt are not landowners. Typically, they will lease the potential farmland through an agreement with the landowner for a long time (Johor Land and Minerals Office, 2020). Besides that, some of the landowners and developers are partners through a cooperation agreement to use the land for large-scale solar development. In addition, the landowner can make additional profit by leasing their land to a developer (T. Grout and J. Ifft, 2018). A research in the United States found that landowners typically get around 250 to 2,000 per acre, per year for leasing their land for large-scale solar development (Solar Land Lease, 2020). In Johor, the implementation of a Special Permit to use agricultural land for non-agricultural purposes is stated in Rule 38D of the Johor Land Rules, read together with the circular of the Director of Lands and Minerals of Johor No 1/2006. This circular describes the application method, jurisdiction to approve Special Permits as well as the application fee and permit approval fee. However, the circular only details the implementation of Special Permits for the purpose of construction of telecommunication towers and the fee seems unsuitable for large-scale solar development. This is because large-scale solar needs larger land acres, needing approximately 2.5 acres per Megawatt (MW) energy produced, compared to a telecommunication tower that only uses a 20-metre square of land for each development (PLANMalaysia, 2019; Solarvest, 2018). This leads to land administrators to revise and set up a new Special Permit fee especially for large-scale solar development. Thus, N.A. Naamandadin et al. (2018) addressed the relationship between solar radiance and the power generated, and it would be the most important variable or criterion to set the new Special Permit fee especially for large-scale solar development.

RESEARCH BACKGROUND: SITE SELECTION CRITERIA FOR LARGE-SCALE SOLAR DEVELOPMENT

Recently, interest in sustainable energy supply has increased exponentially as there will be an increase in world energy in the next few decades (Edenhofer et al., 2014). Furthermore, energy is a key element of sustainable development, economic growth, and well-being. Recognising the global energy resource crisis, solar energy is one of the cleanest energy alternatives, providing minimal environmental impact with cheaper costs and unlimited supply (Urmee et al., 2009). According to the great potential of this energy, it would be a good motivation to developers to invest in large-scale solar development and the most profitable site would be selected.

Issues arise as large-scale development is still new in the country and land administrators do not have any proper guidance in approving the application. Based on current practices in other states, there are several methods of approval

by the state authority due to large-scale solar development, and this will be affecting the fee of the development indirectly. For example, from the land administration's perspective, some of the states use Special Permit and some of them need land conversion. This is because of the large-scale solar development that usually uses farmland, and it is contradicted with the express condition of the land as mentioned by Tenaga Nasional Berhad (2019) that solar energy generation is categorised as industrial development. Basically, Special Permit is a method for approving and allowing non-agricultural development activities carried out on agricultural land (INSTUN, 2015).

So, as to set up a new Special Permit fee especially for large-scale solar developments, the most important criterion is solar radiation as it was stressed in previous studies. This Special Permit fee should be set so that it can be used as a reference for investors and developers as it will give financial implications, including development profit and feasibility of the project (Johor Land and Minerals Office, 2020).

In order to develop large-scale solar, many elements and criteria need to be considered, where most of them come from the planner's perspective, especially in site selection. Moreover, according to Yang et al. (2017), the potential of the solar energy depends on the site or location to install the Photovoltaic (PV) instruments and it is highly related to energy that can be produced. Thus, the site selection criterion would be a crucial component that includes maximising energy production, proximity to electrical infrastructure, ecological impacts, and permitting issues (Daria & Igor, 2017). Solar energy can be produced by absorbing sun radiation through PV solar panels to generate electricity. Hence, solar power generated is highly dependent on solar irradiance in the site (N.A. Naamandadin et al., 2018). However, the location with the best source of solar radiance is not always the best choice because there are other criteria that should be considered by planners and developers such as the economic, social, and environmental factors (Van Harren et al., 2011). The site selection criteria by previous research can be concluded as shown in Table 1.

Table 1: Site Selection Criteria by Previous Research

Criteria/ Elements/ Variable	EPA (2015) United States	Sabo et al (2016) Malaysia	Carrión et al. (2008) Spain	Charabi and Gastli (2011) Oman	Uyan (2013) Turkey	Sánchez- Lozano et al. (2013) Spain	Watson and Hudson (2015) United Kingdom	Daria and Igor (2017) Ukraine	Razali and Zulkiflee (2012) Malaysia
Solar Radiation	/	/	/	/	-	/	/	/	-
Diffuse Irradiation	-	-	/	-	-	-	-	-	-
Equivalent Sun Hours	-	-	/	-	-	-	-	-	-
Average Temperature	-	-	/	-	-	/	-	/	-
Road Access	/	/	/	/	/	/	/	-	-
Grid Connection	/	/	/	-	/	/	/	/	/
Slope	/	/	/	/	/	/	/	/	/
Aspect (Orientation)	-	-	/	-	-	/	/	/	-
Minimum Suitable Areas	/	-	-	-	-	/	-	-	-
Agrological Capacity	-	-	-	-	-	/	-	-	-
Urban Areas	/	-	/	/	/	/	/	-	-
Residential Areas	-	-	/	/	/	/	/	/	/
Wildlife Designations	/	-	/	-	/	/	/	-	-
Hydrographic Areas	/	/	/	/	/	/	-	-	/
Touristic Sites	-	-	-	/	/	/	/	-	-
Landscapes Designations	/	-	/	-	-	/	/	/	-
Traffic Areas	-	-	/	/	/	-	-	-	-
Sand/ Dusk Risk	-	-	-	/	-	-	-	-	-
Land Subsidence	/	/	-	-	-	-	-	/	-
Soil Erosion	/	-	-	-	-	-	-	-	-
Land Ownership	-	-	-	-	-	-	-	-	/
Land Use	-	/	-	-	-	-	-	-	/
Population Density	-	-	-	-	-	-	-	-	/

Basically, solar radiation can be defined as electromagnetic radiation emitted by the sun and it can be turned into solar energy using a variety of technologies (Department of Energy United States, 2020). Furthermore, the electromagnetic radiation emitted by the sun covers a very large range of wavelength from radio waves through infrared, visible, and ultraviolet to x-rays and gamma rays. Nevertheless, the amount of solar radiation absorbed by any surface depends on how much the energy is incident on that surface including their fraction. Usually, only 40 percent of solar radiation is received by the earth's surface on clear days, and the flux of solar radiation is influenced by the angle between the direction of the sun and photovoltaic panel surface (S.C. Bhatia, 2014; R.E. Dickinson, 2003). Theoretically, the solar radiation is influenced by other suitability of site selection criteria (refer to Table 1).

Sabo et al. (2016) have analysed solar radiation which can be observed by solar panels at power selected power stations per hour and per square metre among states in Peninsular Malaysia. Based on that study, solar radiation rate is higher, that is almost or more than 5kWh, in the northern part of Malaysia, especially in Kedah, Perlis, Penang, Perak, and Selangor (refer to Figure 2). Based on Figure 2, Johor has the lowest average SR rate of 4.1 to 4.2kWh compared to Kedah's 5.2kWh. This means faster returns on investment are obtained in the northern states due to higher volume of energy sales to the National Grid.

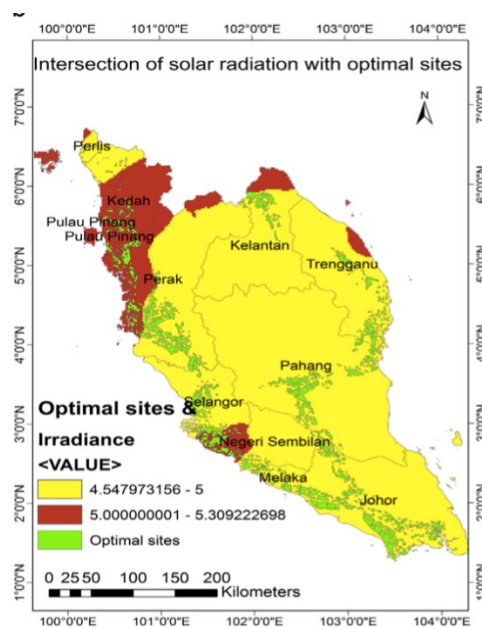


Figure 2: Intersection of Solar Radiation Value in Peninsular Malaysia.
 Source: Sabo et al., 2016

METHODOLOGY

This study was conducted using open interviews with selected respondents, and they were selected using purposive sampling according to the research needs and purposes. In addition, the respondents were selected due to the fact that they were directly involved in the approval of solar farms and telecommunication tower developments. Then, the data were analysed using content analysis.

Table 2: List of Respondents in the study.

Respondent	Job Position	Agency
R1	Deputy Director (Development & Management)	Johor Land and Mines Office

R2	Chief Assistant Director, Development Division	Johor Land and Mines Office
R3	Land Administrator	Johor Bahru Land and District Office
R4	Land Administrator	Kota Tinggi Land and District Office

RESEARCH FINDING AND DISCUSSION

Based on data in the literature above, this study has put the states of Kedah and Perak as benchmarks because they use Special Permit and have its fee especially for large-scale solar development. In 2017, Kedah was the first state to offer Special Permit method for agricultural land for the purpose of large-scale solar development without changing land conditions to the industry. Furthermore, these two states have been given the highest total energy bid approval compared to the other states by the Energy Commission, which are 355.57MW in Kedah and 248.87MW in Perak. So far, the total capacity of large-scale solar in these two states is the highest and it indicates that the setup of Special Permit fee in the states is accepted by the developers.

Although solar radiation in Johor is low and does not reach 5kWh, it still has a larger potential area that can be exploited for large-scale solar development in the state. The total potential area for this development among the states of Johor, Kedah, and Perak are as shown in Table 3. Hence, the Special Permit rate can be set up based on the potential area and solar radiation value.

Table 3: Total Potential Areas, Solar Radiance Value, and Special Permit Rate

States	Land Area (Acre)		Potential Area (Acre)	Solar Radiance Value (kWh)	Special Permit Rate (RM)/ m ²
	SR >5	SR <5			
Kedah	140,816.5	0	140,816.5	5.2	0.45
Perak	256,764.9	296,466.2	553,231.1	4.8	0.40
Johor	0	601,201.6	601,201.6	4.1	X

Therefore, the Special Permit rate in Johor can be set up by making a comparison of average value of X/SR in Kedah and Perak. Thus, the ratio of the value X/SR among these three states can be concluded as:

The value X/SR compared to Kedah	RM0.32/m ²
The value X/SR compared to Perak	RM0.38/m ²
The value of X/SR Johor (compared to the average value of Kedah and Perak)	RM0.35/m ²

Thus, based on the interviews that have been held, all respondents have responded on their respective scopes. As mentioned before, this study is to determine the Special Permit rate for large-scale solar development in Johor based on solar radiance. R3 agreed on the ratio value as he said:

R3: "As we (Johor land administrators) do not have any Special Permit rate especially for large-scale solar, the ratio value of RM0.35/m² is the best rate to be used as the basis of the imposition fees by making the average value of Perak and Kedah as a comparative value..."

However, R1 responded that state land administrators (Johor Land and Mines Office) have given additional discounts as solar radiance value of Johor and Kedah is much different, which is 1.1kWh.

R1: "... additional discount of RM0.05 per square metre has been recommended by state land administrators because we are concerned that the solar radiance values between Johor and Kedah are much different. Hence, it would help the developers or landowners to get a higher profit margin through the development compared to the old rate..."

Thus, there is great potential of large-scale solar in Johor as it has a larger area compared to other states, and land administrators have also introduced some incentives as an effort to promote alternative energy in the state.

R2: "... state land administrators are committed to promoting solar energy in the state. Hence, we also gave an additional discount of RM0.05 per square metre especially for companies owned by the Johor State Government to develop large-scale solar which are implemented individually or by partnership. Furthermore, the additional discount also includes Higher Education Institutions and their subsidiaries to encourage their institution's space as a new source of income. These efforts can directly support the development of green technology in the production of clean and renewable energy in the state and nationwide."

Based on the above analysis and description, the Special Permit rate for the large-scale solar development on agricultural land can be concluded as depicted in Table 4.

Table 4: Special Permit Rate Based on Applicant

Applicant	Annual Special Permit Rate
Companies and landowners	RM0.30/m ²
Company owned by the Johor State Government and subsidiaries	RM0.25/m ²
Higher educational institutions/state and federal government institutions	RM0.25/m ²

R4: “... the introduction and implementation of this new Special Permit fee rate is more reasonable, taking into account the appeal that was proposed by the developer in the application for the first solar farm in the state of Johor a few years ago. Thus, it will directly attract developers to develop solar farms as it is very profitable, while promoting this alternative energy.”

Therefore, Table 5 shows the comparison of annual Special Permit rate among the states of Johor, Kedah, and Perak. Although the permit fee rate is lower compared to the other two states, it is an incentive to attract large-scale solar investment in Johor. This is because the rate of solar radiance in Johor is lower compared to these two states. In addition, Johor Land and Mines Office also recommends that only effective development areas with supporting buildings are calculated for the purpose of imposing special permits while the remaining unused areas remain as land for the use of the original purpose as stated in the title.

Table 5: Comparison of Annual Special Permit Rate Among States

State	Kedah	Perak	Johor
Annual Special Permit Rate	RM 0.40/m ²	RM 0.45/m ²	RM 0.25 – RM 0.30/m ²

CONCLUSION

In a nutshell, there are many elements and criteria for large-scale solar development approval consideration, but most of them are from the planner’s perspective such as site selection. It is because site selection is the most critical part as it needs to consider many criteria. Thus, in order to set up Special Permit rates especially for large-scale solar, its drawback is analysed based on solar radiance in the state; the higher the solar radiance, the higher the solar energy and profit that can be produced. Thus, the permit fee depends on the production of solar energy as land administrators or the state government put their effort into promoting this alternative energy in the state.

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THE CONSIDERATION OF ZONING COMPLIANCE ON THE IMPLEMENTATION OF THE FASTRACK NIL IN JOHOR

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Abstract

Under Section 53 of National Land Code 1965, there were lands alienated before the commencement of NLC whereby the titles do not indicate any particular category of land use and express conditions, but instead are stated as ‘Nil’. Therefore, this paper aims to describe the procedure of Fastrack NIL implementation in Johor and its consideration of zoning compliance upon the imposition of land categories and express conditions for land stated as ‘Nil’. Using content analysis and interview with selected respondent using purposive sampling, it is confirmed that the imposition of conditions or land conversion does not need to be in accordance with the zoning compliance. However, this practice is becoming a norm due to the equitable interests held by landowners and taking into account the interest of the state government, thus zoning must be considered in the Fastrack NIL application.

Keywords: Zoning, land category, express condition, quit rent

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INTRODUCTION

The economic value or potentiality of a land depends on the land use properties (Burton *et al.*, 2004). According to the main legislation that governs land throughout the states in Peninsular Malaysia, National Land Code 1965 (NLC), the land use property laid under Section 52 and Section 120. Pursuant to Section 52, the code prescribed that the land use category can be classified into three categories namely agriculture, building and industrial. While Section 120 of the code prescribes the imposition of express conditions and restrictions in interests determined by the State Authority at the time when the land is approved for alienation. The determination of land categories and express conditions is significant to control land use so that it is aligned with the planning aspect of the local development plan and taking into account the interest of the State Authority.

Additionally, land use property is also stated under the Town and Country Planning Act 1976 (Act 172). According to Section 12, land use property referred to as zoning is used to divide land under the statutory area of local authority into sections, permitting particular land uses on specific sites to shape the layout of towns and cities, thus enabling various developments to take place (The World Bank, 2015). Similarly, zoning works as a planning tool to regulate the built environment and create functional real estate markets, it also ensures complementary uses as well as stimulate development in specific areas (McDonald, 1997; Bogart, 1998).

RESEARCH BACKGROUND

Under Section 53 of NLC, there were lands alienated before the commencement of NLC whereby the titles do not indicate any particular category of land use and express conditions, but instead are stated as 'Nil'. These were the lands which had been alienated before the commencement of the NLC. According to the Jabatan Ketua Pengarah Tanah dan Galian Persekutuan (2002), during that time there was no specific provision under the previous land law that allows the imposition of land use categories as currently available, namely agriculture, building and industry. Besides, the town or village zoning plan remains unclear (Lee, 2020). The alienation of these lands under the land law before the enactment of NLC only classified these lands into two (2) types, namely Town Land or Village Land; and Country Land. The State Authority at that time had the liberty to impose any express conditions in land use as they think fit (Awang, 1997).

Although this type of land is valuable since the owner can use it for any purpose or a combination of purposes, the quit rent amount charged on these lands may be even higher than the market value. In Pahang, Pahang Land (Amendment) (No. 4) Rules 2019 stated that lands with no category and specific conditions shall be charged two times, the highest rate of rent payable in the state (Lee, 2020). Similarly, this type of land has also experienced a spike in quit rent in Johor ever since the JPU 49 was gazetted and a new rate of quit rent was enforced on 1st

January 2020. As illustrated in Table 1 below, the new quit rent under JPU 49 is charged according to the land use condition for ‘A Class Urban Land’ plus 40% additional rate charged according to the land use category, i.e., agriculture, building, or industry. Consequently, Pavither (2020) highlighted that the quit rent is found to have increased significantly, for instance, in Kluang (from RM90 to RM750), Tangkak (from RM7 to RM150), Johor Bahru (from RM100 to RM1,000), and Tebrau (RM5,275 to RM21,000).

Table 1: The difference of quit rent rate between JPU 95 and JPU 49 for the land under Section 53 of NLC

Types	JPU 95		JPU 49	
	Rate (RM)	Calculation	Rate (RM)	Calculation
Category: Agriculture				
Conditions NIL	No stipulation under JPU 95 Revision from Johor Land and Mine: <ul style="list-style-type: none"> • Vacant land - RM150/hectare • Developed land – rate based on land use condition / building on land (according to the Site Officer report) 	Vacant land Sample area: 0.14540 hectare 0.1454 hectare < 1 hectare = RM150.00	RM250/hectare or part of it	Vacant land Sample area: 0.14540 hectare 0.14540 hectare < 1 hectare = RM250.00
Category: Building				
Conditions NIL	No stipulation under JPU 95 Revision from Johor Land and Mine: <ul style="list-style-type: none"> • Developed land – rate based on land use condition / building on land (according to the Site Officer report) 	Residential: A Land Category Sample area: 1570.34 square meters = 16 (rounded) x RM21 = RM336.00	The rate of quit rent is according to the land use category for ‘A Class Urban Land’ plus 40% additional rate charged according to the land category	Residential: A Land Category Sample area: 1570.34 square meters = 16 (rounded) x RM30 x 40% = 16 x RM42.00 = RM672.00
Category: Industry				
Conditions NIL	No stipulation under JPU 95	Heavy Industry: A Land Category Sample area: 0.3242 hectare	*RM3,000.00 for area less than 5,000 square meters	Sample area: 3,242 square meters 3,242 m ² < 5,000 m ²

Revision from Johor Land and Mine: • Developed land - rate based on land use condition whether heavy, medium or light industry (according to the Site Officer report)	0.3242 hectare < ½ hectare = <u>RM2,300.00</u> (minimum) ** RM2,900.00 / > ½ hectare Medium Industry: A Land Category Sample area: 0.3242 hectare 0.3242 hectare < ½ hectare = <u>RM1,900.00</u> (minimum) ** RM2,400.00 / > ½ hectare Light Industry: A Land Category Sample area: 0.3242 hectare 0.3242 hectare < ½ hectare = <u>RM1,400.00</u> (minimum) ** RM1,800.00 / > ½ hectare	*RM5,000.00 for area more than 5,000 square meters but less than 10,000 square meters *RM50.00 for each square meter for area more than 10,000 square meters or part of it	= <u>RM3,000.00</u> Sample area: 9,635 square meters 5,000 m ² > 9,635 < 10,000 m ² = <u>RM5,000.00</u> Sample area: 23,342 square meters 23,342 square meters > 10,000 m ² = 234 (rounded) x RM50 = <u>RM11,700.00</u>
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Category: No land use and express conditions

No land use and express conditions	No stipulation under JPU 95 Revision from Johor Land and Mine: • Developed land – rate based on land use condition / building on land (according to the Site Officer report)	Rate is based on the calculation above according to the related land use category	The rate of quit rent is according to the land use category for 'A Class Urban Land' plus 40% additional rate charged according to the land category	Agriculture: Use for orchard Sample area 2.72 hectare 2.72 hectare < 4 hectare =3.0 (rounded) x RM42.00 = <u>RM126.00</u> Building: Residential: A Land Category Sample area: 1570.34 m ² = 16 (rounded) x RM30 x 40% = 16 x RM42.00 = <u>RM672.00</u> Industry: A Land Category Sample area: 23,342 m ² 23,342 m ² > 10,000 m ²
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= 234 (rounded) x
RM49
= **RM11,466.00**

To rectify the situation, Johor Land Administration initiated Fastrack NIL campaign to address the issue. The initiative aimed to encourage landowners to apply for the imposition of land categories and express conditions to align the actual and ongoing development on the land or development as gazetted in local plan. This initiative will assist to parallel the amount of quit rent imposed on the land to the current market value. However, conflict of zoning may arise if the landowner decides to apply through Fastrack NIL. Therefore, this paper aims to describe the procedure of Fastrack NIL implementation in Johor and its consideration of zoning compliance upon the imposition of land categories and express conditions for such land.

THE IMPOSITION OF LAND USE CATEGORIES AND CONDITIONS FOR THE LAND UNDER SECTION 53 OF NATIONAL LAND CODE 1965

Before or after the commencement of NLC, land alienated by the State Authority must be categorised under one of the three categories whether agricultural land, building land or industrial land. Before NLC was enacted on 1st January 1966, there was no specific provision under the previous land law that recognised the imposition of land use categories as the one currently available under Section 52 of the code (Awang, 1997; Jabatan Ketua Pengarah Tanah dan Galian Persekutuan, 2002). Besides, the town or village zoning plan during that time remains unclear (Lee, 2020). As mentioned by Awang (1997), the land use category before the commencement of NLC is restricted to the type of use such as ‘padi’, ‘dusun’, ‘jetty’, ‘factory’, or NIL. The alienation of these lands under the land law before the enactment of NLC only classified these lands into two (2) types, namely (i) Town Land or Village Land; and (ii) Country Land. The State Authority at that time had the liberty to impose any express conditions in land use as they think fit (Jabatan Ketua Pengarah Tanah dan Galian Persekutuan, 2002).

However, when NLC came into force in 1966, Section 53 was automatically imposed on all country, town, and village lands held under the Land Office Title, subjected to implied conditions for agricultural purposes only. While Section 53(3) provides that any country and town land registered under Registry Title with a category neither being agriculture nor industrial are subjected to the use for the purpose of building only. Nevertheless, this provision does not prevent the landowner to utilise his land for the purpose of agriculture, building, or industry which had long been operating legally prior to the enactment of NLC.

According to Awang (1997), the category imposed on a piece of land does not come with guidelines to tell the landowner on how to utilise the land legally. Thus, this shortcoming of Section 52 must be complemented with imposition of conditions as a mechanism to guide landowners. Awang (1997) further explained that the endorsement of express conditions as well as the automatic application of implied condition as stated under Section 115 (for agricultural land), Section 116 (for building land) and Section 117 (for industrial land) will then guide the owner. For instance, his agricultural land can only be cultivated for the purpose of growing a specific crop for e.g., oil palm, pineapple, cocoa, or etc. Therefore, express conditions and categories of land exist to complement and strengthen each other.

However, the interests for every land under the demarcated administrative boundary held by the State Authority are broad. Thus, restrictions in interest give more room to the State Authority to exercise its power within the range of its discretionary limits. Restriction in interest will allow the State Authority to endorse specific terms on the land to meet the special needs or interests of the state (Awang, 1997). In Johor, the restriction of interests can be found in the statement such as ‘the land could not be transferred to non-bumi unless approved by the State Authority’.

The power to impose express conditions and restriction in interest by the State Authority is held under Section 120 of NLC. Both terms ‘condition’ and ‘restrictions in interest’ that usually appear together in the NLC bear different meanings and thus hold different legal implications. According to Section 5 of NLC, ‘restriction in interests’ is defined as any limitation imposed by the State Authority on any of the powers conferred on a proprietor by Part IX, or on any of his powers of dealing under Division IV, and any like limitation imposed under any previous land law. While ‘condition’ is referred to as anything that does not include any restriction in interests (Section 5) or any express or implied condition in any agreement in which the State Authority is not a party (Section 103).

From the definition, both terms can be distinguished clearly whereby restriction in interests is referred to as any limitation imposed by the State Authority on the power of the registered land proprietor on his land to subdivide, partition, or amalgamate as well as the limitation on his power to deal with it by way of transfer or the creation of a lease, charge, easement, tenancy, statutory lien. While condition is more related to the manner to which the land is to be utilised by the landowner. For example, the State Authority may impose express conditions on agricultural land requiring the cultivation of specific crops. These conditions and restriction in interests are imposed by the State Authority at the time when the land is approved for alienation and must be endorsed on or referred to in the document of title.

The discretion of the State Authority to impose express condition and restriction in interests in respect of alienated land is not controlled in regard to

initial alienation. The imposition is only driven by political or socio-economic considerations. As provided under Section 120(1), the State Authority may alienate land under this Act subject to such express conditions and restrictions in interests conformable to law as it may think fit.

However, the imposition must be conformable to any written law in force. Thus, whenever the State Authority acts in accordance with its discretion to impose conditions or restriction in interests on the land as described under Section 53, does the imposition of land categories and express conditions for the land require zoning consideration? Since Section 120 of the NLC recognise the power of the State Authority to impose land use categories and conditions, among others to control land use and coordinated it with the planning aspect without disregarding the interests of the state government, does it require State Authority to comply with the planning term under the provisions of Town and Country Planning Act (Act 172)? These questions are somehow responded to by the provision as laid under Section 108 of the NLC provides that ‘conditions attached to the land title shall prevail over planning restrictions. This question is further analysed and detailed in the subsequent section.

METHODOLOGY

To address the key objective, this study employed a qualitative research method. Data primer consists of a series of in-depth interviews that were conducted with Johor Land Administration Officer to study the process of the imposition of land use categories and conditions for the land in question under Section 53 through the Fastrack NIL campaign. Using purposive sampling, four respondents from the Johor Bahru Land Office (PTJB) and Office of the Director of Land and Mines Johor (PTG Johor) were selected. These officers have direct involvement with this campaign from the proposal stage until its approval by the Majlis Mesyuarat Kerajaan Johor on 11 September 2019, as well as its implementation. Besides, years of service is one of the eligibility indicators of the respondents to be part of this research. The list of the selected respondents is briefly shown in Table 1 below.

Table 1: List of respondents involved in this study

	Job Position of the Respondent	Experience	Code
PTG Johor	1. Deputy Director 1	20 years	R1
	2. Chief Assistant Director (Development)	15 years	R2
PTDJB	1. District Land Administrator	16 years	R3
	2. Chief Assistant Land Administrator (Development)	12 years	R4

To support the primary data, secondary data is retrieved from various articles, government documents, books, related circulars, and the National Land Code 1965 to strengthen the analysis. All the data gathered were then analysed descriptively.

RESEARCH FINDINGS AND DISCUSSIONS

Fastrack Nil Initiative in Johor Land Administration

According to R1 and R3, initially Fastrack NIL was introduced by Johor Land Administration due to the restructuring of the new rate of quit rent enforced on 5th December 2019 and subsequently gazetted by JPU 49 on 1st January 2020. Within the first five days of the enforcement, Johor Land Administration has received numerous feedbacks from the landowners as well as among the community leaders regarding the new rate of quit rent especially for land stated as 'NIL' that increased dramatically compared to the previous rate before the restructuring.

To address the issue, Johor Land Administration has taken an approach in initiating a special campaign to encourage landowners with land stated as 'NIL' to apply for the imposition of conditions in accordance to the actual land use and category on the land whether agricultural, building, or industrial and thus restructuring the amount of quit rent imposed on the land to the current market value. On 11th September 2019, Majlis Mesyuarat Kerajaan Negeri Johor has agreed to apply the 'Approval Over Submission (AOS)' initiative for application to impose conditions, land conversion, or application for additional conditions from 'Nil', agriculture (nil) to agriculture (tree) within one (1) working day. Thus, the imposition of express conditions from nil to building (residential or commercial) or industrial through the fast-track process is another additional initiative to the AOS.

From the interviews, all respondents R1, R2, R3, and R4 agreed that Fastrack NIL is an initiative for the landowner (with land stated as 'NIL') to apply for the imposition of conditions from NIL to the actual category on land whether residential building, commercial building, industry, or agriculture (tree). Currently, the application to impose conditions from none to other conditions based on the land use category set by NLC will be submitted to the District Land Office where the application will be referred to obtain reviews from the department or technical agency as well as internal review by the Assistant Land Officer. However, some of the reviews from the department or technical agency were delayed and caused the process to impose conditions or land conversion taking longer time for approval. The application will then be raised for the consideration of the Jawatankuasa Hasil Bumi, which will then be brought to the Majlis Mesyuarat Kerajaan Johor for approval. This process is simplified as illustrated in Figure 1.

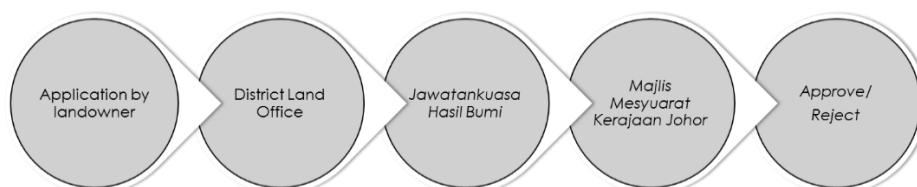


Figure 1: The application process to impose conditions from none to other conditions based on the land use category set by NLC

As a result of the quit rent restructuring, the imposition of land category and conditions on the land in question must be done immediately so that the actual quit rent can be applied. Thus, the current approach in processing the application required modification to expedite the process. The trial period of Fastrack NIL implementation through a special campaign lasted for three months, from 1st January to 31st March 2020 and the Director of Land and Mines Johor is allowed to extend the period as where it seems appropriate.

Respondent R1, R2, R3, and R4 have ensured that they are four main benefits offered by Fastrack NIL initiative to landowners. They are:

- i. Landowners can submit the application to impose conditions directly by themselves to the District Land Administrator without appointing a licensed surveyor to apply on their behalf. Thus, the application cost bear by the landowner can be minimized greatly;
- ii. The application will be processed within seven working days compared to the current process in practice that takes a longer time to approve;
- iii. Landowners can proceed for the application without having to pay the current quit rent according to the NLC provision under Section 124 of the code; and
- iv. Landowners with land stated as 'NIL' are not required to pay a higher amount of quit rent once the application is approved.

The Consideration of Zoning Compliance in Fastrack Nil Application Process

Based on the interviews conducted with respondent R3 and R4 from PTJB, Fastrack NIL application from nil to building residential, commercial or industrial can be initiated when application is submitted to the District Land Office (PTD) is completed together with the fee (RM200 for residential, RM1000 for commercial and industrial) and related documents required. The application received by PTD does not require any reference to other technical departments where any conditions or requirements of the technical department will only be imposed when a development plan such as Pelan Bangunan (PB) or Kebenaran Merancang Pendirian (KMP) is submitted to Local Planning Authority (PBPT).

Respondents R3 and R4 have a similar point of view, they think the application to impose conditions or land conversion does not require planning consideration. The provision under Section 124 of NLC and Section 2 of Act 172 has clearly stated that the imposition of condition or land conversion is not a form of development that requires planning input. Respondent R3 further explained that planning input can simply be referred to as compliance to the zoning. Legally, the imposition of conditions or land conversion according to Section 124 of NLC cross reference with Section 2 of Act 172 does not need to be in accordance with the zoning. However, this practice is becoming a norm due to the equitable interests hold by landowners and taking into account the interest of the state, thus zoning in the local development plan must be considered in the Fastrack NIL application. Therefore, application submitted must include certified zoning on the site applied from the PLANMalaysia Johor or a local authority, in addition to the documents showing the applicants confirmation of the building located on the site through a statutory declaration letter (for the individual landowners) together with company resolution certified by the company secretary for a company's application.

At this stage, the landowner is allowed to submit an application without having to pay the current quit rent as a requirement to give room for the landowner to be charged with the amount according to the actual land conditions. However, the current quit rent (new rate) must be paid together with other payment in Form 7G. The application of Fastrack NIL for residential building, commercial, and industrial is done through the power of approval given to the District Land Administrator or Small District Land Administrator regardless of Land Office Title or Registry Title. A complete application will be processed and a result notification with 7G Notice will be issued within seven working days from the date of the application received. Respondent R4 added, in accordance with the Fastrack NIL implementation, the approved application will be charged as a premium as per JPU 94 Schedule VII of the Johor Land Rules where the premium together with other approval fees must be paid within 30 days from the date of Notice 7G. This process will be done similarly to the Fastrack NIL for commercial and industrial.

CONCLUSION

The implementation of Fastrack NIL is an approach to encourage any land that is still subject to use under Section 53 of NLC, namely lands that were alienated before the commencement of NLC to be subjected to land categories and conditions in accordance with the provisions of Section 52 of the code whether it is agricultural, building (residential or commercial), or industrial category. The implementation of this initiative is in line with one of the intentions of Johor Land Administration and Section 124 whereby landowners can submit the application for the consideration of State Authority to impose land category and conditions

based on the actual development on land so that the quit rent charge is a reasonable amount. The main catch is the approval will be given within 7 days only from the date of a complete application is received. This approach is to show the commitment and continuous efforts of the Johor Land Administration in improving the level of service delivery in land matters and to achieve the utmost level of customer satisfaction, especially among landowners who contribute to the revenue of the State Authority.

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IDENTIFICATION OF THE DEVELOPMENT CHARGES EXEMPTION CRITERIA ON SUBDIVISION AND PARTITION FOR SMALL DEVELOPMENT APPLICATION ON AGRICULTURAL LAND

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Abstract

In Malaysia, issues of the development charges imposition by the Local Planning Authority arises when it comes to a land conversion by means of surrender and re-alienation with the purpose of subdividing the land to family members. Therefore, this article aims to identify the exemption criteria of development charges for the subdivision and partition among family members by referencing its administration in Johor. The method used in this study is a face-to-face interview with six respondents from land administration and development practitioners. As a result, the criteria firmly stated that the development charges exemption will be applied for the purpose of a gift within the family members through the proof of direct linear relationship between the co-proprietors with particular conditions that shall be adhered to. Through this article, the development charges exemption execution may provide insights that can facilitate the co-proprietors and jurisdictions in Malaysia regarding multiple land ownership issues.

Keywords: development charges, land subdivision, non-development land, multiple land ownership, land administration, sustainable land management.

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INTRODUCTION

In general, development charges are fees imposed by the local planning authority on any approved project which amounts to the conversion of land used, i.e., if there are any changes of land use in the title, changes in land use zoning, changes in density, as well as changes in plot ratio (floor area). Basically, the main purpose of the development charges is to provide and improve infrastructures, public facilities and amenities, as well as the wellbeing of development areas (Rahman et al., 2017; Barton and Tsourou, 2000). Referring to the general term of the provision of development charges and with reference to Section 32 of the Town and Country Planning Act 1976 (Act 172), any land development which amounts to any increase in value because of change of land use is subject to development charges. However, the issues arise as to where the imposition of development charges is imposed by the local authority in most areas of land development, particularly in subdivision and partition. Therefore, an issue occurs as to what extent do these development charges apply to a land conversion by means of surrender and re-alienation, with the purpose of subdividing the land to family members. This study explores and analyses the significance of criteria identification in granting development charges exemption to overcome the issues and challenges of subdivisions and partitions of small-sized agricultural land for non-development and granting within family members purposes.

RESEARCH BACKGROUND

Difficulties in obtaining separate ownership of land that is owned by multiple masters or many owners has left the land abandoned and undeveloped. The difficulties in managing the land occurs when the owners often create disputes among themselves, and the situation becomes more difficult if the owners do not have any family relationships. Hence, the national land legislation has come up with an alternative for the landowners to either subdivide or partition their respective plots with the provisions under section 135 and section 140 in NLC 1965.

Subdivision in general refers to a situation where a piece of land is subdivided into a few lots where this subdivided lot will be registered with a separate individual title (Libbis and Lenshinky, 2006; Awang, 1997). It means, if one brings a registered proprietor or a piece of land and later by virtue of Section 135 - 139 National Land Code 1965 (NLC 1965) per se, or by virtue of Section 197 cross refer to Section 76 NLC 1965 by means of process of subdivision and variation of land use. There will be a few lots created based on these two processes in which every plot will still be registered under some registered proprietor. However, a conflict arises as to where the purpose of the subdivision is for family subdivision, but the proprietor will then be imposed with development charges by the Local Planning Authority.

Given a situation where a piece of land at an acre intended to be subdivided to seven family members with the existing category of land use as agricultural, and the zoning in the local plan is for building. Procedurally, this application for subdivision would require an input from the planning authority and as the zoning differs from the land use category, this kind of subdivision per se would be rejected, unless and until it is submitted together with variation of land use. To have the piece of land subdivided and varied, the category of land use i.e., from agricultural to building, this kind of application would require a layout submission to the Local Planning Authority. The application which procedurally needs to be submitted through the One Stop Centre (OSC) at the Local Authority would then be subjected to certain requirements by a few technical agencies in which the issue regarding access Section 136(1)(h), requirement of Pre-Computation Plan Section 137(1) is required. As this application involves a variation of land use i.e., from agricultural to building (residential), therefore an imposition of development charges would be imposed.

Another issue to be discussed here is the requirement for approval of the planning authority in case of partition. No doubt, by virtue of election Section 141(1)(c), as in subdivision, the approval from the planning authority is required but to a certain extent, this planning authority has gone beyond by imposing a condition that the application of partition needs to be by planning permission submitted to the OSC, when in fact they should just get the plan for the partition endorsed.

In general, the law has clearly stated under Chapter 2 of Part Nine NLC 1965 that the co-proprietors of land held under a find title or a qualified title in continuation of find title, can have the land held by them partitioned so that every co-proprietor can have a separate title to themselves. Undoubtedly, it is subject to certain conditions imposed to ensure that the partition is done in an orderly manner to avoid any other consequences which may arise later. However, the spirit of partition is not a development in the first place. It is merely a process to terminate the co-proprietors registered under the same title.

In the case of partitions involving land with the category of agricultural held by a few co-proprietors, where the zoning in Local Plan is residential zone, and permissible area of each of the partition portions according to its original use (agricultural) is less than an acre each. Thereby, with the comment of approval from the local planning authority as required by Section 141(1)(c), would lead this application to be submitted through the planning permission by virtue of Section 22 of Act 172.

Records have shown that this kind of application is required to be applied together with the variation of land use and this is again, where the proprietors are traumatised by the expected development charges. This has

resulted in the withdrawal of proprietors from continuing the submission of their application.

LITERATURE REVIEW

According to the Town and Country Planning Act 1976 (Act 172), all developments are obligated to obtain the approval of planning permission from the Local Planning Authority before any development activities may be conducted (Maidin and Ali, 2009; Othman, 2000). Three categories of development requires an application for planning permission, namely small development, medium development, and large development. Subdivision, partition, or amalgamation of land (agricultural land) which is less than 2 acres and does not involve any building or development activities fall into the small development category. Procedurally, for the purpose of subdivision or partition among the proprietors, they are required to apply for the approval of planning permission and will be imposed development charges in accordance with Subsection 32(1) of Act 172 as this application involves a variation of land use.

In Malaysia, imposition of the fees is determined by the Local Authorities, whereby the approved fees shall be gazetted as required by virtue of Section 35, Act 172. The amount of development charges may vary from one state to another, or even among the local authorities in the particular state. The determination of development charges is with respect to the changes of land use, the density changes, and the floor area changes which amount to the increase of value. The charges are charged based on the difference in the value of the land, before and after development. Table 1 below shows the difference in fees imposed by a few states:

Table 1: Percentages Imposition of Development Charges by State Authorities

Side PBT	States					
	Selangor	Perak	Kelantan	Kedah	Pahang	Johor
Development Charge Rate (%)						
City Council	30%	10%	-	20%	20%	25%
Municipal Council	30%	10%	15%	20%	15%	15%
District Council	20%	10%	10%	20%	10%	10%
International Zone						30%

Source: Johor Land Administration, 2021

Procedurally, development charges will be imposed after the planning application has been approved by the Local Planning Authority in the process of planning permission approval as shown in Figure 1. Applicants may apply for development charges payment via instalment. If rejected, they shall pay the fees via one-off

payment. Planning permission will be granted after the Local Planning Authority is satisfied with the first instalment payment pursuant with Subsection 22 (4)(b) of Act 172.

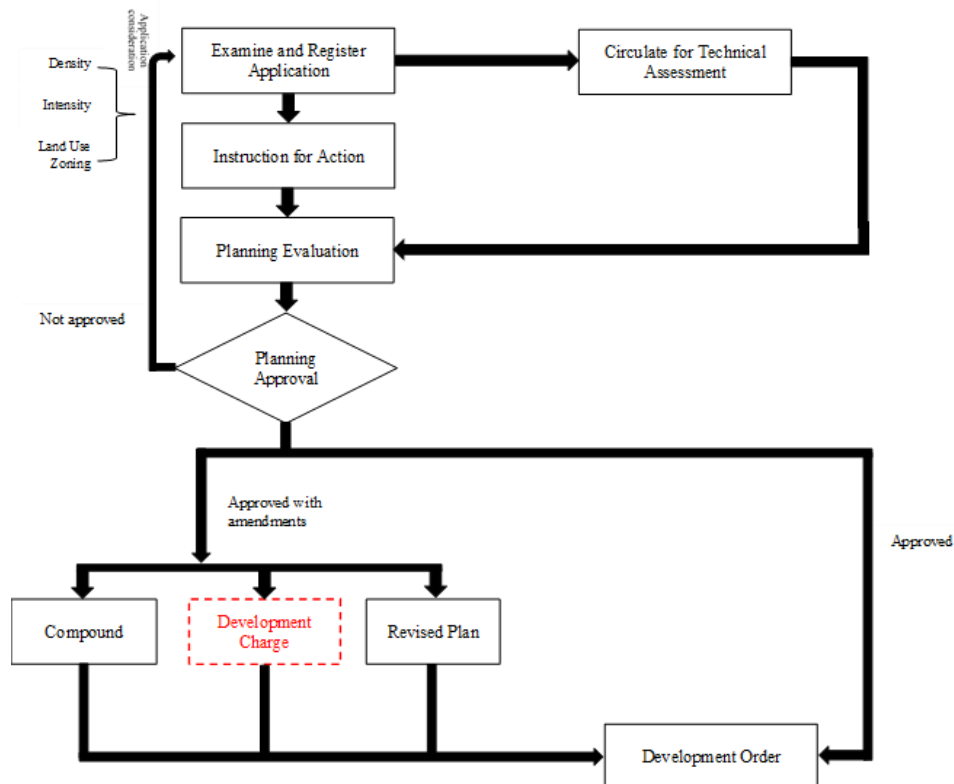


Figure 1: The Position of Development Charges Imposition in the Process of Planning Permission Approval (PLANMalaysia Johor, 2018)

Nevertheless, the State Authority may exempt the development charges that is non-profit in accordance with Subsection 32(3) of Act 172:

- i) Development for welfare bodies' purposes by government agencies or non-governmental bodies (NGOs) registered;
- ii) Welfare bodies and other organisations recognised by the government;
- iii) Government buildings;
- iv) Public stall buildings and food stalls;
- v) Public religious projects; and
- vi) Other development purposes approved by the State Authority.

While the Local Planning Authority is the jurisdictional body to grant the planning permission approval, the State Authority is given the jurisdiction to approve subdivision and partition applications if the land applied for agricultural purposes with conditions: i) for subdivision – each partitioned lot is not less than 2/5 hectares or an acre, meanwhile ii) for partition – the applied agricultural land must be less than 2/5 hectares or an acre. The applications shall be made through Form 9A (Section 137) and 9B (Section 142) NLC 1965 respectively, and the State Authority will process the applications through surrender and re-alienation adherence.

METHODOLOGY

This study applied the qualitative method and Johor was selected as a case study. Primary data were collected via in-depth interviews consisting of six experts from land administration and development field, which two land administrators from Johor Land and Mines Office, a land administrator from Johor Bahru District Land Office, a land administrator from Kuala Lumpur Federal Territory Department of Lands and Mines, a land administrator from Negeri Sembilan Land and Mines Director Office and a representative from industry player. Interviews conducted on two land administrators from Kuala Lumpur and Negeri Sembilan are considerably important in regards of this new approach being introduced in land administration practice. Meanwhile, secondary data were collected from the analysis of the relevant statutes, rules, regulations, books, as well as related journals. This study specifically used data analysis, writing method through revision, and reading and listening to recording data collected during interviews. This study also initially analysed the interviewees' perceptions and insight regarding the criteria identification of development charges exemption on subdividing the land to acquire individual titles for non-development purposes and grants within family members in the context of Johor.

RESEARCH FINDINGS AND DISCUSSIONS

Criteria Identification for Development Charges Exemption on Subdivision and Partition

Based on the interviewees' reviews and opinions, the results of discussions can be divided into four themes in determining the criteria for the exemption of development charges on subdivision and partition for non-development and granting to family members purposes. Table 2 summarises the discussions among the interviewees about the criteria's determination.

Table 2: Summary of Interview Based on the Requirement of Development Charges Exemption on Subdivision and Partition Determination

Theme	Discussions
Existing Practice	<p>“...The common development charges benefit the developers to gain the higher profit. In this context, family members will be able to gain the profit.” (R1)</p> <p>“...However, if we subdivide the land using the common method which is the agricultural land use will be converted into residential land use, it will cause the agencies to disagree. Or if it remains as the agricultural land, it will involve other aspects. So, when the co-proprietors want to proceed the subdivision with land conversion, by law, they will be charged with development charges, even though there is no commercial purpose in the process, and the co-proprietors simply just want to get their registered divided plot, respectively. Therefore, state authority took the initiative in introducing the exemption of subdivision and partition within the family members to facilitate the process.” (R2)</p> <p>“...In principle, the agricultural land use will remain unchanged as it is, and because the size of the land is chronic, co-proprietors shall go with the application of subdivision and partition simultaneously, from agricultural land use converted to residential land use.” (R3)</p> <p>“...The innovation of development charges exemption onto agricultural land which is less than 2 acres for the purpose of subdivision and partition provided by state authority is not opposing the law. However, from the sight of a valuer, the elements in determining the exemption shall not affect the value of land i.e., land transaction or business or commercial land development - these types of development should not be exempted from being imposed development charges because it will affect the value of properties in the future...In terms of process, it is not opposing the law.” (R4)</p> <p>“...As far as I am concerned, state authorities in Malaysia practice the common concept of development charges, which means all land development application has to go through the common process of planning permission because if not, it will cause a higher royalty payment to the developers.” (R5)</p> <p>“...Under the circumstances that the proposed subdivision is approved, the Land Administrator, or the State Director of</p>

Lands and Mines (PTG), or the State Authority shall consider the application and make appropriate decisions based on the merit of each application. If the application involves 2/5 hectares of agricultural land or less, then the State Authority may approve it either without conditions and modifications, or reject as provided by section 143A NLC 1965 (2008 amendments).”

(R6)

The issues

“...Johor Land Administration have found the solutions regarding the matter due to:

- i) Many appeals involve subdivisions and partitions among family members; and
- ii) The trend of subdivision and partition entry was declining because the co-proprietors knew they will be imposed development charges the moment they make the application.”

(R1)

“...the issue that will arise in the future is once they want to build a house, they need to submit a planning permission because residential land use is subjected in preparing reports of side back, drainage facilities, road facilities – all accessibilities are required especially for the intermediate lots and behind the main road.”

(R4)

“...This is the rationale of why NLC 1965 requires subdivision and partition to obtain the approval of planning authorities as per the conditions for approval of subdivision and partition under subsection 136(1) of mutatis mutandis with several modifications. However, the approval is not in the form of planning permission or planning order, because these two processes are not land development.”

(R6)

Justification of the exemption

“...We want to encourage the prospect of land development in the future and assisting the co-proprietors and people of Johor in managing their respective land.”

(R1)

“...The initiative has been taken because we have learnt what is happening to Kampung Baru. The reason why we came up with the solution was because we wanted to prevent subdivisions and partition’s co-proprietorship elimination.”

(R2)

“...We might lose the benefit of development charges, but the exemption will benefit the state and local authorities through

other charges, which increase the value of land tax and property tax according to the subject matter.” **(R3)**

“...The advantage of this exemption may benefit the co-proprietors because the ownership of each subdivided plot is more apparent and proven...” **(R4)**

“...So, in my opinion, the innovation issued by the Johor Land Administration is one step ahead and is such a good approach to let the land grow and develop to the best use, rather than being abandoned. In addition, state and local authorities can collect the revenue on the developed land compared to the undeveloped agricultural land.” **(R5)**

Solution

“...That is why the Johor Land Administration stated the conditions of subdivision and partition have to be within the circle of family members. How do you determine the circle of family members? Among the conditions are the applicant must gain the approval of family members’ consent, letter of declaration, an endorsement in the registrar’s caveat when registering the title, and no activities of sale and purchase within a certain period.” **(R1)**

“...So, how we are going to tie the development charges’ exempted subdivision and partition land from being revoked? There are two arguments:

- i) subdivision – if a sole landowner wants to divide his land up to ten partitions, then the new ten divided plots will be under the name of the sole landowner. So, in regard to preventing the plot from being sold, the verified names of the family members will be inserted in the registrar’s caveat which will be released after the process of transferring ownership to the family members specified in the original application is completed.
 - ii) partition – the transactions of registered title for respective proprietors in computerised land system and the copy of original title, which is not disclosed in computerised land system, will be recorded as the proof of ownership.” **(R3)**
-

Based on the discussions above, the requirement of development charges exemption on subdivision and partition within family members were needed solely to facilitate the co-proprietors to get their respective divided plot and to prevent the elimination of co-proprietorship as well, so that they can manage and develop their respective land with their respective way, appropriately and legally. Besides, this development charges exemption also can prevent the land with

multiple co-ownership being abandoned and poorly managed which state authorities alarmed that it may arises a diversity of string issues in the future. Therefore, to mitigate the issue between the requirement from planning authority and the interest of the public at large, who are not developers, a few conditions have been laid down so that the proprietors who are not developers can be exempted from the imposition of development charges.

Requirement Conditions for Implementation of Subdivision and Partition Application Approval for Non-Development and to Family Members Purposes Based on Johor Land Administration Practice

The application of subdivision and partition which requires the compliance to the zoning can be entertained and considered by the State Authority, either by complying to the prevision itself or by means of surrender and re-alienation. Surrender and re-alienation is a land development process which allows the process of variation of land use and subdivision to be done simultaneously. This is where the three processes, namely subdivision, partition, and variation of land use need to be submitted through planning permission application at the local planning authority and later proceed with the surrender and re-alienation.

With surrender and re-alienation, land officials either at the district land office or at the land and mines level would give recommendations to this application to determine that this application is purely for the purpose of subdividing to the family members, as well as terminating the co-proprietorship by means of partition. This means that the registered proprietors do not have to proceed with the process of variation of land zoning which would be time-consuming and costly.

The process of subdivision per se, particularly subdivision to family members and partition shall be treated differently, either by its process or its prescribed fees. The process shall be less complex than a typical subdivision whereby the aspect of zoning classification compliance as in the local plan may need to be changed, rezoned, or up to the extent of distinguish with. Table 3 below highlighted the requirement conditions or criteria for the development charges exemption for particular subdivision and partition, which strictly executed for the purpose of non-development and as a gift or grant among family members.

Table 3: The Requirement Conditions of Execution for Development Charges Exemption on Subdivision and Partition for Non-Development and Within Family Members Purposes

Land Development Process	Conditions / Criteria
Subdivision	i) A family subdivision is defined as division of a lot into a few lots for the purpose of sale or a gift to a family

- member, or members of the immediate family to the property owner.
- ii) An immediate family member is defined as any person who is naturally or legally defined as a sibling, child, stepchild, grandchild, spouse, or parent of the property owner.
 - iii) Proof of kinship in the form of a birth certificate similar to a legal document is required before approval can be granted.
 - iv) A division of land solely among direct lineal descendants (parent to child only) and a direct lineal ascendant (child to parent only).
 - v) A lot created through this application is not eligible for sale to any other persons as the listed names of family members is endorsed together with the approval.
 - vi) A registrar caveat will be entered upon registration of the new subdivided title to ensure that compliance to condition is adhered with.
 - vii) A completed Statuary Declaration which states that:
 - The subdivision is intended to keep the family estate within the family and not for the purpose of short-term investment. Therefore, the listed names of family members shall be as exhibit to the Statuary Declaration.
 - Once a transfer is perfected or from the approval property owner to the listed names of family members, there will be a restrictive covenant on the subdivided property that would prohibit the transfer to a non-member of the immediate family for a period of 10 years.
- Partition**
- i) The co-proprietors shall establish that he has owned the property for at least 10 years prior to the application.
 - ii) The co-proprietors by transmission either by Small Estate Distribution order or court order, shall be exempted from complying with the duration of holding the ownership.
 - iii) The partitioned lot in general cannot exceed the number of co-proprietors as registered in the title. However, it is negotiable if there is a need for the partitioned lot to be more than the co-proprietors in the event of any road, river, and pipeline shown clearly in the plan.
 - iv) The partitioned lot can be less than the number of the co-proprietors provided that the remaining co-proprietors agreed with the undivided portion in terms of areas, acreage, and locality which needs to be shown and signed on the partitioned land.
-

Source: Johor Land Administration, 2021

From the discussions above, the conditions firmly stated that the development charges exemption for subdivision will be applied for the purpose of gift or sale within the family members only. This means, to ensure the process of granting the plots through subdivision can be exempted from being charged with development charges, the land owner(s) and the prospective subdivided plots owner(s), shall prove their direct linear relationship through legal support documents. In the other words, the exemption will not be applied if the subdivision purpose is involving the parties with indirect linear relationship, not to mention the non-relative's relationship. In the other hand, the development charges exemption for land partition only will be applied to the non-development purposes as it should complied with the variation of the agricultural land use. By law, the co-proprietors should have their own title deed for their portion of the land and commonly, the partitioned lots are allowed to exceed the number of co-proprietors registered. Therefore, to ensure that no land partition process to the non-proprietors will occur in the future and the registered co-proprietors are able to manage and develop their own respective portion of the land, they shall proceed to submit the planning permission but this time, no development charges will be imposed. Through this exemption process, the co-proprietors can secure their ownerships as well as obtained the separate title deed.

CONCLUSION

Johor has come out with this development charge exemption approach after identified the issue of difficulties in obtaining the ownership of land that owned by many owners especially those cases related to family relationships. An exemption shall be appreciated in the case of land conversion to family members as well as a partition, either by the process of partition per se or partition with the variation of land use to compliment the requirement of land zoning. Hence, those highlighted conditions shall be adhered to for this purpose. This execution of development charges exemption for particular purpose will facilitate the application process of subdivision or partition in accordance with the NLC 1965 and moreover, as a solution to many abandoned or undeveloped land because of said circumstances.

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THE VERTICAL LAND USE ZONING FOR UNDERGROUND SPACE DEVELOPMENT IN MALAYSIA

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Abstract

There is a demand for the development of underground space beneath alienated land by a third party other than the surface landowner. Arguments frequently arise because the surface landowner asserts that his rights extend to ownership extension, while the other party wishes to develop the underground space without interfering with the rights of others. Due to Malaysia's absent of land use zoning for underground space, the rights to develop underground space are ambiguous. Using a qualitative approach, this study will examine the role of land use zoning in assisting the development of underground spaces. Thematic analyses revealed three interconnected elements: underground land use zoning, standardisation of land category depths, and a buffer zone for surface and underground space ownership. Additionally, a comparative study was conducted between Malaysia, Hong Kong, China, Japan, and Finland in order to determine the optimal strategy for zoning underground space land uses. At the conclusion of this paper, vertical land use zoning was also proposed.

Keyword: underground space, vertical planning, underground land use zoning, comparative study, qualitative study

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INTRODUCTION

The terms 'underground space' or 'subsurface' refer to any space beneath the earth's surface, whereas the term 'surface area' refers to the area above the earth's surface (Ronka et. al., 1998). Initially, people used the underground as a part of the caves, where they used it as a shelter from the rain, heat, and threat of wild animals in addition to providing a place to stay. They began to use the basement for living, storage, property disposal, and mining as the evolution progressed. This demonstrates that underground space, particularly in urban areas, can be used for any type of land use and development. Thus, the construction of underground infrastructure appears to be a requirement in tandem with a city's rapid growth (Chow et al., 2002). There is no doubt urbanisation give benefits to the communities (Samat et al., 2019) also lead to economic and social development (Rosni et al., 2016) but it comes with a high demand for infrastructure, residential, and commercial development. However, because surface space is limited, underground space can provide a new and alternative space for development. For example, it will create additional space for the development of infrastructure, utility services, and other purposes unrelated to the above-ground land use.

However, Malaysia's urban plan lacks land use zoning for underground space development. While the majority of underground space development is for public purposes, commercial development is also in demand. The purpose of this article is to examine the land use zoning and development considerations associated with underground space development. The output will detail the elements required for vertical land use zoning, which will aid in the future planning of underground space.

THE FUNCTION OF UNDERGROUND SPACE

Because urban areas are densely populated, underground space is frequently used to open up a development and alleviate urban issues such as a lack of open space and traffic congestion. Underground space development is critical in making underground spaces one of the solutions to urban problems (Sterling, 1996; Pandey 2019). Not only does added value provide solutions, but it also contributes to sustainable development, and improving environmental conditions also improves the quality of life in cities. Thus, we cannot deny the importance of integrating underground space use into urban planning (Mavrikos & Kaliampakos, 2007) while also safeguarding underground space resources (Zerhouny et al., 2018).

Urban underground space users can be classified into two types: functional infrastructures and passage and living spaces (Li, 2013). Functional infrastructures are more likely to be pipeline-related, underground storage-related, or utility tunnel-related. Meanwhile, passageways and living areas are concentrated on the subway and underground pedestrian route. Underground space is primarily used for municipal purposes, transportation, and environmental and deepening

purposes (Hehua, et.al., 2017). Tunneling is not the only use of underground space, as its potential is much greater. We can see evidence of the limitless use of underground space throughout the world, as summarized in Table 1.

Table 1: Urban Underground Space Development around the World

Category	Development
Facilities and Infrastructure	Underground Trash Collection, Netherlands Nagoya Sakae Park Oasis, Japan Tokyo Underground Drainage Network, Japan Deep Tunnel Sewerage System, Singapore
Building	The Louvre, Paris Underground Science City, Singapore De France City Development, Paris Montreal City, Canada
Transportation	Boston City Big Dig, USA Delhi Metro Project, India Kallang Paya Lebar Expressway, Singapore Mass Rapid Transit, Malaysia
Tunnelling	Versailles (Innovative road tunnels), Paris

However, not all sites, functions, and structures are suitable for underground development, as they must meet certain criteria (Sterling and Godard, 2000). As with surface development, developing underground space requires consideration of several factors, including the type of utilization, the implication of applicable laws and policies, technical aspects, the environment, and also social and economic factors (Goel et al., 2012).

METHODOLOGY

This article applies the qualitative study. Thus, the discussion in this article is a hybrid of empirical and comparative research. For the empirical study, a pure qualitative approach was used. The respondents were chosen using a non-probability sampling technique. Purposive sampling was used to select interviewees. Thus, purposive sampling appeared appropriate for this study, as the sampling strategy for selecting respondents for the study area is limited, and only a select group of individuals can respond to interview questions about underground space land use zoning. Five (5) respondents from various agencies with experience in land administration and development participated in the interviews. Table 2 lists the respondents.

Table 2: List of Respondents

Code	Agency
R1	Jabatan Ketua Pengarah Tanah & Galian (JKPTG)
R2	Jabatan Ukur & Pemetaan Malaysia (JUPEM)
R3	Land Expert
R4	Dewan Bandaraya Kuala Lumpur (DBKL)
R5	Pejabat Tanah dan Galian Kuala Lumpur (PTGKL)

The interviews were conducted using semi-structured interview questions. The questions were formatted using a descriptive approach and were based on information about land use zoning and development in Malaysia. The feedback gathered has allowed for a comparison of the collective perceptions of personnel from various government agencies, industries, and land-related experts. The data were analyzed thematically, and the results were used to identify critical components of underground land use zoning, as well as make suggestions and recommendations for improvement.

Meanwhile, Japan, Hong Kong, Finland, and China were chosen for comparative studies due to their excellent examples of vertical land use zoning. While our legislation is distinct, from a geological standpoint, their vertical land use planning is extensive and serves as a model for Malaysia.

According to Lor (2012), comparative studies fall into three categories: single-country studies, few-country comparisons, and many-country comparisons. The amount of abstracted data or information varies according to the number of countries included in the comparative study. Generally, single-country studies and comparisons of a few countries employ qualitative approaches, while many-country comparisons employ quantitative methods (Lor, 2012). In comparison to few-country comparisons, data extraction in a single-country study is typically more extensive and entails in-depth talks. While the cross-country comparisons concentrate on the correlations between variables that are conceptualised and quantified superficially.

As a result, this study used the strategy of few-country comparisons. Due to the lack of a mechanism for underground land development, the four countries were chosen to be reviewed, compared, and discussed in order to examine the components of vertical land use zoning of underground space development, which are: the need for underground land use zoning, depth standardisation, and the buffer zone in vertical land use. Meanwhile, the tactics

used to develop underground space in various nations are being evaluated in order to identify best practises that may be used to improve our system.

THE ANALYSIS: UNDERGROUND LAND USE ZONING

Three critical factors that will contribute to the development of vertical land use zoning are discussed in this article: the need for underground land use zoning, the standardization of depth, and the buffer zone in vertical land use. This section discussed based on qualitative study: in-depth interview and comparative study. Before we discuss further, Table 3 summarize the comparative analysis for Japan, Hong Kong, Finland and China based on components of vertical land use zoning.

Table 3: The Summary of the Comparative Analysis

Components	Finland	Japan	Hong Kong	China
The Restrictions on Development	The underground space development is restricted by the municipal building regulations and the land use planning.	Since the landowner own 40 meters below, after the depth it can be utilized for other development. However, it is restricted for the purpose of public project only such as infrastructure	The practice only allows the underground space to be developed under the un-alienated land and for the purpose of public project only	The underground space development is restricted based on the vertical underground space zoning
The Depth's standardization	Even though the depth of development is not standardized, six meters underground is considered as the depth that the surface landowners can utilize	The Basic Law of the Deep Underground Space gazette allow the deep underground space utilization under the alienated	The underground space development can be more than 25 meters deep. The depth of development in Hong Kong depends on the utility, type and location	The depths of development are divided by the layer based on the use and level. It is monitored by the Construction Bureau in each region
The Underground Space	The government has reserved	The Law on Special Measures	The HKPSG have the special	The land use guidelines and procedures are

Utilization and Land Use Zoning	<p>the rock resources in present for unclassified future use of underground space constructions. The reason is to identify the good sites for the functions that are suitable for locating the underground land development</p>	<p>Related to Public Use of Deep Underground and the basic policies provide the legal and administrative guidelines in developing the underground space. It is subjected within the power of Deep Underground Use Council</p>	<p>section for the rock cavern development to emphasize the role of the government agency in planning and developing the underground space. The suitable zonings for the surface and underground space development is based on the Outline Development Plans</p>	<p>carried out at the local level. Independent zoning plans drafted based on the cities' need. All these zoning plans govern the issuance of land use rights and building permits, as well as the regulation of land development, the Law on Administration of Urban Real Estate, comprehensive land use plan, annual land use plan, annual real estate development plan, and urban zoning plan.</p>
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The Need of Underground Zoning

Underground space, without a doubt, has the potential to be developed in the future. However, Section 92 B, Part Five (A) of the NLC Act 828 states that the underground space does not reflect the land use above. As a result, a master plan for the development of underground space must be created. The proposal to classify land use according to depth and specific boundaries in order to facilitate future development has elicited a range of responses from respondents.

Vertical underground zoning has been agreed upon by R1, R4, and R5 based on land use category, existing and surrounding development (land economy), and future development. This is because zoning and development of surface land is relatively straightforward, whereas underground space development is quite difficult. At the moment, Kuala Lumpur's zoning does not

include a strong draft plan for underground space development. However, respondents suggested that in order to avoid conflicts between surface and underground landowners, it would be preferable if development were restricted to infrastructure and utilities. Additionally, R4 reports that Kuala Lumpur is now investigating trenching utilities. When trenching utilities are shared, underground utility services and providers avoid the need to dig up the land multiple times to gain access to the underground. They simply need to share the access and establish their services. Apart from reserving space for green space, undergrounding utilities contributes to more structured and orderly urban planning.

However, R2 and R3 opposed vertical zoning, believing that future developments could not be predicted. According to them, current trends may become obsolete in the future. They agreed that Malaysia does not need to specify the underground space in terms of layers (zoning) or restrict development; instead, they should leave it alone and adhere to existing rules, regulations, laws, and development frameworks.

Based on the discussions, this study concurs with R1, R4, and R5 regarding the importance of developing a vertical underground space zoning ordinance to serve as a guideline for urban development. This is because rapid urbanization, whether we like it or not, necessitates underground space to support the growth of a city, such as expanding utilities and infrastructure. While the zoning is not as precise as that of surface land, the underground space utilization layers serve as a guide for development. As agreed with the respondents, zoning should be limited to infrastructure projects such as tunneling or utilities such as pipelines.

The Proposed Buffer Zone in Vertical Land Use Zoning

For underground space zoning in Japan, private land or property rights are limited to 40 meters below ground, at which point the underground land can be used for other purposes. Thus, the government must construct underground facilities on public property or land to avoid paying a hefty sum for privately owned underground property rights under current law. The 'Law' establishes the boundaries of vertical property rights, which serve as the basis for authority decentralisation from the national to the prefectural level. In the case of Hong Kong, the government established a buffer zone between properties, both horizontally and vertically, because support rights are not recognized in Hong Kong under common law. It is critical to establish a buffer zone because development may have an effect on the development rights granted and the associated liability.

According to a review of the countries, the bundle of surface land rights also applies to underground space. To facilitate development, private property ownership has been limited in Japan to 40 meters below ground, while Hong

Kong has established a buffer zone between the layers. According to the respondents, restricting surface landowners' rights to use underground land, as done in Japan, is unsuitable for implementation in Malaysia. The findings indicate that it is preferable if there is no restriction on ownership extension, which means that Section 44 (1) (a) of the NLC Act 828 is valid for application.

On the other hand, this study concurs with the Hong Kong government's strategy of establishing a buffer zone between the surface and underground layers. Figure 1 illustrates the proposed buffer zone in vertical layers. The buffer zone should be determined and included during the underground space alienation process based on the type of development in both spaces. Additionally, the title must clearly state the rights in order to protect and guarantee the landowner's rights as defined in the National Land Code Act 828 and other applicable legal provisions.

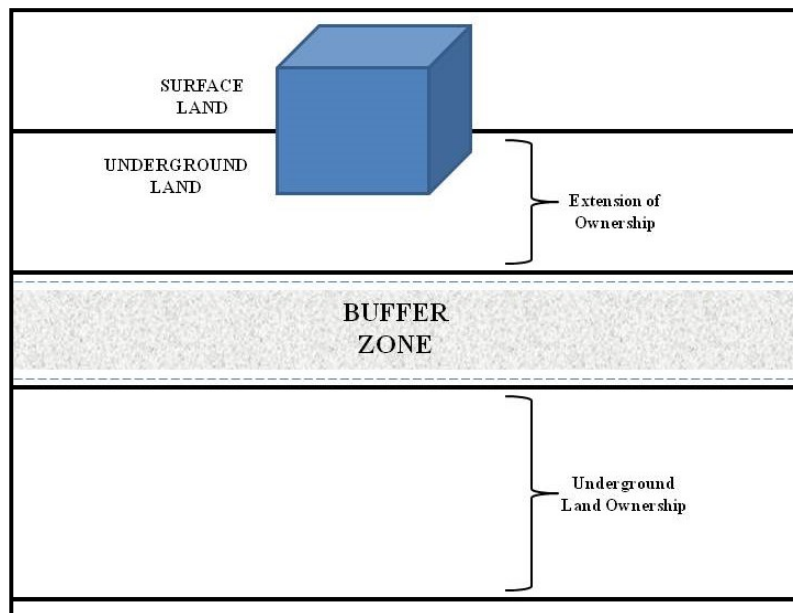


Figure 1: The Proposed Buffer Zone in Vertical Layer

The Standardization of Depth for Land Tenure

R1 and R3 did not agree on depth standardization. Even though the circular established a minimum depth, the State has yet to publish any rulings on the subject. It is not the case in countries such as Japan, which have standardized the depth of land tenure and are prepared to plan for future underground space utilization and development. It is not necessary to standardize the depth in light of Malaysia's current situation.

R2 agreed that the land, along with the standardized depth, is alienated. R4 had substantiated R2's assertion by demonstrating a straightforward situation. He noted that Malaysia's land development is extremely dynamic. While the land may be zoned for commercial use today, it may be converted to industrial use in another 20 years. Thus, if there is an underground space development beneath, determining the depth and other technical factors is quite complicated. However, if the depth is standardized, the depth remains constant regardless of the zoning. Even if the development above expands, it will not disrupt the existing development. Simultaneously, R5 endorsed R2 and R4's recommendation to standardize the depth. He agreed that if the depth of tenure is standardized, the depth of ownership can be endorsed in the land title upon its implementation.

However, upon further evaluation, this study concluded that there is no pressing need to standardize the depth of land tenure. While it must be acknowledged that underground space is critical for development, in Malaysia, its use is currently limited to infrastructure and tunnelling. While some countries have standardized the depth for the purpose of land alienation for underground development, this is due to issues of land scarcity, extreme weather, and also unforeseeable natural disasters; and the situation is quite different in Malaysia.

THE VERTICAL LAND USE ZONING

The Helsinki Underground Master Plan is one of the most frequently cited master plans for the development of underground space worldwide. The municipality of Helsinki in Finland developed a master plan for the 10,000,000 m³ underground space, reserving it for long-term development of public and private facilities. The Helsinki Underground Master Plan was implemented to promote and coordinate underground space planning and development, as well as to preserve the rocks designated for sustainable use. This is a statutory plan that details the location and allocation of underground space for utility tunnels and facilities, both existing and planned.

The underground space is one of the solutions for a city's growth because it provides a location for utilities and infrastructures. Due to Malaysia's absent of underground space planning, the findings indicate the importance of vertical underground space zoning as a guideline for urban development. However, the master plan does not have to be as meticulous as the surface land zoning. It simply needs to demonstrate at the very least the layers of underground space use as a point of reference for development. For example, the underground space can be divided into three layers: shallow, medium, and deep. One of the best examples to follow is China, specifically Beijing, where underground space is zoned in a way that is not overly detailed but is sufficient to support underground space use. In China, development is classified into four stages, with depths ranging from 0 to 10 meters, 10 to 30 meters, 30 to 50 meters, and 50 to

100 meters. The depth of development is determined by human accessibility, which in turn determines how Beijing's underground space is used.

Additionally, the findings stated that the zoning is limited to infrastructure development, such as tunneling, or utility development, such as pipelines. Figure 2 illustrates the proper way to draft the vertical underground space zoning. The Guideline for Infrastructure Utility Planning is a gazette that assists the State Authority, the Local Authority, and the developer in planning for the placement of utility lines in areas where infrastructure is transferred underground. It is only applicable to new construction and redevelopment. As a result, this guideline can serve as a foundation for the authority when it comes time to draft underground space zoning in the future.

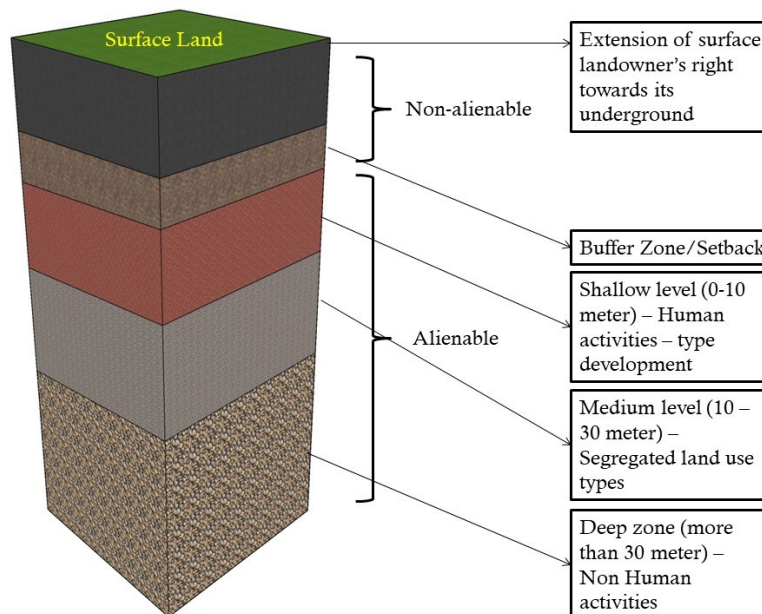


Figure 2: The Proposed of Vertical Land Use Zoning

CONCLUSION

In summary, the underground space is rich in exploration and development potential and thus has the potential to be used for the greater good of society. While the need for utilizing underground space in Malaysia is still not critical in comparison to other countries, consideration and planning should begin immediately. The study concluded that Malaysia requires vertical land use planning. Through a comparative analysis of Malaysia and the reviewed

countries, the optimal strategy for Malaysia's underground space development was determined. While Malaysia's underground space development is currently focused on infrastructure and public benefit, future commercial development is not ruled out.

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DETERMINANT FACTORS INFLUENCING HOUSING AFFORDABILITY AMONG BUMIPUTERA YOUTHS IN KLANG

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Abstract

Housing affordability issues arise when the household income is insufficient to cover the expenses of owning a house due to high housing market prices. This significantly impacts potential buyers, especially members of the youth generation who have just embarked on their careers. This study contributes to the empirical studies related to the monetary and non-monetary factors that influence the affordability of housing for Bumiputera youths in Klang. Primary data was gathered from 382 respondents using purposive stratified sampling. The findings indicate that seven main factors strongly influence housing affordability for Bumiputera youths: household income, housing price, loan approval, household expenditure, type of property, number of working households and location. Thus, the findings of this study will contribute to policy decisions, assessments and practices related to housing affordability among Bumiputera youths and support the implementation of the government policy to ensure that at least 75% of Bumiputera households are able to own residential property.

Keywords: Monetary factors, non-monetary factors, Housing affordability, Bumiputera youth

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INTRODUCTION

For every Malaysian, owning a home is now a life goal. Thus, it has become the primary concern of the Malaysian government to encourage an increase in homeownership among Malaysians. With the increasing percentage of the Bumiputera within the country's population, who now contribute 68%, compared to 62% 25 years ago, the Malaysian government stated that it was fully committed and determined that at least 75% of Bumiputera households should own a residential unit by 2020 (Eleventh Malaysia Plan, 2016-2020). Therefore, the government has initiated several initiatives to encourage Bumiputera homeownership. However, the target has still not been reached due to soaring and burdensome house prices, especially among Bumiputera youths since such house prices are unaffordable given their incomes.

Housing programmes implemented by the government provide opportunities to buy and own a house, especially for the youth generation of the Bumiputera. However, various circumstances affect the capacity of Bumiputera youths to own a home. Firstly, many youths have suffered financially during the COVID-19 pandemic. As a result, most of the youth generation cannot afford to buy and own a house due to the high financial commitment and monthly instalments. Lim and Chang (2018) emphasized that social-demographic is not the only descriptor that influences the house determinants, but what is equally essential are buyers' intentions and their financial situations. It is undeniable that various housing programmes, such as 'Rumah Pertamaku' and 'Rumah Selangorku,' have been implemented, focusing, and aiding low-income and middle-income groups. However, these are restricted to potential youth buyers among the Bumiputera since there is competition among the income group to benefit from new housing schemes. Those confined by the middle-income trap do not qualify for low-cost housing but cannot afford the medium cost of units in residential projects. Thus, the demand for that type of housing scheme is too high compared to the market supply.

Another initiative by the Malaysian government to balance the distribution of homeownership among the Bumiputera and non-Bumiputera is through implementing the Bumiputera Lot Quota Regulation. According to Abd. Rahim Abd. Rashid (2000), housing issues arose due to inequality in distributing the Bumiputera lot quota. One reason is that Malaysia's housing sector is still dominated by Chinese ethnic groups, especially in the major towns and cities such as Kuala Lumpur, Johor Bahru, Ipoh, and Penang (Bujang, Zarin & Agus, 2008). In addition, the income gap between the races has contributed to this situation. According to Ismail et al. (2015), the income of the Bumiputera is the lowest compared with the other races. The income gap between the Bumiputera and the Chinese had quadrupled to RM2,802 in 2019 since 1989 (Naz Harun, 2020). Thus, even though the Bumiputera Lot Quota Regulation under the implementation of New Economic Policy (NEP) 1971 is nearly five decades old,

Bumiputera homeownership remains low. This might be because each state has different Bumiputera quotas and affordability levels. Moreover, some locations are unfavourable to the Bumiputera market; alternatively, the pricing may not be within the affordability range of Bumiputera's purchasing capacity.

On the other hand, a study conducted by Youth Access (2007) has shown that the youth generation encounters affordability issues three times more severe than other groups. The youth generation strives to access homeownership, unlike the elderly age group who have more substantial savings, such as saving accounts, Employees Provident Fund (EPF), and other related investments. Considering the matters that have been discussed, the housing affordability issues among the youth generation of Bumiputera's, especially those in urban areas, remain unsolved and need to be settled. Therefore, the objective of this study is to determine the factors that influence housing affordability for Bumiputera youths.

LITERATURE REVIEW

Providing an affordable house to all members of a society involves many factors, including social, economic, political, psychological, and health aspects. However, ensuring ownership for every person through housing affordability is one of the most complicated challenges in most countries. Previous studies by Quigley and Raphael (2004) found that certain selected cities in the United States of America, New Zealand, the United Kingdom, Australia, the Republic of Ireland and Canada, have an increasingly low housing affordability index. While in Malaysia, the government has established numerous initiatives to introduce affordable housing for low and middle-income households over the years. Uniquely in Malaysia and many other East Asian countries, homeownership is a critical part of government strategies to eradicate poverty and redistribute income, especially among low-income people (Syafiee Shuid, 2008) is manifested in the numerous Malaysia Plans. Table 1 summarizes government efforts towards delivering and promoting affordable housing from the first Malaysian plan till the 12th Malaysia plan.

Table 1. Government Strategies on Affordable Housing in Malaysia Planning

Malaysia Plan	Key Highlight on Government Strategies
1 st Malaysia Plan (1966-1970)	<ul style="list-style-type: none"> • Relieve congestion and combat the squatter problem through government as key player focuses on low cost and public housing. • Control of urban land values and physical planning for the proper land use in urban areas through the private sector focus on medium and high-cost housing.
2 nd Malaysia Plan (1971-1975)	<ul style="list-style-type: none"> • Encourage national unity in housing development.

- 3rd Malaysia Plan (1976-1980)

 - The private sector was responsible for building a large portion of the housing for people, including low cost.
 - Eradicate poverty and restructuring society to prioritize housing for the low-income group through appropriate housing programs and incentives for homeownership and provision of essential services and facilities within the neighbourhood.
 - Improve rural living conditions through various public and private housing development schemes.
 - Housing investment for middle- and high-income groups will continue to be primarily met by private developers.
 - 4th Malaysia Plan (1981-1985)

 - Promote accessibility for adequate housing to all Malaysian, especially lower-income groups.
 - Active involvement of the private sector in the provision of low-cost housing.
 - Implement low-cost housing schemes based on the condominium concept to optimize land use and enhance the quality of life.
 - The ceiling price for a low-cost house was set.
 - 5th Malaysia Plan (1986-1990)

 - Implement the Human Settlement Concept in housing development by promoting adequate social facilities, infrastructure, and public amenities for public unity.
 - 6th Malaysia Plan (1991-1995)

 - Home owning within various income groups is emphasized.
 - The government created new laws and guidelines to control the private sector.
 - Malaysian privatization and incorporated concepts in housing construction such as low cost.
 - 7th Malaysia Plan (1996-2000)

 - Establishing *Syarikat Perumahan Negara Malaysia Berhad* (SPNB) in 1997 and introducing a new pricing scheme.
 - Ministry of Housing and Local Government had set the house price categories. It can be divided into low-cost housing (below RM 42, 000), low medium-cost housing (RM 42, 001 – RM 60, 000), medium-cost housing (RM 60, 001 – RM 100, 000), and high-cost housing (more than RM 100, 001).
 - Low-medium cost house is introduced.
 - 8th Malaysia Plan (2001-2005)

 - Establishing *Syarikat Perumahan Negara Malaysia Berhad* (SPNB) in 1997 and introducing a new pricing scheme.
 - Ministry of Housing and Local Government had set the house price categories. It can be divided into low-cost housing (below RM 42, 000), low medium-cost housing (RM 42, 001 – RM 60, 000), medium-cost housing (RM 60, 001 – RM 100, 000), and high-cost housing (more than RM 100, 001).
 - 9th Malaysia Plan (2006-2010)

 - Accelerate the implementation of low-cost housing program through enforcement on *Program Perumahan Rakyat*.
 - Encourage homeownership by expanding the hire-purchase scheme.
-

10 th Malaysia Plan (2011-2015)	<ul style="list-style-type: none"> • Identification of the applicant to own or rent the low-cost homes is upgraded through database integration of registration and distribution at the Federal level and state. • Encourage the use of Industrialized Building Systems (IBS) in home construction which is affordable. • Introducing 102,200 units of affordable housing for low-income households through <i>Program Bantuan Rumah</i> (PBR), <i>Program Perumahan Rakyat</i> (PPR), and <i>Rumah Mesra Rakyat Malaysia</i> (RMR1M), as well as housing for the second-generation settlers of Federal Land Development Authority (FELDA) and FELCRA Berhad (FELCRA). • Affordable housing for M40 households was provided through <i>Perumahan Rakyat Malaysia</i> (PR1MA), <i>1Malaysia Civil Servants Housing</i> (PPA1M), and <i>Rumah Wilayah Persekutuan</i> (RUMAWIP). • Introduce the new financing schemes, namely My First Home Scheme, Youth Housing Scheme, and Affordable Private Ownership Housing Scheme (MyHome), to financially support first-time home buyers.
11 th Malaysia Plan (2016-2020)	<ul style="list-style-type: none"> • Introduce another 653,000 affordable housing units for B40 and M40 households in Malaysia, with an average of 130,000 units constructed per year. • Continue to enhance promoting housing ownership among the hardcore poor and the low- and middle-income households.
12 th Malaysia Plan (2021-2025)	<ul style="list-style-type: none"> • Currently, the 12th Malaysia Plan (2021-2025) has not officially launched and is provided in the portal of the Economic Planning Unit. However, for ensuring that the country's growth remains sustainable in line with fair, equitable, and inclusive economic distribution, the housing planning will be in line with the Vision of Shared Prosperity 2030.

It is apparent from the table that shows the government's effort to increase the opportunities for all residents of various income levels to obtain adequate, quality, and affordable housing. Thus, priority is continued to be given to developing low- and low- medium-cost houses. However, the 'affordable housing' term is highlighted more during the 10th Malaysia Plan, ranging from RM42,000-RM400,000. Unfortunately, the pricing and restriction for people to own affordable housing are unbalanced, and most of the price lies within the unaffordable range. As the proves, only 35% of Malaysian households can afford housings that exceed RM 250,000 between 2016 and the first quartile of 2017. While in terms of the new housing launches, only 24% were within the affordable range (Construction Industry Development Board Malaysia (CIDB), 2019). Najihah and Ahmad (2021) claimed some affordable housing schemed, such as

PRIMA, have shown evidence of discrimination which has a price range of RM 400,000.00 and below.

In comparison, other studies show that housing affordability improved from 1995 until 2009 but started to decline between 2012 and 2014 (Jason, 2017). Adding to that, a survey by Bank Negara Malaysia in its Quarterly Bulletin Report also stated that houses in Malaysia remain severely unaffordable by international standards, with a median multiple 2 of 5.0 in 2016 (Cheah, S.L et al., 2017). In fact, in 2019, recent reports stated that the average house price of RM417,262 was still unaffordable for most Malaysians since the maximum affordable house price was RM282,000 (News Straits Times, 2019).

While many policies have been devised and implemented to allow most citizens to afford to own houses, homeownership among those in the middle-income youth generation, especially Bumiputera youths, has not been given enough attention. On the other hand, out of 4,990,482 people living in urban areas in Selangor, 2,527,503 were Bumiputera, contributing 51% of the total population living in this urban area. Among these, 1,398,331 or 55% of the total Bumiputera population were in the youth Bumiputera generation. Thus, it can be concluded that the youth category forms the largest group and influences vital sectors of the national economy, especially the property sector. However, according to Ismail et al. (2015), the income of the Bumiputera is the lowest compared with the other races. Therefore, in determining the current housing affordability scenario, several factors have been identified from the literature. Table 2 below shows the factors categorised into two types, monetary and non-monetary, and all the items applied to measure the independent variables.

Table 2: Factors of Housing Affordability

Types	Factor	Reference
Monetary Factor	Household Income	O'Dell, Smith & White, 2004; Ismail et al., 2015; Khazanah Research Institute, 2015, Chowdhury, 2013; Bujang et al., 2010
	Housing Price	Hasmah, 2008; Mallach, 2009; Property Market Report, 2019; DOSM, 2010
	Loan Approval	Ismail et al., 2014; Bujang, 2016; Noel Achariam, 2017
	Household Expenditure	Khazanah Research Institute, 2015; Mattingley & Morrissey, 2014;
	Type of Financing Scheme	A. Ismail et al., 2015; Rosylin et al., 2018
Non- monetary Factor	Type of property	Esther, 2006; Hanif & Singaravello, 2007; Suhaida et al., 2010; Norazmawati & Rahim, 2012
	Number of working households	Wong, Hui & Ko, 2010; DOSM, 2020

Location	Aminah Md. Yusof and Azimah Razali, 2004; Mohd Razali Agus, 2000; Kamal et al., 2016; Mohd Delam, 2017; Azreen et al., 2018
Type of occupation	Zafirah, 2014; Kamal et al., 2016;
Education level	Bujang, Zarin & Jumadi, 2010; Suhaida et al., 2010; Wong et al., 2010; Norazmawati & Rahim, 2012; Atfield, 2013
Age and health status	Wong, Hui & Ko, 2010; Rowley and Ong 2012;

METHODOLOGY

This study is based on the quantitative method and uses the purposive stratified sampling approach. The respondents were selected based on several criteria: Bumiputera youths aged between 20 and 40 years old, staying in Klang, working, and intending to buy a property. Klang was selected as the study area since it has many new housing schemes and has a large Bumiputera youth population of 335,553 people, as reported in the Malaysian Population and Housing Census (2010). The questionnaires were distributed online (using Google forms) between 1 March 2020 and 30 May 2020. Before the official distribution of the questionnaires, a pilot test was conducted with ten respondents. The subject analysis of 382 has been determined according to sampling statistics from Collis and Hussey (2009) that state the number would be sufficient to describe the characteristics of the wider population. The total number of responses was 113, equivalent to 30% of the population sample (n=382). The response rate was still acceptable since 30% was a reasonable response rate to a questionnaire survey conducted as part of a social science survey using email and mail (Sekaran, 2003). Descriptive analysis was used to describe the profiles of the respondents and the factors that influenced housing affordability among Bumiputera youths. All the data were analysed using the Statistical Package for Social Sciences (SPSS) version 23. The results were then analysed by comparing the mean average score for each variable. The factor with the highest mean was interpreted as the main factor influencing the affordability of homeownership among Bumiputera youths.

FINDINGS AND DISCUSSION

This section addresses the analysis of the survey outcomes and summarises the key findings based on the monetary factors, and non-monetary factors.

Monetary Factors that Influence Housing Affordability

From the findings, as shown in Table 3, four monetary factors strongly influence housing affordability among Bumiputera youths, with a high mean score of more than 4.0. Those factors comprise income household (4.48), housing price (4.43),

loan approval (4.35) and household expenditure (4.14). Meanwhile, the type of financing scheme contributed a mean score of 3.98.

Table 3: Monetary factors that influence Bumiputera’s youths housing affordability

Factors	Mean	Standard Deviation
Household income	4.48	0.553
House price	4.43	0.565
Loan approval	4.35	0.623
Household expenditure	4.14	0.666
Type of financing scheme	3.98	0.681

Source: Questionnaire survey, 2020

The present survey indicated that, out of five factors, the four most significant monetary factors influencing housing affordability among Bumiputera youths were household income, housing price, housing loan approval, and household expenditure. Twenty years ago, researchers such as Abd Rahim Abd Rashid (2000) concluded that the unfair distribution of the Bumiputera lot quota in the market exacerbated the problem by causing house prices to exceed affordable levels based on income. In contrast, based on data released in the Household Income and Basic Amenities Survey (HIS) report by the Department of Statistics Malaysia (2020), this started to change positively when Bumiputera households made up 53.5% of the 1.72 million households in Malaysia with a monthly gross income of at least RM10,000 in 2019. However, with the country's rapid development and economic challenges, Bumiputera's income levels were, on average, significantly lower than those of other ethnic groups; therefore, the vast economic gap between ethnicities remains one of the nation's biggest challenges.

In terms of housing prices, the significant years of 2012-2014 have become the benchmark to show the gap between house prices, which rose by 26.5%, double the rate of the increase in household income (12.4%). The trend remained the same until at least 2017, when house prices increased by 9.8% compared to household income, which only increased by 8.3%, according to Bank Negara Malaysia (Malaysian House Price Index, 2018). Thus, due to the slow rise in household income, which is not synchronized with house prices, Bumiputera youths cannot afford to buy a house. House prices are influenced by acquired land cost, interest rate, inflation, material costs, demand, and supply. Many housing developers in Klang, especially in the urban area, are less interested in building medium- and low-cost housing because the profit margin is lower than high-cost housing. Therefore, this puts pressure on the youth generation, especially the Bumiputera, who comprise a significant proportion of the middle- and low-income groups.

The third monetary factor that influences housing affordability among Bumiputera youths is loan approval. Unfortunately, those in the younger generation often fail to acquire loans because of their income and high debt commitments due to their lifestyle, turning the group into a generation of renters. Moreover, the purchasing power of most Malaysians generally remains low because of the rising cost of living. Besides, most financial institutions decline housing loan applications made by youths, especially fresh graduates and newcomers, to employment, as the amount they apply for tends to exceed the 30% rule of thumb (i.e., loan payments should be 30 percent of gross household income). However, many developers have started offering various rebates to increase the buyer's purchasing power, especially with 10% down payments off rebates. In addition, the government is also continuing to offer stamp duty exemption under the Home Ownership Campaign (HOC) to encourage an increase in homeownership among Malaysians. However, the purchasing power remains low due to the significant financial impacts of the COVID-19 pandemic and the subsequent Movement Control Order (MCO). As a result, the property market's performance recorded a sharp decline in the first half of 2020 (H1 2020) compared to the previous year's (H1 2019).

Household expenditure is the fourth monetary factor that influences housing affordability among Bumiputera youths. The present study shows that respondents predominantly allocate between RM1000-RM2000 per month for housing expenditure. Besides, the monthly expenses of the respondents depend on the loan repayment, individual debt payments, and house rent. However, it might be challenging for the Bumiputera youths to minimise their expenses during the COVID-19 pandemic due to the impact of implementing the Movement Control Order (MCO) on their savings and sources of finance. For example, during the MCO, there has been an increase in the frequency of food purchasing trips to ensure their food supplies are adequate, increasing the overall cost of housing expenditure. Furthermore, the impact of COVID-19 might exacerbate the housing affordability situation as many youths have experienced the loss of a percentage of their original salary and a subsequent loss of income.

Non- monetary Factors

Based on Table 4, the results show that three non-monetary factors strongly influence housing affordability among Bumiputera youths in Klang. Those factors with a mean score of more than 4.0 are: type of property (4.19), number of households (4.07) and location (4.06). In comparison, the other three non-monetary factors are more moderate and comprise the type of occupation (3.92), an education level (3.68) and age and health status (3.67).

Table 4: Non-monetary factors that influence Bumiputera’s youths housing affordability.

Factors	Mean	Standard Deviation
Type of property	4.19	0.766
Number of working households	4.07	0.728
Location	4.06	0.859
Type of occupation	3.92	0.908
Education level	3.68	1.136
Age and health status	3.67	1.056

Source: Questionnaire survey, 2020

The results indicate that three out of the six non-monetary factors significantly influence Bumiputera youth housing affordability: type of property, number of working households, and location. In terms of Klang's existing housing stock, there have been an increase in all types of houses, particularly stratified properties, compared to landed properties. National Property Information Centre (NAPIC) (2016) stated that condominiums and apartments represent the highest proportion of the existing and incoming housing supply in Selangor. However, only youths between the ages of 30 to 39 can afford a house since they are not eligible for low-cost houses due to the restriction and being trapped in a middle-income situation. In other words, the middle-income trap does not qualify for low-cost housing but cannot afford even the medium cost of units in residential projects. Besides, low-cost housing and flats are considered less attractive as a youth housing choice, so youth between 20 and 29 encounters more critical housing affordability problems. In other cases, developers are less interested in building affordable houses because the profits and margins are small compared to other property schemes. Thus, the Bumiputera, who are most likely to be immigrants to the state, have found that houses offered in urban areas are beyond their financial capacity, based on their income.

In terms of the number of working households, households with lower incomes must supplement their income with additional loans and debts to survive and meet their various financial commitments. Thus, if more people in a household are working, the burden is reduced, and they have a greater capacity to survive the higher cost of living. This contributes to the challenges Bumiputera youths face to afford a house. Sometimes, low median and average income growth give rise to income trap circumstances, especially for working households with residents educated at diploma level and above, rather than STPM- and SPM-educated households. This situation is common in middle-income countries where income does not increase to the higher income segment. Thus, the number of working households is significant, as the size of the household plays a vital role in residual income.

The third non-monetary factor that influences housing affordability is the location of the property. The choice of location is significant because people

tend to opt to stay in a place that enables household expenditure to be minimised. Housing and transportation are the two most significant expenses for most households and often collectively account for more than one-half of all household spending. However, sometimes the locations of the housing areas and the Bumiputera lots are not strategic. For example, if the location is in an urban area, most Bumiputera could not afford a house there. This reflects the fact that house prices in the city centre are high. For that reason, people prefer to stay near the city rather than the city centre because most can only afford to buy or rent a house in the former location. Unfortunately, if the transportation costs rise, this may influence other external costs, especially housing expenditure. The final option is to buy a house in a rural area, which the potential buyers do not favour. Besides, the mismatch between locations and where different races live would make it almost impossible to implement a strict 30% Bumiputera quota. For instance, a 30% Bumiputera quota would not be enough for most Bumiputera areas such as Shah Alam, Selangor, compared to Cheras in Kuala Lumpur, where most residents are Chinese.

CONCLUSION

In conclusion, several factors have been identified as significant and challenging in Bumiputera youth homeownership. Based on the study, seven factors influencing housing affordability among Bumiputera youths in the Klang district involved monetary and non-monetary elements. The former factor includes household income, housing price, loan approval, and household expenditure. Meanwhile, the non-monetary factors are the type of property, number of working households, and location. In this study, the findings also indicate that the gap and determinant of housing affordability among Bumiputera youths are strongly related to monetary and non-monetary factors. Even though the government has implemented numerous housing schemes to assist the youth generation in purchasing and owning a house, housing affordability problems among the youth generation, especially middle-income Bumiputera, have yet to be successfully addressed. Thus, the authors recommend that the state government of Selangor identify affordable housing price ranges that are based on locality and household income levels. With the present study's contribution, it is hoped that a solution to the housing affordability problem could be found to support the government target as outlined in the Eleventh Malaysia Plan, which is to ensure that at least 75% of Bumiputera households can own a residential unit.

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THE MATRIX OF LAND TENURE PROPERTY RIGHT FOR WATER SETTLEMENT AREA

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Abstract

The Land Tenure Property Right (LTPR) concept is critical for establishing ownership and rights to land or property. Land is inextricably linked to a community's social identities, and it is critical for them to understand their rights. Water settlement areas are not included in the formal LTPR, which results in ambiguous rights, informal land tenure, and ambiguity regarding certain LTPR elements. As a result, this article will discuss the difficulties associated with LTPR in this area. The article employs a qualitative approach, with data collected via face-to-face interviews and analysed using thematic analysis. Three case studies are included, in which all of the villages are located in a water settlement area. Six challenges are identified in the context of LTPR that require revision and strengthening. By combining the general LTPR framework and the results, a Matrix of LTPR that meets the criteria in the water settlement area is produced.

Keywords: land tenure, property right, water settlement area, qualitative study

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INTRODUCTION

Land tenure and property rights refer to the interests that individuals, communities, families, businesses, and other corporate or community structures have in land, water, forestry, wildlife, and, in some cases, mineral resources. According to a 2013 report by USAID, private ownership, leasehold, and various types of corporate rights, such as community, group, and shareholder, are all examples of property rights and tenure arrangements. Systematic property rights include mechanisms for resolving disputes, defending rights, and administering or managing land-based resources.

There is mounting evidence that tenure and property rights issues can contribute significantly to political instability, population displacement, food insecurity, and environmental degradation, undermining or preventing the successful implementation of development programs (Courtney et. al., 2017). The issue of land tenure and property rights encompasses both terrestrial and subterranean land, as well as marine space. In Sarawak, there are a few traditional fisherman villages located on the water (water village) where small-scale fisheries provide the primary source of income. The community's pattern of life in the water settlement area is similar to most other Malay communities. They want to live in close proximity to one another; also, a parcel of land with numerous dwellings is occupied by family members such as siblings or relatives (Samsudin & Abidin, 2016). Frequently, those who live in water settlement areas are vulnerable because their land tenure is not legally recognised; additionally, they face threats posed by climate change. Vulnerability is the impediment to attaining sustainable development (Ismail et. al., 2019).

Proper land tenure and property rights will result in best land use practices (Samsudin, 2020). The best land use practices can help protect or improve the state of the environment, or vice versa. Simultaneously, ambiguous land policies, insecurity of tenure, lack of clear rights, and lack of coordination regarding land use will have an effect on the environment and natural resources (FAO, 2002). As a result, it is a major concern; if formal land tenure is absent in the area, the issue of land title insecurity may arise.

Thus, this article discusses the Land Tenure Property Right (LTPR) concept, the LTPR issue, and how the concept aids in defining the LTPR for water settlement areas.

LAND TENURE AND PROPERTY RIGHT

Land tenure, land value, land use, and land development are the four primary functions of the modern land administration system. The four functions are interdependent and cannot exist independently. Each of these functions complements the other in the land administration organisation. According to Williamson et al. (2010), land value is influenced by the economic and physical use of land. Additionally, land zoning and planning guidelines and regulations

have an effect on the land's value. Meanwhile, land use planning and policies determine the concept of future land development.

The National Land Code (Act 828), the Sarawak Land Code (Cap 81), and the Sabah Land Ordinance (Cap 68) govern the land administration system in Malaysia.

Land Tenure

Land tenure can be defined as an institution in which rules and guidelines are established to regulate how public land is used. The rules governing access to grant permission or rights to use, control, and transfer land titles include the associated responsibilities and restrictions. In simple terms, the land tenure system aids in determining who is eligible to utilise a land resource based on the time and condition of the resource (FAO, 2002). According to the United Nations Economic Commission for Europe (2005), land tenure is 'the mode of acquiring land rights. Land tenure is defined as the nature and manner in which rights and interests can be created, transferred, and retained through the various types of land (AUC, ECA, & AfDB., 2010).

Land tenure is determined by four distinct processes: statutory, customary, religious, and informal. All four of these factors will influence land use, development type, and other land transactions (Payne et al., 2015). Additionally, within the same country, various types of land tenure exist. It varies according to the type of development and the policies that support it. For example, statutory law is more commonly associated with urban areas, whereas customary law is prevalent in rural areas. This circumstance has exacerbated conflicts over land administration and development objectives.

Property Right

Denise (2007) concurs that the modern legal concept of property ownership is referred to as a bundle of rights. Essentially, the term 'bundle' derives from the root word 'bind' or 'binding'. The term 'bundle' refers to the collection of items that were previously separate and existed independently (Fischel, 2009). In practice, multiple individuals or groups may hold various rights, such as the right to sell the land, the right to use the land, or the right of way across the land. For example, the bundle of rights, or as some refer to it, the sticks in the bundle, may be shared between a landowner and a tenant in order to form a leasing agreement. Each party retains all rights resulting from the agreement (FAO, 2002).

Property rights can be defined as a collection of rights to use, control, and transfer assets, including land. Property rights are social conventions that reflect people's agreement on how to hold, use, and exchange these assets. These include the rights to occupy, enjoy, and use land; to exclude others from entering or using land; to dispose, buy, or inherit land; to develop or improve land; to

cultivate land; to sublet land; to realise financial benefits; and to access land-related services (USAID, 2013).

The Concept of Land Tenure Property Right (LTPR)

USAID published a Land Tenure Property Right framework in 2013 that addressed four areas: knowledge management, training and capacity development, LTPR issues and situation assessment, and LTPR intervention and impact assessment. This framework is intended to aid in the comprehension of LTPR. The framework is depicted in Figure 1.

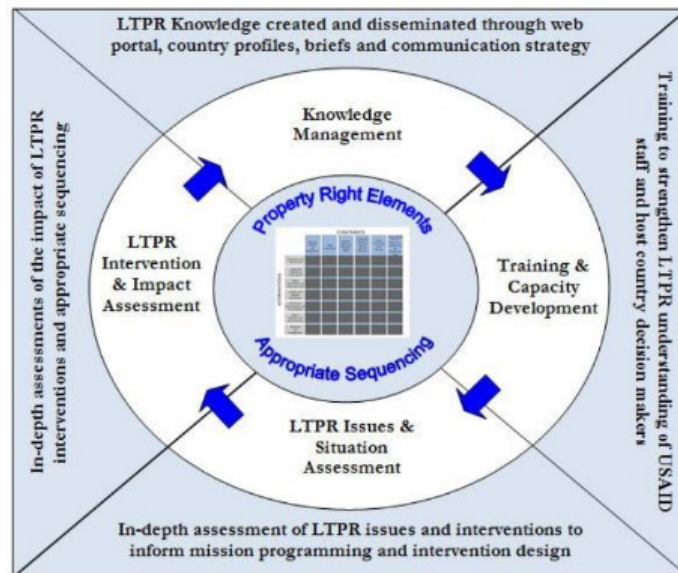


Figure 1: The Framework of Land Tenure Property Right
Source: USAID, 2013

Six constraints and common sub issues were discussed throughout the framework as in Table 1:

Table 1: Common Sub Issues for LTPR

Issues	Description
Resource conflict and displacement	It encompasses conflict over land and resource inequity, tenure insecurity as a result of competition, and land grabbing.
Weak Governance	It entails a lack of transparency, as well as a variety of statutory, customary, and informal tenure systems.
Insecure tenure and property rights	Tenure and property rights insecurity encompasses land disputes, informal settlements, a lack of infrastructure development, and insecure tenure for vulnerable groups.
Inequitable access to land and natural resources	This constraint applies to landlessness, displacement, natural disasters, and informal urban settlements.
Poorly performing land markets	This includes inaccuracies/absence of market data and the growth of unplanned development.
Unsustainable natural resource management and biodiversity loss	It encompasses insecurity, ill-defined, and insufficient land rights.

Sources: USAID (2013)

METHODOLOGY

This article employs a qualitative research methodology. Furthermore, this study highlighted the findings based on information gathered from community leaders (head of village) only. Thus, three community leaders were interviewed face to face in three different case studies. Thematic analysis was used to analyse these data. This research will focus on three villages: Kampung Seberang Kedai and Kampung Limpaku Pinang in Limbang, and Kampung Awat-awat in Lawas. These villages were chosen because they are located in a water settlement area in Sarawak, thus meeting the study's criteria. The elements of land tenure property rights for water settlement areas were derived in the form of a matrix for LTPR based on the results of the interview with the respondent. The acronyms for each of the three villages mentioned in this article are listed in Table 2.

Table 2: Acronyms for Respondents

Acronym
Kampung Limpaku Pinang, Limbang, Sarawak R1
Kampung Seberang Kedai, Limbang, Sarawak R2
Kampung Bangsal, Awat-Awat, Lawas Sarawak R3

THE CHALLENGES OF LTPR FOR WATER SETTLEMENT AREA

Six (6) challenges of LTPR in the water settlement area have been identified through thematic analyses. While these three case studies are geographically distinct, their issues and challenges regarding land tenure and property rights are similar. The results are summarised in Figure 2.

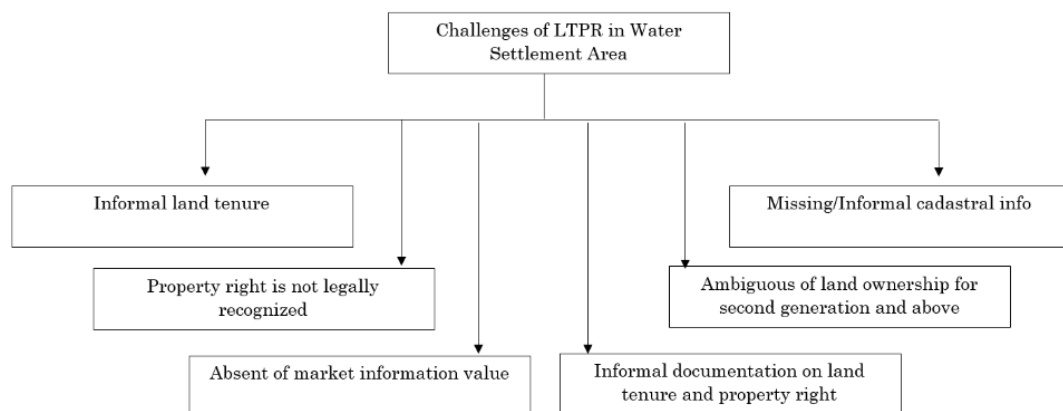


Figure 2: Challenges of LTPR in Water Settlement Area

Challenge 1: Informal Land Tenure

Land tenure in the case studies is based on informal systems of tenure. According to R1 and R3, these villages have informal land titles and possess the area on a 'first come, first served' basis. In contrast to R2, the village has two distinct titles: formal and informal. Typically, the first generation receives the formal title, but not the second. In this village, informal land tenure contributes to tenure insecurity, particularly for those classified as vulnerable.

Challenge 2: Property Right Not Legally Recognised

Without informal land tenure, property rights are also not legally recognised by the system. Even though it is not present, R1, R2, and R3 agree that they receive assistance from the government during disasters or difficult times, particularly when it comes to repairing their property. For example, in R1 village, residents have received assistance in the last few years to repair their house roofs due to its poor condition. It was the same in R3 villages during the 2013 and 2014 fires. According to him, the incident completely destroyed nearly 30 homes. With the assistance of the state government, the victims were relocated to a more secure location.

Challenge 3: Absent of Market Information Value

The absence of market information presents another difficulty in managing the LTPR for the water settlement area. R1 concurred that in the absence of market value, property transactions in the village are conducted through mutual agreement between trusted parties. This is also true in R2's village. R1 and R2 agree that there are no disagreements regarding property transactions at the moment. However, a development plan will be implemented in the area in the future to boost the tourism and economic sectors. Without a doubt, when projects come in, investors follow. Thus, it is critical to safeguard what they have now in order to avoid future conflict. Additionally, Manaf et al. (2010) research indicates that the absence of sale and purchase agreements on the island will influence the land development process in the near future.

Challenge 4: Informal Documentation on Land Tenure and Property Right

R1, R2, and R3 all agree that they used a similar approach to determine possession in the village. The approach of informal documentation to document the LTPR of houses in villages. The village head recorded the property's details, including the number of households, its location, size, and other characteristics. These documents have been entrusted to the district office's safekeeping. Without proper documentation, a dispute will inevitably arise during a future property transaction.

Challenge 5: Ambiguous of Land Ownership for Second Generation and Above

Due to the absence of formal land tenure, the second and subsequent generations are also impacted. According to R2, a new area will be established near their village in order to relocate the villagers. However, it drew criticism from villagers, particularly the first generation. Additionally, R1 stated that the village committee has requested from the state that a new space adjacent to the village be opened and reserved for second generation residents to ensure their residential area is secure.

Challenge 6: Missing/Informal Cadastral Info

The final obstacle is that LTPR in the water settlement area is concerned with their cadastral information. According to R3, he used a drone to map the village and forward it to the Land Office. Even though the village lacks formal cadastral information, this effort is part of legalising the village's boundary for land tenure and property rights.

THE MATRIX OF LAND TENURE PROPERTY RIGHT FOR WATER SETTLEMENT AREA

Even though the challenge and issues are not critical at the moment, they will be critical in the long run. With Sarawak's rapid planning and development, these water villages have been incorporated into the plan. Thus, based on the study's suitability, the Matrix of Land Tenure Property Rights (LTPR) for water settlement area is derived by combining the results of thematic analyses and the USAID LTPR framework. This matrix is critical because it serves as a tool for defining and recognising the LTPR for the area of water settlement.

The challenges/restraints in LTPR are linked to the interventions in this matrix using categories. Constraints or challenges in the LTPR for water settlement areas can be classified into four categories, as illustrated in Table 3. As illustrated in Figure 3, these themes will aid in the development of the matrix, as will the interventions for each challenge.

Table 3: Categorisation of LTPR Challenges in Water Settlement Areas

Constraints/Challenges			
Resource Conflict	Insecure Land Tenure and Property Right	Access to Land	Poor Performing Land Markets
i. Informal Land Tenure	i. Informal Land Tenure	i. Ambiguous of Land Ownership for Second Generation and Above	i. Absent of Market Information Value
ii. Property Right Not Legally Recognised	ii. Property Right Not Legally Recognised		ii. Informal Documentation on Land Tenure and Property Right
iii. Informal Documentation on Land Tenure and Property Right	iii. Informal Documentation on Land Tenure and Property Right		iii. Missing/Informal Cadastral Info
iv. Ambiguous of Land Ownership for Second Generation and Above	iv. Missing/Informal Cadastral Info		

		Constraints/Challenges			
		Resource Conflict	Insecure Land Tenure and Property Right	Access to Land and Natural Resources	Poor Performing Land Markets
LTPR Interventions	Awareness and Empowerment				
	Conflict and dispute resolution				
	Legal and Regulatory Framework				
	Land Administration and Governance				

Figure 3: The Matrix of Land Tenure Property Right for Water Settlement Area

According to Figure 3, challenges are addressed through four levels of intervention: community awareness and empowerment, conflict and dispute resolution, legal and regulatory framework, and land administration and governance. With this matrix, it is hoped that the LTPR for water settlement areas can be recognised.

CONCLUSION

As a result of this article, one can conclude that land tenure and property rights in the water settlement area are informal and should be formalised. Ambiguity regarding land ownership, property rights, and documentation in this area will not result in a system of good governance and land administration. Even though land disputes or conflicts are not critical, it is past time for the LTPR system to be revised to facilitate future development. LTPR must be legally recognised in order to bolster statutory rights and raise community awareness about the critical nature of having clear and transparent LTPR. In order to do so, the development of matrix of land tenure property right is essential in recognizing the LTPR for water settlement area.

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ACQUIRING ELEMENTS OF SOLAR FARM DEVELOPMENT'S APPROVAL CONSIDERATION IN JOHOR

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Abstract

In order to fulfil the increasing energy demand, Malaysia aims to reduce carbon emission by 45 percent by 2030, and becomes fully carbon neutral by 2050. However, promoting this energy has inevitably forced this new industry to face some drawbacks particularly related to land matters, especially solar farm development, which is still new in the country and does not have any proper guidance. As the control of land planning and development is under the responsibility of the State Authority as enshrined in Article 74 of the Federal Constitution, the implementation is different in each state due to different land policy known as the State Land Rules. Thus, selected respondents have been interviewed, and the findings have been acquired regarding the elements of solar farm development's approval consideration from the perspectives of land administrator, planner, and developer. This leads to a direction to standardize a legal framework of the land approval consideration for solar farm development especially in Johor.

Keywords: solar farming, land development approval, land use management, renewable energy

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INTRODUCTION

Solar farm does not have any specific definition, but it fundamentally generates electricity from solar radiation, and it is operating in a piece of land (Jones, 2014). Moreover, solar farm also predictably generates at least 5 Megawatt (MW) which is equivalent to the demand of 1,200 houses and requires at least 15 hectares of land; 30% of which is filled with about 20 thousand solar panels. Solar energy generation capabilities may vary according to locations due to the different capacities of solar radiation reception.

According to Sustainable Energy Development Authority (SEDA) (2017), solar radiation produces approximately $1,266 \text{ W/m}^2$ to the earth's atmosphere depending on the latitude, seasonality, and weather. Figure 1 shows the photovoltaic power potential in Malaysia, and this strategic position causes Malaysia to receive longer rays of sun radiation for around twelve hours, which produce solar energy through photovoltaic technology (Department of Meteorology, 2020; Manickam, 2017). There are several methods for generating solar energy around the world, i.e., ground- and roof-mounted, building integration or Building Integrated Photovoltaic (BIPV), and floating solar farm. SEDA has promoted solar energy through a variation of schemes and policies, but as for now, only New Net Metering (NEM), New Enhanced Dispatch Arrangement (NEDA), and Large-Scale Solar (LSS) are maintained (Cheah, 2021).

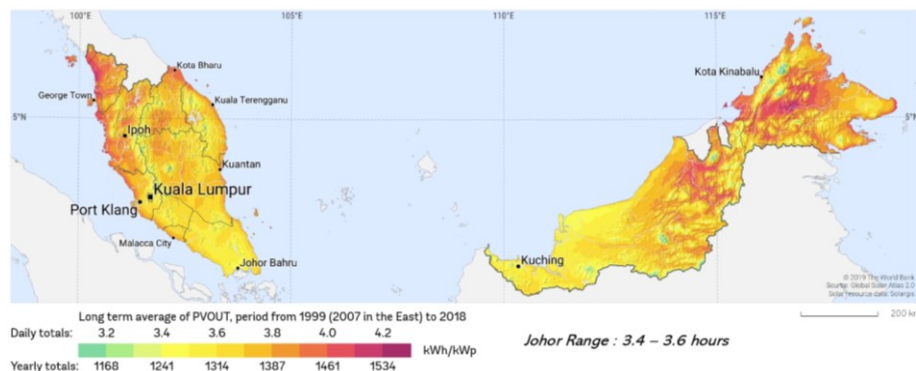


Figure 1: Photovoltaic Power Potential in Malaysia

Source: Solargis, 2019

In order to promote the use of this potential energy in Malaysia, the allocation of land is needed to develop a solar farm. According to Hernandez (2015), solar energy generation requires a suitable site to reduce the economic and ecosystem impacts of the land. As the operation is temporarily permitted within 20 years (SEDA, 2017), it raises confusion among land administrators,

developers, and landowners when the generation of solar energy is categorised as industrial development (TNB, 2019), which is they were built on agricultural lands, and it is contradict with provision of Section 52 National Land Code 1965. Thus, this study determines how the land administrator or State Authority approves the development of precise elements for approval consideration.

From the previous studies, many elements and criteria were found and most of them came from planners' perspective, such as site selection and the potential of solar energy. Site selection for a solar power plant is a complex process because of the different safety, economic, environmental, and social needs that must be considered (Yun-na et al., 2013). Furthermore, the location with the best source of sunlight cannot always be selected because there are several other factors that play important roles in the selection of a suitable location specifically economic, environmental, and social factors (Van Harren et al., 2011). These include effects on land, landscape, and visual facilities; ecology and nature conservation; cultural heritage and historical environment; construction and highway traffic; safety; economic benefits; and potential economic and social impacts to the community. Although many local planning authorities clearly support the development of solar energy, but the full emphasis and use of decision-making models in giving full consideration to such issues are required (Tanavana et al., 2017).

Thus, Sindhu (2017) has grouped those elements into five main elements as a decision compiler known as political or legal, technical, environmental, social, and economy. Thus, this study was focused on political or legal' elements, specifically from the perspectives of land administrators, planners, and developers. These is including state government policies, regulatory bodies, land acquisition, and resettlement and rehabilitation. In terms of land administrators' or planners' consideration, the political factors include land category, development zoning, land conditions (express and implied conditions), methods of approval, and any other requirements for solar farm development's approval consideration. As the solar farm development is still new in the country, the land administrator does not have any proper guidelines especially in considering approval for the development. This leads to the findings of the study that is acquiring the elements of solar farm development approval consideration.

RESEARCH BACKGROUND

Issues And Challenges from Current Practices

Based on current practices in Malaysia, there are several methods of approval by the State Authority in developing solar farms. As the development of solar farm is temporary, the decision to use Special Permit is seen appropriate to support in promoting the solar development. However, it remains controversial among legal

practitioners as some states direct developers to change the terms of the agricultural land.

The provisions of Section 52 of the National Land Code 1965 only state the types of land use in three categories, namely agriculture, building, and industry in the land title document and must be complied by landowners unless allowed by the State Authority through a change of land. According to the Sustainable Development Authority (SEDA) (2017), solar power generation operations are allowed in the short term of only within 20 years. Tenaga Nasional Berhad (2019) states that solar energy generation is similar to electric power plants and is categorized as industrial development. Thus, it triggers confusion among land administrators, landowners, and developers. However, if the land used is rented or leased for a period of time, then the original landowners do not have the intention to revoke the applications because the original agreement with the developers only allow them to use the land for solar development.

In addition, there is no clear legal provision for the development of these solar farms, thus causing some issues to arise. First, some landowners take the opportunity to develop solar farms on agricultural lands without changing express conditions of the lands which ultimately cause financial implications to the State Authority due to land tax collection differences where agricultural land tax is cheaper than industrial land tax. Moreover, the development of solar farms requires large areas that require the cooperation of several landowners (Sabo et al., 2017; Hui et al., 2009). No clear legal provision also makes landowners less confident to give up their lands to carry out solar farm development activities (Fthenakis & Kim, 2009). Thus, land administrators need to be equipped with comprehensive and clear procedures and policies to support the development of solar farms that have great potentials in the future.

Land Development Process and Procedure

The development control in Peninsular Malaysia is implemented through two levels, namely the state level and the local level. At the state level in Peninsular Malaysia, the State Government is fully responsible for all matters including land use, land conversion, amalgamation, subdivision, and other matters related to land in respective states. At the local government level, the local authority is responsible for controlling the development in the planning area from technical aspects such as layout, building design, route system, and provision of public facilities.

Part of the planning function involves control over various development activities carried out by the public and institutions to create a healthy, safe, and harmonious environment. The activities carried out should be in line with the structural plan policies and local plan proposals. In terms of development, the principle practiced by the government is that no individual has an absolute right to his land instead of an exclusive right to a property. The absolute right to land

exists only on the part of the government when necessary to safeguard the public interest. This right is evident under the Town and Country Planning Act 1976 (Act 172) which prohibits a person from carrying out development activities or activities without permission from the local planning authorities unless existing activities have already existed before this act came into force

In carrying out development control, the provisions in the National Land Code Act 1965 (Act 56) and the Town and Country Planning Act 1976 (Act 172) are the basis for administration, control, and reference to land development practiced in the country (Yahya, 2010). Pursuant to Act 172, 'development' is defined as carrying out any building, engineering, mining, industrial, or any other similar work on, above, next to, or below ground, making a change in the use of a land or any – any part thereof or subdivide boundaries or annex the land. Apart from that, the Roads, Drains and Buildings Act 1974, the Environmental Quality Act 1974, and other related acts also refer to land development practices by relevant authorities.

Generally, the process of land development in Malaysia involves three main stages of planning or pre-construction, construction, and post-construction (Abdullah et al., 2011). The planning or pre-development stage involves the process of obtaining Planning Permission (PP) which is submitted to the One Stop Service Centre (OSC) subject to Subsection 19 (1) of Act 172, which is to obtain Planning Permission (PP) from the Local Authority (LA) before starting a development. Planning permission refers to permission granted, with or without conditions, to carry out development. This means that any development as stated in the development proposal (Section 21A) and layout plan (Section 21B) must submit a planning permission application to LA for approval. Planning permission approval is a mandatory statutory approval for applicants to commence development work. Therefore, any development carried out other than what is approved by LA pursuant to Section 20 or contrary to the stipulations stated in the District Local Plan is not allowed in accordance with the provisions of Section 18 (1) of Act 172.

Then, OSC will distribute the submitted PP applications to the technical departments for comments for the purpose of approval consideration. Usually, the approval is given by planning approving committee among the local authorities where the OSC is located. According to Manual of OSC 3.0 Plus (2019), there are twenty-two (22) representatives from technical departments and local authority's councillors who are the decision makers at the OSC, but it is depends on the development application. For example, in Johor, there are 10 technical departments involved in providing reviews. These include four internal departments from the Local Authority – Planning Department, Building Department, Engineering Department and Health Department, District Land Office, Irrigation and Drainage Department, Fire and Rescue Department, Public Works Department, Telekom Malaysia Berhad, and Tenaga Nasional Berhad

(Suhailizan, 2019). This review will assist the OSC in setting the conditions for the purpose of approval. If the application is approved, then PP will be issued through the C1 Form. The C1 Form will be used as the basis and main reference for land related applications such as boundary breaking and changes in express conditions for the consideration and approval of the State Authority. Fundamentally, the land development application procedure engages five main stages that applicants must go through, as Table 1 follows:

Table 1: Main Stages for Land Development in Malaysia

Stage	Description	Legal Revision
1	Application for Development Policy Approval or land conversion approval	Section 124 of the National Land Code
2	Application for planning permission	Section 21 (1) of Act 172
3	Application for boundary subdivision/ amalgamation/ subdivision	Section 136 of the National Land Code
4	Application for building plan approval	Section 70 of Act 133
5	Application for approval of Certificate of Fitness for Occupation	By-Law 27, Uniform Building By-Laws 1984).

According to solar farm development, it also must go through the same process which involves physical changes to land for construction activities, as well as a substantial change (permanent) involving land use changes through the application of changing the land use category. A solar farm can be defined as a temporary land for activities with a maximum period up to 25 years.

CASE STUDY

This research concentrates on the elements of approval consideration of solar farm development including reviews from a planner and a developer. A case study has been selected which involves ZEC Solar Sdn Bhd, as it is the earliest solar farm application through Johor Land and Mines Office. It is located in Kota Tinggi District in Johor with estimated area of 140 acres, a Malay Reserve Land, with a combination of two plots of agricultural land, specifically palm oil plantation, that are about 20 to 30 years old in a clean, well-managed, and perfect condition. The soil conditions are steep, low, and hilly, and the soil type is of the yellow clay type. The north of the land is for electrical transmission, while in the south is for road reserve, east is for pipeline storage, and west is planted with palm oil. This development is estimated to produce 29 Megawatts (MW) and the area includes solar panels, solar equipment, control room, office, and other relevant related utilities. The layout of the power plant is shown in Figure 2.



Figure 2: The Layout of YPJ Solar Farm Power Plant

METHODOLOGY

This study was conducted using open interviews with selected respondents, and they were selected using purposive sampling according to the research needs and purposes. In addition, the four respondents were selected since they were involved directly in the approval of this first solar farm in the state and telecommunication tower developments. Then, the data were analysed using content analysis based on data obtained interviewed with those respondents.

Table 2: List of Respondents in the study

Respondents	Job Position	Agency
R1	Chief Assistant Director of Disposal, Enforcement & Technical Division	Johor Land and Mines Office
R2	Land Administrator	Kota Tinggi Land and District Office
R3	Planner	Kota Tinggi District Council
R4	Developer	ZEC Solar Sdn Bhd

RESEARCH FINDINGS

Based on data obtained from the interviews, all respondents have responded on their scopes respectively. As mentioned above, this study focused on the elements of solar farm development's approval consideration. Based on the interviews, a Kota Tinggi District Council (MDKT) representative (R3) has responded as follows.

R3: “...application of Planning Permit was submitted to Kota Tinggi District Council (MDKT) and reviews from related technical department have been made. We do not have any issue due to the application. For example, Department of Engineering MDKT put some conditions towards the applications, that are the applicants need to submit building plans, earthwork plans, roads and drainage, as well as street lighting plans. In addition, all forms of temporary construction work on the site must obtain MDKT approval and all permits must be clarified in accordance of Planning Permission that has been given...”

Next, the development needs permission from land administrators. As this solar farm development has no specific guidelines in the state, permission has been done through the District Land Office and Johor Land and Mines Office.

R1: “...as the case study area is over than 10 acres, the approval might be considered by Johor Land and Mines Office as stated in National Land Code 1965 and Circular No. 2/1985. For now, we are using the telecommunication tower application as a benchmark of the elements of approval consideration in solar farm development. There are two reasons why it became the benchmark for the development. First, the telecommunication tower and solar farm are a temporary development. Second, both are built in agricultural land without land conversion. Due to this fact, we are using Special Permit to approve the development through two laws that are Section 115 (4) (f) (g) National Land Code and Johor Land and Mines Office Circular Number 3/2006.”

Figure 3 illustrates the shared elements between telecommunication tower’s and solar farm development’s approval consideration.

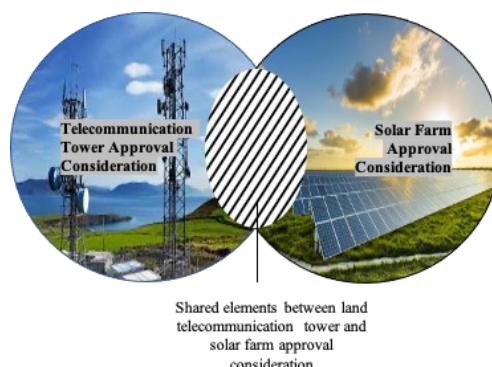


Figure 3: Shared elements between telecommunication tower and solar farm approval consideration.

R2: *“the elements of approval consideration are same as other development, but since it is a new development in the state, it needs some references especially from other states. We considered elements are who are the applicants whether they are landowners or developers, site area including the surroundings, land category, restriction, and conditions including zoning and title, technical reviews due to the application, and fee rate of the development. In addition, the application's approval consideration can be easier if the applicants have the certificate from Energy Commission (ST) and Planning Approval from local authority...”*

According to the case study, the developer and landowner are different entities. But the landowner has leased the land to the developer for 25 years for the purpose of solar farm development.

R1: *“we have given Special Permit to the landowner as provided in Section 115 (4) (f) (g) National Land Code 1965 that give flexibility to State Authority to allow the use of agricultural land for non-agricultural purposes other than agriculture to be included in the State Land Rules. This method is also stated in Rule 38 D of the Johor Land Rules and is read together with Circular Number 1/2006 Director of Johor Land and Mines Office... this Special Permit will be expired by 31 December and must be renewed every year for maximum period for 25 years. However, the permit may be revoked immediately without any compensation if the licensee violates any provision subject to the district land administrator.”*

The issuance of Special Permit on the agricultural land is in Johor, with Circular No. 3/2006 listing down only two types of use. First, the management of matter relating to the telecommunication tower or structure. Second, the management of matters relating to the use of agricultural land for non-agricultural purposes. The first purpose involves government land, agricultural land, and building structure, while the second purpose involves private agricultural land. In connection with that, the R4 has identified an issue due to rate of fee for solar farm development.

R4: *“...according to the issuance of the Special Permit, the rate of fee for telecommunication tower is RM 80 per 100 meter square feet... It was inappropriate. Moreover, we need to make payment for the Special Permit including trust fees every year not including other*

maintenance cost... It raised some issues that the fees are just suitable for a small development like telecommunication tower instead of solar farm development that requires a large area... we are bound with bank agreement for 15 years and the lease with landowner for 25 years, so the estimated profit margin is small. Due to that, we have submitted an appeal to the Johor Land and Mines Office to review the rate of payment of this special permit as it affects the cash flow of developers, especially this development is still in its early stages and we still need time to get a return on investment that has been issued..."

Based on the findings above, the elements of solar farm development approval consideration have been made based on benchmark study that is telecommunication tower development. The land administrator considered of land ownership, the applicant, land category, land restriction and conditions including zoning of the land. Hence, the planner considered about technical reviews and the developer considered of special permit rate of the development. However, the Special Permit rate that offered by the land administrator arise profit margin issue to the developer. The fee seems unfitting with this kind of development because it covered a large amount of area compared to telecommunication tower that use just a small area. Thus, the land administrator has been combined those perspective to make the best decision towards solar farm development in terms of approval consideration.

CONCLUSION

In brief, the great potential for solar farm development as alternative energy resources in the country must be highlighted by the government. Due to this kind of development is still new in the country especially in Johor, the land administrator must be equipped with comprehensive and relevant land policy and procedures. The elements of approval consideration have been made based on the similar practise as benchmark that is development of telecommunication tower. Besides that, thoughts from other related parties including planners, developers, and landowners must be a concern by land administrators to promote the best decision especially in considering approval of solar farm development.

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RE-APPRAISING LAND DEVELOPMENT APPROVAL PROCEDURE THROUGH SURRENDER AND RE-ALIENATION MECHANISM IN JOHOR

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Abstract

The surrender and re-alienation or ‘serah balik kurnia semula’ (SBKS) mechanism in Johor has remained essentially significant for the state authority income. On account of the delay issues that impacted processing agencies and related stakeholders particularly state authority, the purpose of this article is to study the process and procedure conducted by Pejabat Tanah Johor Bahru (PTJB) in processing SBKS applications through (i) Identifying issues and challenges of existing processes and procedures that prevent the application of approval to be done in a timely manner; and (ii) To propose recommendation towards simplification and time-saving approval processes and procedures of surrender and re-alienation applications. From the analysis, there were 11 delay issues found to complete the 20 steps of the process. Thus, recommendations of approval were suggested by approval agencies and related stakeholders conducted in several series of Focus Group Discussion (FGD) as efforts to mitigate the delay issues faced by both sectors and hence accelerate the development process and generate state authority income effectively.

Keywords: land development process, surrender and re-alienation, land development mechanism, delay, state authority income

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INTRODUCTION

Land is the main source of income for the State Government which has an important role in the state economy (UNECE, 1996; Bell, 2006; Yeap, 2018). Averagely, more than 20% or more of the Gross Domestic Product (GDP) of any country is contributed by the land-related activity particularly in real estate and construction industries (UNECE, 1996). In Selangor, land revenue contributed approximately 70% (RM1.73 billion) of the state income in 2016. Meanwhile, 48% of the state income in Penang, Pahang, and Kedah derives from businesses and activities related to land. Land premiums, quit rent, and land transfer fees made up about 60% of the state income for Malacca in 2016. Similarly, 60% of the overall Johor State Government income comes from land revenue. 40% of the revenue generated by land grant premium, surrender and re-alienation (SBKS) premium, land registration fee, and other related services fee are major contributors. In addition, royalties from timber, forestry, and other mineral extractions will assist in increasing the state income, if included (Yeap, 2018).

From the percentage, land is a basic commodity for most economies. Therefore the allocation, use and management of land is vital to country and society (Subedi, 2016). An effective development process and procedure is crucial to ensure that they are always relevant to the current demands and at par with the requirement of all stakeholders involved.

RESEARCH BACKGROUND

Surrender and re-alienation or 'serah balik bermilik semula' (SBBS) is a mechanism to hasten the land development procedure as recognised under National Land Code 1965 under Section 204A to Section 204H of NLC 1965 (Awang, 1991). It involves a process of modification or variation of conditions, restrictions, and categories of land through Section 124 of NLC 1965 that can be done simultaneously with subdivision (Section 135 to Section 139) or amalgamation (Section 146 to Section 150). For developers, the mechanism is significantly advantageous for accelerating land development processes, and prevents the wastage of time to apply those processes separately (Seow, 2019).

However, this procedure involves various agencies and professionals i.e., registered surveyors, planners, the State Authority, the Land and Mine Office, the Land District Office, the Valuation and Property Services Department, the State Secretary Office (Housing Unit), the One Stop Centre (OSC) of Local Authority, and developers. The involvement of these agencies and professionals have given impact on the time taken to process the applications, which is too long and against the objective of the mechanism in expediting the development procedure in a timely manner (Abu Bakar Ibrahim, 2008; Amirul Haffiz *et al.*, 2019).

The implication of the delay in processing the applications has affected the income generation for the State Government due to the failure to collect first year tax payments, registration fees, and premiums for that particular year (Amirul Haffiz *et al.*, 2019; Suhailizan, 2020). In addition, it will increase the development cost for the developer due to the delay in the development schedule (Marzukhi, Omar and Leh, 2012; Ibrahim and Norris Kweku, 2018). It will also raise negative perceptions among the public regarding the efficiency and effectiveness of the Land District Office's service delivery. In the end, the developments planned in the form of residential, industrial, or commercial infrastructure fail to benefit society as a whole.

The purpose of this article is to study the processes and procedures conducted by the Pejabat Tanah Johor Bahru (PTDJB) in processing surrender and re-alienation applications through:

- (i) Identifying issues and challenges of existing processes and procedures that prevent applications of approval to be done in a timely manner; and
- (ii) To propose recommendations towards simplification and time-saving approval processes and procedures of surrender and re-alienation applications.

The outcome of this study is expected to solve the issue of delay in the process of surrender and re-alienation approvals in Johor, as well as minimise the implications of the delay to the stakeholders, particularly the State Government, developers, and society as a whole.

LITERATURE REVIEW

Definition and Practice of Surrender and Re-Alienation Mechanism

From the perspective of land administration, surrender and re-alienation or 'serah balik berimilik semula' (SBBS) is one of the land development mechanisms as recognised under National Land Code. 'Land development' generally refers to the change of original use of any alienated land that affects its restriction of interest, express conditions, and category of land use as opposed to what has been earlier approved by the State Government upon alienation (Azmi *et al.*, 2019). Although 'land development' is nowhere mentioned under the main legislation that governs land throughout the states in Peninsular Malaysia, National Land Code 1965 (NLC 1965) under Division III-Part 7-Chapter 4-Part 9 states that 'land development' or 'land development application' is referred to as subdivision and land conversion (Section 124A), subdivision (Section 135), amalgamation (Section 146), and surrender and re-alienation (Section 203 and Section 204A-H). Meanwhile, Town and Country Planning Act 1976 (Act 172) has defined land development under Subsection 2(1) as 'carrying out of any building, engineering, mining, industrial or other similar operation in, on, over or under land, the making of any material change in the use of any land or building or any part thereof, or the subdivision or amalgamation of land'.

According to Section 204B under the NLC 1965, surrender and re-alienation is defined as ‘surrendering the whole or more adjoining land held under final or qualified titles or combination thereof, owned by the same landowner, provided that part of the land will be re-alienated by the State Authority to the landowner in the form of different parts or units’ (Awang, 1991; Jaiya, 2017; Seow, 2019). The purpose of surrendering the land is to allow the State Authority to convert the land category in accordance with the development proposal and aligned with the gazetted development plan (i.e. from agriculture to building or industry). Then, the land will be subdivided or amalgamated (depending on the development purpose) before the State Authority re-alienates the land to the landowner to allow the development to take place. This will shorten the process of variation of conditions, restrictions, and categories of land which can be executed simultaneously with the process of subdivision or amalgamation according to Section 204A to 204H of NLC 1965.

In Johor, surrender and re-alienation (SBKS) mechanism has been implemented since 1973 (Abu Bakar Ibrahim, 2008; Suhailizan, 2020). According to Amirul Haffiz et al. (2019), the uniqueness of the mechanism practiced in Johor can be distinguished through the use of provisions under Section 197 (with Section 200) and Section 76 of NLC 1965 compared to other states in Peninsular Malaysia that solely use Section 204D. The provision adopted by the Johor Land Administration allows landowners to submit their layout plan simultaneously with the application of amalgamation, subdivision, as well as variation of condition in a single application. The flexibility of the practice has led to the amendments of NLC 1965 in 2017 under the provision of Section 204B which translate some of the approaches adopted by the Johor Land Administration. On the other hand, surrender and re-alienation application can be submitted without having to wait for the final title, rather than using the existing qualified title. It also allows the applicant to choose for the period of lease hold whether to maintain the existing lease period, or to extend the term to 99 years subject to premium applied.

Process of Land Development Approval through Surrender and Re-Alienation Mechanism in Johor

All land development activity is subject to Section 19(1) Act 172 to acquire planning approval from the Local Planning Authority before commencing, undertaking, or carrying out any development work unless permission has been granted pursuant to Section 22 of Act 172 that allows him to carry out development in accordance with the development proposal (section 21A Act 172) and the approved layout plan (Section 21B Act 172) together with the conditions imposed therein. This includes the surrender and re-alienation mechanism that involves physical changes on land due to construction activities, as well as material changes in land use categories.

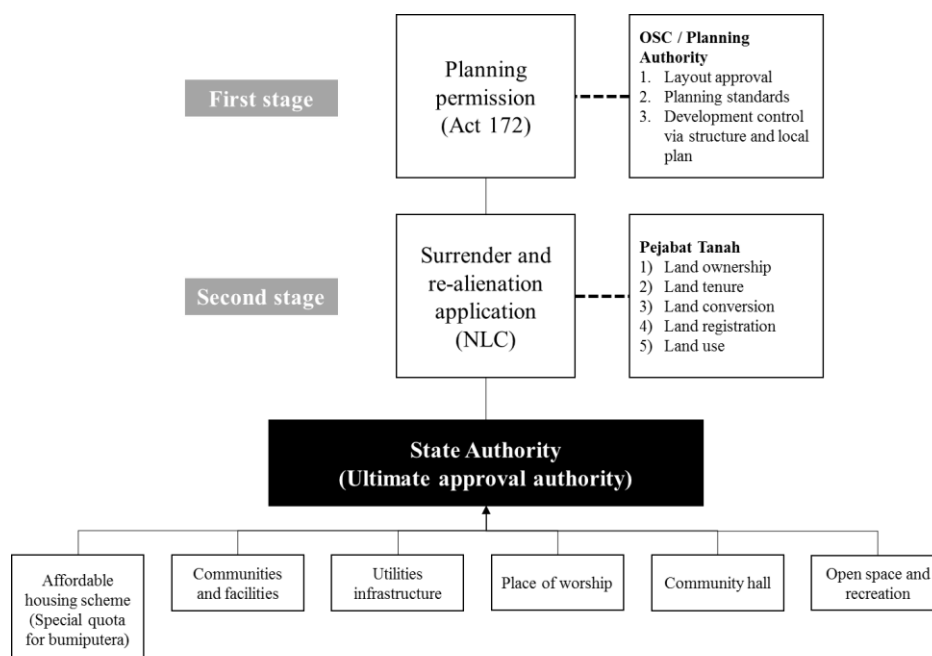


Figure 1: SBKS application process (Azmi *et al.*, 2019)

Azmi *et al.* (2019) have briefly describe the application process for SBKS implemented in Johor. From the figure above, the first stage of the application involved submission for planning permission to the One Stop Centre (OSC) centralized at the local planning authority. The OSC will then distribute the application to all the technical departments. Basically, there are about 10 to 15 technical departments which need to be consulted and to get their technical comments. They are four (4) departments from Local Authority (Planning Department, Building Department, Engineering Department and Health Department), including other external agencies namely Department of Irrigation and Drainage, Fire and Rescue Department, Malaysian Public Works Department, Telekom Malaysia Berhad, Department of Water Supply and Tenaga Nasional Berhad. In this regard, OSC shall stipulate conditions subject to the comments from these technical departments for approval. If the application approved, planning permission will be issued through Form C1. Once planning approval obtained, then it goes to the second stage of process consists of SBKS application at the Land Office. The whole process is expected to be completed within 107 days (Pejabat Tanah dan Galian Johor, 2021).

In this process, the basic understanding about the SBKS process is one piece of land is now intend to be subdivided to multiple pieces according to the proposed development which may comprise of residential, commercial and even

industrial. It may relate to components development that meet with the stipulated zoning, the preservation of green area, road reserve and few others. It means, once the planning permission is fully granted by the planning authority, any development shall proceed with subdividing the land under the SBKS process in which it requires for the consultation from the district land office before it is brought to the attention of the state authority. It is important to highlight that even if the planning permission has been granted at the local planning level according to provisions under Act 172, it does not mean that the development can simply take place without complying the SBKS requirements as highlighted by the Land Office according to provisions under NLC.

METHODOLOGY

This research is focusing on the approval process of SBKS mechanism in Johor. The benchmark of this process is derived from the process to obtain planning permission conducted by Planning Authority. The needs to enhance the effectiveness and efficiency of public service delivery in Malaysia has begun since 1980s. It involves programs to streamline the overall service delivery system, inject dynamism and efficiency in the provision of services as well as to ensure that the capacity and operation of the services provided are consistent and responsive to current conditions (Siddiquee, 2008). OSC was established in 2007 mainly to solve the issue of delay in approval process. With the establishment of OSC as the coordinator of development proposal applications at the local level, the engineering of old procedures has been improved so that the time norm of application processing can be shortened, simplify and streamline complicated and ineffective rules and abolish irrelevant procedures (Kementerian Perumahan dan Kerajaan Tempatan, 2019).

These improvements are in line with the requirements of the Sustainable Development Goals (Goal 16) to build effective, credible and integrity institutions at all levels as well as ensure responsive, inclusive, participatory and representative decision -making at all levels (Marzukhi *et al.*, 2019). At the national level, innovation and reform approaches in the planning service delivery system have been set out in 11th Malaysia Plan which devoted from the people and increased productivity and efficiency of public services through the following strategies.

- i. Strengthen and increase the accountability of local authorities;
- ii. Strengthen service delivery by local authorities through increased integration between the Federal and State Government;
- iii. Streamlining rules and processes to increase the speed of action by the local authorities;
- iv. Strengthen cooperation to stimulate local economic development;
- v. Intensify local community involvement and data sharing.

Based on the spirit of OSC establishment, the Johor Land Administration has taken the same initiative to re-engineer and refine land development processes and procedures to be simpler and times-saving so that the application can be approve in faster, efficient and accurate manner.

To conduct this research, Pejabat Tanah Johor Bahru (PTJB) was selected as a case study due to its high volume of land development applications and delay issues in application approvals. In the first phase, data were collected through first session of focus group discussion (FGD) among staff from PTJB who are directly involved in processing the applications for approval to identify related issues and challenges. Meanwhile, the second session of FGD was conducted to identify the issues and challenges faced by private sectors in submitting the applications to the PTDJB. Both FGDs were conducted in separate session, different date and location due to availability of place and date to discuss. The respondents involved private planners, licence surveyors, and land developers. This research uses purposive sampling to identify suitable respondents to participate in both FGDs as described in the table below.

Table 1: List of respondents involved in this study

Group/ Session	Agency	Job Position of the Respondent	Date and location	Quantity			
1/01	PTJB	3. District Land Administrator	11 April 2021 PTJB	1			
		4. Assistant District Land Administrator (Registration)		1			
		5. Assistant District Land Administrator (Development)		1			
		6. Assistant Land Officer		1			
		7. Draftsman		1			
		8. Chief clerk		1			
		9. Assistant clerk		1			
		1/02		Private sector	3. Licence surveyor	22 April 2021 UTMSpace	1
					4. Private planner		1
5. Developer	1						
6. Lawyer	1						
Total				4			
Total quantity of respondent participation in FGDs				11			

The results were analysed using descriptive analysis to describe the existing processes and procedures that are being practiced in PTJB. Subsequently, issues and challenges of the approval process faced by both sectors were identified along with the process description analysis. As a result, recommendation for improvement towards simplification and time-saving practice of SBKS approval in Johor was proposed to minimise the implications of the delay to the stakeholders.

RESEARCH FINDINGS AND DISCUSSIONS

Issues and challenges of existing SBKS process in Johor Bahru District Land Office

From the discussion with the respondents in Group 1 and Group 2, the issues and challenges of existing SBKS process were identified. First, the planning permission approval acquired from OSC Local Authority has no expiry date. Thus, it gives no sense of urgency to the landowner to continue his application of SBKS at the Land Office. After the application was submitted, only then these issues and challenges were identified.

Firstly, the delay issues could happen due to the late submission of a complete application with payment by the landowner to the Land Office. The late appointment of a licenced land surveyor (LS) by the landowner to manage the application on his behalf at the land office could interrupt the early stage of SBKS process. The second delay occurs due to the time taken to prepare a land report by the Assistant Land Officer. A repetition step of preparing a land report twice was identified. The District Land Administrator has given the comment earlier when the application is being considered by OSC for planning permission approval. However, Assistant Land Officer is required to prepare another land report according to the format for SBKS approval at the Land Office. In turn, the format contains irrelevant information. Thus, the format needs to be reviewed to identify what type of information should be included in preparing the EXCO paper.

Thirdly, the current format of EXCO paper has never been changed nor revised in 35 years, which has caused some of the information required to be unnecessary. As a matter of fact, today's development narratives have changed progressively, not to mention the development that has taken place in the city-class local authority administrative area, as seen in Johor Bahru. It turns out that some of the information included are unrelated. In addition, the delay was also attributed to the preparation of EXCO paper that must be generated manually and through the e-RMKJ system. Both documents need to be read together to align the information obtained. The problem occurs when both documents are received separately, at a different time and date, thus interrupts the open file process by the Development Division of Johor State Director of Land and Mines (PTG Johor).

The next delay issue was then identified when the EXCO paper brought for the approval of the *Jawatankuasa Hasil Bumi* (JKHB) chaired by Menteri Besar Johor is limited in number. In average, only 50 EXCO papers will be presented by PTG in the meeting that includes application of SBKS, land conversion, partition, subdivision, state land, temporary occupation licence (TOL), land reserves, and other related application that requires approval consideration by JKHB. The limitation has put some of the applications on hold and thus drags the time of approval.

The delay issues were also identified when LS takes too much time to prepare a pre-com plan certified by the Chief Assistant Director of Development Division. Preparation of Notice 5A by unskilled clerks may affect the time of approval due to the incorrect amount of premium and other related payment as referred to JPU 94 Johor Land Rules. In addition, time is dragged even longer when it involves a large-scale mix development project that encompasses various types and sizes of development.

The landowner is given 3 months to settle the payment of premium and other related fees for land registration. However, time will be affected when the landowner appeals for a time extension, and is then approved by the District Land Administrator. After the payment of Notice 5A is made, PTD number will be prepared to be given to LS to prepare draft of qualified title (QT). The main issue of delay in this process is to obtain Bumiputera lots distribution certified by the Johor State Secretary Office (Housing Division) that will definitely take some time to acquire. Finally, minor mistakes could happen during the land registration process, such as the wrong spelling of landowner's name which will also cause delay due to the correction that must be rectified according to Section 380 of National Land Code 1965.

Although Pejabat Tanah dan Galian Johor (2021) has stated that the time to complete the whole approval process of SBKS is estimated to be around 107 days, there were still cases facing delay in approval for more than 2 years or equivalent to 730 days. From the discussion, the Figure 2 below illustrates the location of delay found in Step 1, Step 2, Step 3, Step 4, Step 7, Step 11, Step 12, Step 15, Step 16, Step 19, and Step 20 of the SBKS process.

From the described and illustrated process and procedure of SBKS, it is found that there is no specific time frame imposed to guard each of the workflow to be completed in a timely manner. An open time frame that gives no time limit for each of the members to accomplish their task has given room for delay issues to occur. Meanwhile, the action taken by different members in the process has given PTJB no power to control the workflow, except the tasks being administered under the PTJB. Ellis and Keddara (2000) commented that the workflow process is essentially multi-faceted since it is dealing with various members that are usually beyond control. According to Chow (1999), although workflow processes are complex, keen observation and analysis are required to mitigate the issues that occur, and thus improve the process effectively from time to time. Thus, improvement for each task is proposed to mitigate the issues.

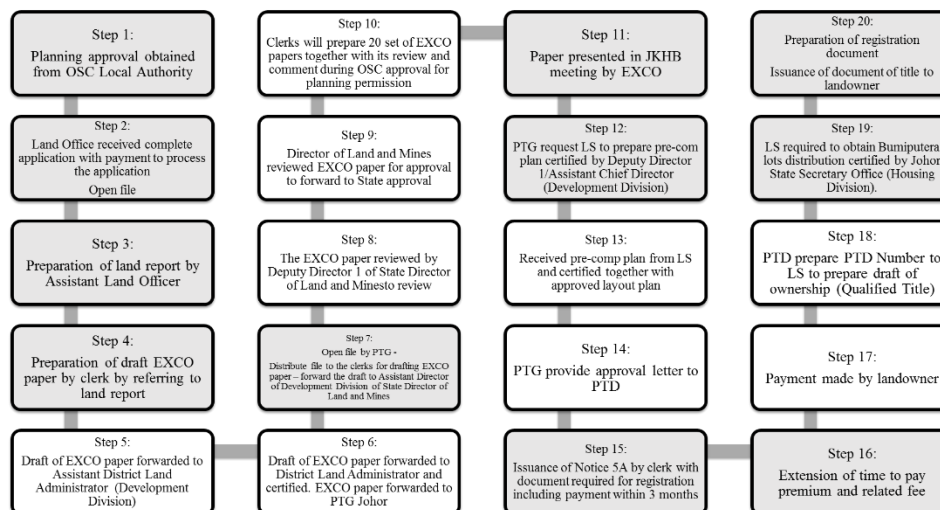


Figure 2: The location of delay in the SBKS process

Recommendation to improve the process of surrender and re-alienation mechanism in Johor

From the issues, the process of SBKS appear to be non-routine workflow that causes the time of approval to become uncertain. Thus, recommendation of improvement was suggested in the FGDs to smoothen the process and mitigate the delay issues faced by both sectors as detailed in the following table:

Table 2: The recommendation of improvement of SBKS process

Step	Issue	Recommendation of improvement
1	Planning permission approval has no expiry date	Application with complete documents and fee must be submitted to the Land Office within 2 months from the date of approval. Respondents agreed to suggest a charge for late submission as a penalty to create a sense of urgency to the applicant.
2-6	Delay in preparing the EXCO Paper by land office	<ul style="list-style-type: none"> i. Respondents suggest that second site visit is no longer conducted by the Settlement Officer (SO), thus the assistant clerk will proceed to prepare the draft of EXCO paper by referring to the land report prepared by the settlement officer during the process when the application is being considered by OSC at local authority for planning permission approval. ii. To provide the knowledge enrichment programme for the multi-level officers and the supporting staff to ensure the accuracy and efficiency in preparing the EXCO Paper. iii. The e-RMKJ system is an online system used in preparing the EXCO Paper for SBKS application. The improvement of the system is crucial to support and expedite SBKS process.

		<ul style="list-style-type: none"> iv. Irrelevance of EXCO paper format needs to be amended to include only relevant information to assist State Authority in making decisions. v. The draft of EXCO paper must be endorsed and forwarded by District Land Administrator to PTG within 10 days after receiving complete application.
7-11	Delay in preparing the EXCO Paper by State Director of Johor Land and Mines Office (PTG Johor)	<ul style="list-style-type: none"> i. The number of papers to be presented in JKHB meeting should not be limited to any certain numbers, but should be presented based on the actual number of EXCO papers that are being processed at that time. ii. The EXCO Papers must be presented to the JKHB within 30 days upon received the EXCO Paper prepared by LA. iii. For small-scale developments, delegation of power from State Authority to Director of Johor State Land and Mines Office is necessary to shorten and accelerate the approval process. iv. To mitigate issues in Step 12 as illustrated in Figure 2, the preparation of pre-com plan by LS must be completed at this stage to avoid delay just before the EXCO Paper presented to the JKHB.
12	Meeting Decision Notification Letter by Clerk of Johor Executive Council	<ul style="list-style-type: none"> i. The e-RMKJ system is an online system used in preparing the EXCO Paper for SBKS application. The improvement of the system is crucial to support and expedite SBKS process. ii. The enhanced e-RMKJ system must be include the online submission of the EXCO Paper to the Clerk of the State Executive Council's Office.
13-14	Meeting Decision Notification Letter by Johor State Land and Mines Office	The issue of delay in preparing pre-com plan by LS is mitigated in Step 7-11 when it is prepared just before the EXCO Paper presented to JKHB.
15	Notice 5A	<ul style="list-style-type: none"> i. Notice 5A fee should be generated through SHTJ 2.0 within 3 working days. This process will not require the assistant clerk to generate the amount of premium manually. ii. For any approval that subject to the imposition of 1% GDV, Notice 5A will be issued in advance (even if the estimated GDV has not been obtained), but the payment of Notice 5A must be accompanied with the payment of 1% GDV. iii. The estimated GDV must be included in the checklist of the documents to be attached during the submission to the Land Office.
16-17	Notice 5A payment	Payment fee of Notice 5A will be charged based on JPU if payment is made within 3 months. The extension of payment period is subject to a certain fee (rates still under review). If payment received later than the stated period, penalty is suggested to be imposed – RM1000/acre as per PTG Circular No. 1/1983 to a higher amount.

18	Issuance of PTD Number	PTD number will be issued within 1 to 3 days after receiving payment of Notice 5A depending on the number of new titles that will be registered.
20	Document preparation for registration and new title registered	<ul style="list-style-type: none"> i. Documents for title registration are submitted within 6 months after payment of Notice 5A is cleared. Delay in the registration process will be subject to a penalty payment calculated based on the first-year tax in Notice 5A and multiplied by the number of years of delay in registration. ii. The registration period is determined by the SSR evaluation criteria as follows: <ul style="list-style-type: none"> a) 1 to 50 titles - 5 days b) 50 to 100 titles - 14 days c) Over 100 titles - 30 days iii. It should be noted that the registration process affects the date of tax payment. For example, if the new title is registered after 1st October to 31st December 2021, then the annual tax will only take effect on 1.1.2023.

CONCLUSION

Surrender and re-alienation is a useful mechanism to assist developers in expediting the land development process. However, they were delay issues identified in the process that requires improvements to prevent developers, landowners, and other related stakeholders from suffering losses due to the late development application approval. From the discussion, it is found that the involvement of various agency and professional has led to the delay issues which taking longer time for approval. Although the delayed issues cause by the external factors and beyond Pejabat Tanah Johor Bahru's control, however measure were taken to minimize the issues through several recommendations that aims to simplify and hasten the process, as briefly elaborated in Table 2. However, the recommendations suggested require further investigation to examine its practicality and effectiveness to solve the delay issues in SBKS approval process and hence accelerate the development process and generate state authority income effectively.

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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.

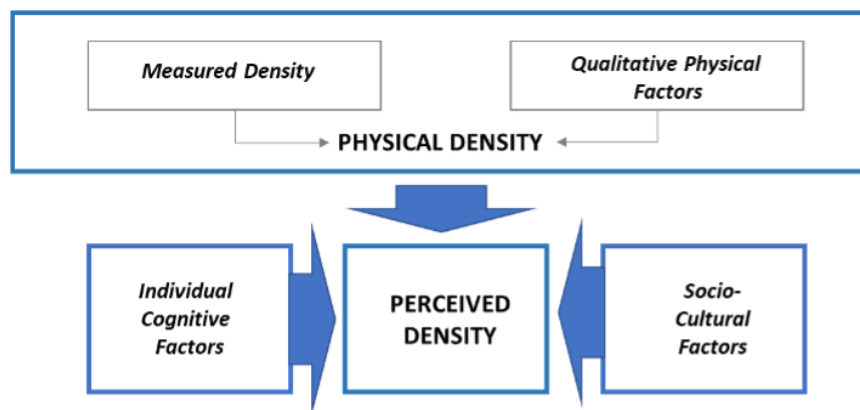


Figure 1: Perceived, Physical and Measured Density Concept
 Source: R. Alexander (1993)

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.

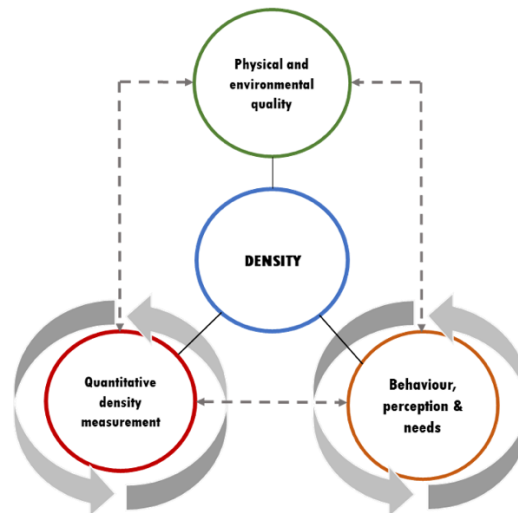


Figure 2: Density Conceptual
Source: Boyko and Cooper (2011)

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.

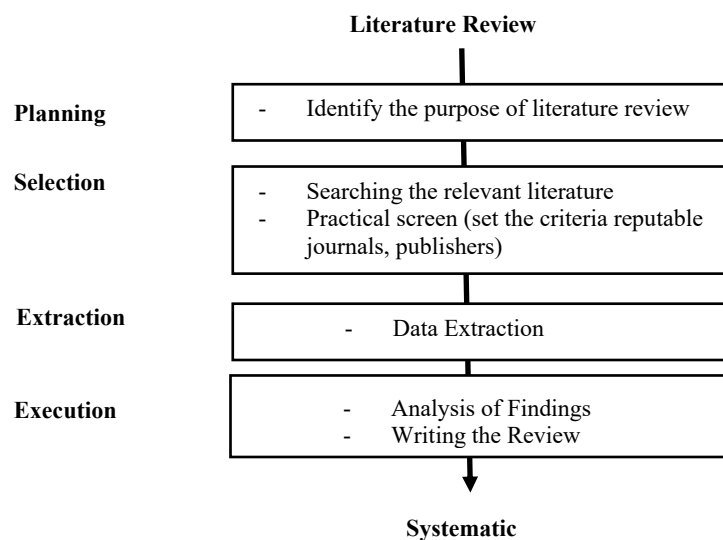


Figure 3: Systematic literature review methodology
Source: Adapted from Okoli, C & Schabram, K (2010)

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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ANALYSIS OF ELEMENTS INFLUENCING CHILD SAFETY IN HIGH-RISE BUILDINGS USING ANALYTICAL METHOD

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Abstract

Due to the lack of land in densely populated areas in Malaysia, high-rise residential building has become a trend in the recent years. However, in designing and constructing these buildings, safety considerations have not received adequate attention. This study aims to examine the causes of children falling from high-rise buildings, while the nature and frequencies of such accidents were also investigated. The paper is based on the existing literature, as well as feedbacks from questionnaires and interviews. The Analytic Hierarchy Process (AHP) approach within Multi-criteria Decision Analysis was adopted for the analysis undertaken in this study. The outcome reveals that accidents involving child falls can be prevented by establishing appropriate policies and regulations. The strict enforcement of safety laws and regulations will help to avoid untoward accidents and dispel negative thoughts about living in high-rise buildings. The findings elaborate on the ranking of elements that influence child safety in high-rise apartments.

Keywords: Child Safety Element, High-rise Buildings, Analytical Hierarchy Process

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INTRODUCTION

Contemporary building design must protect people and property. Designers should be motivated by the need to address not only threats such as criminals and terrorists, but also natural threats such as earthquakes, hurricanes, floods, and accidents, which could cause a building to collapse. Designing and building accommodation that incorporates enhanced security is a key aspect of the concepts, principles, and processes of new and existing buildings, particularly in multi-storey buildings. Security planners and designers must create ways to incorporate protective measures into multi-storey building designs to ensure the safety of children (Joseph et al., 2004).

Falls from heights are a major problem in urban areas, especially involving children living in multiple-storey and often deteriorating low-income housing (Sieben et al., 1971; Garrettson et al., 1985; Spiegel & Lindaman, 1997). A study done in the United States, falls have represented up to 20% of child deaths from unintentional injuries, compared to an average of 1% to 4% nationally (Waller, 1999). The majority of fall-related fatalities among children are associated with falls from heights, mostly from three-storey houses or higher. Falls from one or two storeys are more frequently nonfatal, but second-storey falls may cause serious injuries (Marilyn et al., 2001). Although the average age of patients injured in falls from heights is approximately five years, the age distribution is bimodal; preschool children are more likely to fall from windows than older children (Meller, 1987 & Bull et al., 2001).

ACCIDENTS INVOLVING CHILD FALLS: THE CASE OF HIGH-RISE DWELLINGS

Falls from high places in the home are the main cause of injury among children (Pressley and Barlow, 2005). Children may fall from windows and structures, corridors, balconies, stairs, playground equipment, and even bunk beds (National Action Plan for Child Injury Prevention, 2012). Besides causing the highest number of injuries among children, falls are sometimes fatal. It has been estimated that in the United States, three million children annually need emergency department care for various fall-related injuries (World Report on Child Injury Prevention, 2008). Of the many kinds of impact falling accidents, some may be simple traumatic experiences while others may result in very serious injuries or even death.

Studies have identified various factors related to a high incidence of falls. Research findings have shown that boys fall more frequently than girls; this can be 50 to 300% more, according to different reports. More than two-thirds of all falls happen to children below five years of age, with head injuries and fractures being the most common outcomes. This group of young children also recorded a higher mortality rate from falls (Sieben, Leavitt, & French, 1971).

Depending on the nature of the falls, injuries of varying severities can result. Among the most serious types of falls are the instances where children fall from

a great height, usually from the high-rise buildings where they live. Child falls from tall buildings commonly occur from windows, balconies, or verandas. Unsurprisingly, their injuries can be severe or even fatal. Such accidents are becoming more frequent, especially in urban areas where living in multi-storey apartments is becoming more widespread.

THE MAIN ELEMENT IN CAUSES OF CHILDREN'S FALLS

Although not all falls are fatal, children who fall from height may suffer a range of serious injuries, such as fractures, internal trauma, and brain injuries (Smith, 1975). This is because children tend to topple head first, using their arms and hands to break their fall. A study conducted in the United States showed that 15 out of 70 children who fell from a height of one or more storeys suffered minor soft tissue trauma. Fifty-four per cent suffered head trauma and 33% incurred skeletal trauma. It is highly likely that a child who suffers such an injury will need life-long medical care and assistance (Sherry, 2012, Sahril and Mutalip, 2014).

In Sydney, the Centre for Trauma Care, Prevention, Education and Research and the Kids Health Promotion Unit at the Children's Hospital in Westmead formed a working party in 2009 after the city experienced a dramatic increase in child falls between 1998 and 2006. On average, seven children a year suffered serious falls from windows. Balcony falls also experienced a rise, increasing from an average of six between 1998 and 2006 to 11 in 2007 (Sherry, 2012). Unfortunately, centralised hospital records on children's falls were not maintained, making it difficult to determine the exact number of children treated in various hospitals for injuries due to window and balcony falls in Sydney (Sherry, 2012). The same situation has been happened in Malaysia, especially in urban areas. However, accurate statistics cannot be identified because the incidence of children falling from multi-storey dwellings in Malaysia has been recorded in sudden death category. The issue does not entirely relate to the action taken by adult but also the building design.

It is vital that parents with young children living in high-rise buildings are educated on child safety. Hence, there is no substitute for vigilant adult supervision. Children may fall from windows, balconies, or verandas, which are the main areas of potential hazards. Injuries can be minimised or deaths avoided altogether through proactive measures (Miller, 2011).

Installing window guards is one of the most effective ways of preventing a potential fall, regardless of parenting skills, income, or education. After such a measure was made mandatory in New York, there was a 50% reduction in falls in the two-year period from 1973 to 1975 (Sherry, 2012). This shows that the mandatory provision of physical barriers is the most effective means of reducing the number of child fall injuries or even saving lives. Studies have shown that the risk of a child's injury associated with housing is independent of other risk factors (Shenassa, 2004). Hence, mandatory preventive measures that ensure children do

not fall from height would certainly reduce, if not eliminate, the possibility of fall-related injuries among children living in high-rise homes.

In Malaysia, the Uniform Building By-Laws (UBBL) 1984 enacted under the Street Drainage and Building Act 1974 stipulate that all new buildings require submission of plans for approvals prior to construction by a principal submitting person (PSP), such as a Professional Architect and Professional Engineer. The UBBL 1984 stipulates the building's structural requirements related to the design and specifications of materials, loadings, foundation and superstructure; which govern the design, specifications and construction of walls, floor and building structure. The UBBL 1984 also stipulated the construction requirements and fire requirements of a building. However, for multi-storey residential buildings, the standards set are comprehensive and more focused on design for safety in the event of fire.

While the standards and guideline issued by the Ministry of Housing and Local Government for window, balcony, corridor and stair design are comprehensive. The window height limit was in line with international standards. The heights above 1100mm for windows are a safe distance for children. However, the standards issued was only emphasize the height limit of window. The window opening limit itself is not set in the checklist provided. This window opening limit is important since active children will act to pick up objects as a tool to climb towards the window and can cause the child to fall. With a limit on window openings, this risk can be reduced. The standards for balcony were focused more to the disabled and the area of the horizontal space. No specific standard is described regarding the height of the balustrade for children. In addition, barrier type standards and barrier openings are also not specified for child safety.

METHODOLOGY

The Analytic Hierarchy Process (AHP) approach within Multicriteria Decision Analysis (MCDA) was adopted for the analyses undertaken in this study. MCDA is a form of data analysis used to identify related criteria based on previous research. Determining the principal criterion/element that explained the incidence of child falls from high-rise buildings was divided into two hierarchical levels, with the goal at the higher level, followed by the explanatory criteria (Figure 1). Those elements were based on extracting input derived from a systematic literature review. Each criterion (element) in the hierarchical level was compared pair-wise with another element to determine which was preferable in achieving the goal at the higher level. The selection of the goal and the criteria contributing to the goal were based on reports contained in the literature, feedback from questionnaires, as well as interviews with high-rise residents and experts in the field. This study involved 435 survey respondents and 7 experts involving Department of Director General of Lands & Mines, Department Of Town and Country Planning and Fire and Rescue Department to strengthen the results of the study.

MCDA is one of the most widely used decision-making methodologies in science and engineering research. In the field of engineering, MCDA has been applied to flexible manufacturing systems, layout design, and integrated manufacturing systems, as well as in evaluating technology investment options (Priyabrata et al., 2013). Essentially, MCDA facilitates a selection from the choices available by grouping possible alternatives to rank them and then determining how well the best choice meets the selection criteria. This approach helps researchers focus on what is important, logical and consistent (Ferreira et al., 2011).

One difficulty frequently encountered when employing MCDA is ranking various possible decision options (attributes, decision criteria, or objectives) that are characterised differently in relative or absolute importance but must be considered concurrently (Gbanie et al., 2013). To meet this challenge, MCDA divides the decision into smaller parts that are easier to understand. To that end, the AHP was applied to determine the relative importance of the factors at each hierarchical level that influenced the final selection of the principal factor. The AHP technique assigns weightage systematically to each element to determine its relative contribution to a decision (David et al., 2014). The subsequent integration of the parts produces the decision solution. Interested parties have the opportunity to evaluate the strengths and weaknesses of the alternative solutions available, as well as offer adjustments and trade-offs, before arriving at the final decision.

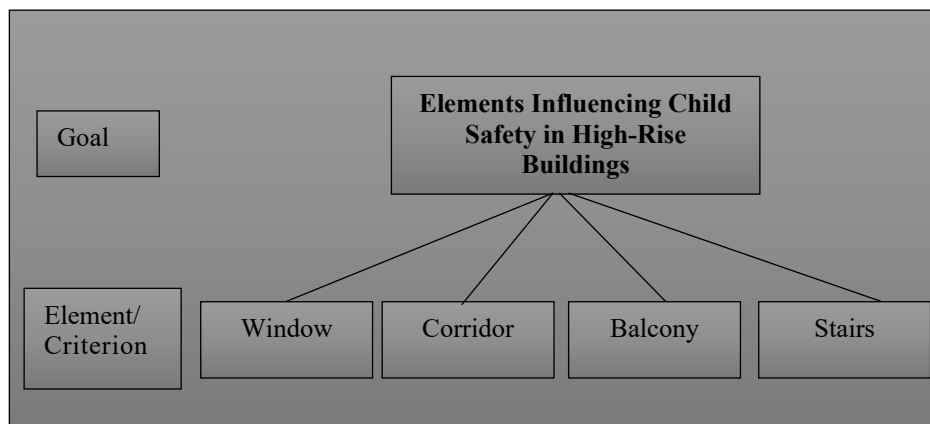


Figure 1: Hierarchical levels of relationships between the overall goal, the interests (Criteria) seen as important to the decision

ANALYSIS AND DISCUSSION

Since this study was conducted based on locally and internationally established literature, pair-wise comparisons were used to determine the weights applicable to the factors/criteria for the AHP. Each evaluation criterion or element was assigned a weight, with the criterion scoring the higher weight being deemed the

more important factor. Using the Microsoft Excel spreadsheet, an overall score was then assigned to each criterion based on the sum of the pair-wise comparison scores obtained. As the criteria selected for the MCDA were of unequal importance, the results of the weighted comparisons reflected the relative importance of each element and its contribution to the goal. The relative importance of the eight criteria that influenced the incidence of child falls from high-rise buildings is presented in the pair-wise comparison matrix in Table 1.

Table 1 : Pair-wise comparison matrix (PCM)

Corridor	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Window
Corridor	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Balcony
Corridor	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Stairs
Balcony	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Balcony
Balcony	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Stairs
Window	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Stairs

Table 2: Pair-wise Comparisons for Criteria

Pair-wise Comparisons for Criteria				
Criteria	Corridor	Balcony	Window	Stairs
Corridor	1	0.1667	0.3333	5
Balcony	6	1	2	8
Window	3	0.5	1	6
Stairs	0.25	0.125	0.1667	1

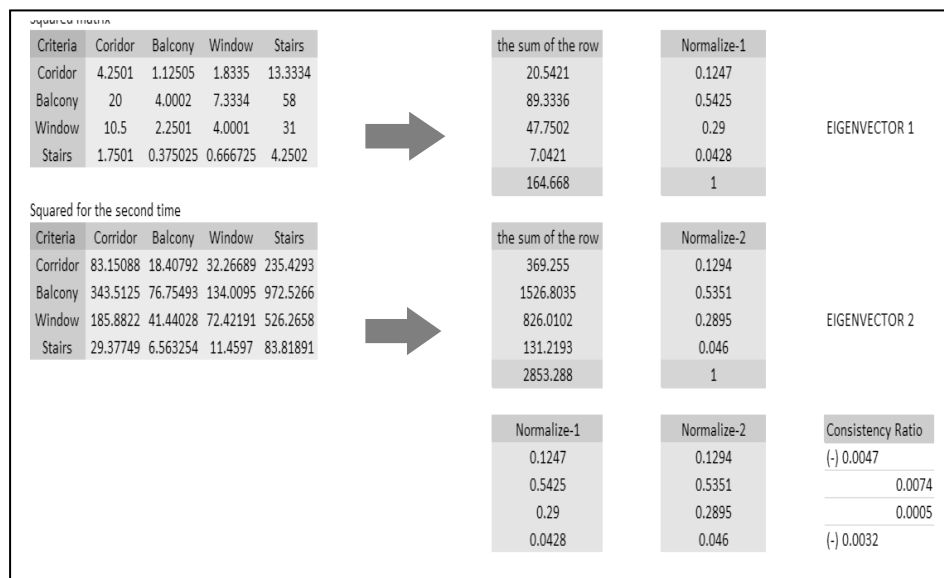


Figure 2: Computation of priority of criteria/elements using the AHP and MCDA

Four elements, *viz.* balcony, window, corridor, and stairs, were selected as the possible contributing factors to the occurrence of child falls from high-rise buildings. These elements were selected based on residents' responses in questionnaires, case studies, the literature, and interviews with experts. The pairwise comparison matrix (PCM) was used to determine the weightage for each element by row-column normalisation to obtain the eigenvectors, as shown in Figure 2. The ranking of the elements in Table 3 indicates that the presence of a balcony (eigenvector value = 0.5351) was the most important element in terms of explaining why children fall from tall buildings. This was followed by windows in high-rise apartments (eigenvector = 0.2895), and corridors (eigenvector = 0.1642). The fourth element, stairs, appeared to be of less importance (eigenvector = 0.046).

Table 3: Ranking of the selection criteria as determined by eigenvectors

Eigenvector	Ranking	Element
0.1294	3	corridor
0.5351	1	Balcony
0.2895	2	Window
0.046	4	Stair

The weightage assigned to each element/criterion was based on the records of cases of child falls from multi-storey buildings in Malaysia from 2000 to 2014. The victims fell most frequently from balconies compared to the other elements, *i.e.*, windows, corridors, or stairs (Table 4). From the cases examined in the present study, from the questionnaire responses, and in the opinions of experts, falls from a balcony were often linked to an apartment's furniture arrangement, in particular, the furniture location relative to the balcony. The balcony space and the view from it were also factors that influenced the behaviour of victims. Children are inclined to climb balconies to reach for objects, *e.g.*, to retrieve an object lying outside the balcony. In these circumstances, children might slip, lose their balance, and fall. Furniture and domestic appliances on the balcony, such as washing machines, are often used by children as climbing aids.

A spacious balcony is an attractive playing space for children, increasing the likelihood of them falling from there. This is especially dangerous in cases where adult supervision is lacking. Exacerbating the problem is poor balcony design in terms of child safety. In urban settings, falls from balconies have been recognised as a significant cause of injuries and deaths. Case studies and expert opinions suggest that in the majority of such cases, children climb and fall over the balcony railings, or they fall from between the railings.

In cases where children fall from high-rise windows (the second most important element in this study), the window design has an important bearing.

Protective grills and screens, as well as child-proof latches, would help reduce untoward incidents. While adult supervision would obviously make a major difference, the fact remains that a parent had been in the home/apartment when most of these accidents occurred. Therefore, parental perceptions that window screens are effective fall barriers might give a false sense of confidence, leading to them being less vigilant. Household furniture placed on balconies or close to windows contributed to almost one-fourth of the falls from high-rise apartments. Many parents did not realise that furniture and appliances helped their children gain access to a window opening.

Table 4: Fatal child falls from high-rise buildings

N	Years	Victim	Place	The cause of the accident
1.	2015	Male (5 years)	Eighth floor of an apartment in Taman Nirwana, Ampang	Fatal fall from the balcony of the eighth floor of an apartment in Taman Nirwana, Ampang
2.	2015	Male (3 years)	Ninth-floor apartment in Teluk Air Tawar	Climbing stacked boxes before falling out of the window
3.	2014	Male (8 years)	15th Floor of a Housing Flat in Ulu Pudu, Cheras, Kuala Lumpur.	Playing at fifteenth level before falling off the porch / balcony building
4.	2014	Male (2 years)	Apartment Elite Level 4, Putra Perdana, Sepang	Climbing the balcony before falling
5.	2014	9 years	Ninth-floor flat Taman Bukit Angkasa, Pantai Dalam, Kuala Lumpur	Slipped after climbing the balcony
6.	2014	8 years	Corridor fifth-floor apartment, Amazing Height, Sungai Udang Klang	The child tried to take the rubber ring on the fifth-floor corridor of his apartment ledge backfired as he slipped before falling to the ground floor
7.	2010	Male (6 years)	Falling from the 12th floor of an apartment in Selayang	The victim had fallen from the balcony of the 12th floor of a 20-storey building while left alone
8.	2004	Female (3 years)	14th Floor, Flat Pelangi Damansara, Kuala Lumpur.	Fell while playing on a bicycle leaning against the wall of the corridor

9.	2004	Male (6 years)	Fourth Floor, Flat Bijangga, Dungun, Kuala Terengganu, Terengganu.	Fell from windows because of emulating a superhero
10.	2003	Male (6 years)	Level 7, The Condominium Putramas, Puchong	Fell while playing on the balcony
11.	2002	Female (3 years)	Ninth Floor, Apartments Sri Panglima A, Bukit Saujana, Johor Baharu, Johor.	Climbed and fell out from window
12.	2001	Male (3 years)	Level 31, Condominium Sri Smart, Jalan Putra, Kuala Lumpur.	Climbed up and opened the window of the room before falling from the window
13.	2001	Male (3 years)	Level 18, Kinta Heights, Ipoh, Perak	Climbed a washing machine placed on a balcony

Sources: Adapted from National House Buyers Association (2015) and Releases Report (2001-2015).

CONCLUSION

In high-rise buildings, the absence of safety and preventative designs are causing more deaths and serious injuries from falls from such buildings. Young children falling from high buildings has been recognised as one of the most common causes of injuries and deaths. Falls from the balconies, windows, corridors, and stairs of apartments are less likely to result in death. Regulations are an important element of child safety and accident prevention. Many successful injury prevention interventions directly involve or are dependent on regulations and standards. Regulations can influence behaviour, products, or the environment in which children find themselves. Hence, building codes and standards in high-rise buildings should be continually improved and updated. The introduction of municipal standards for child safety in high-rise buildings must be considered. With careful planning and attention to detail, it is possible to incorporate many such principles into a building or development to improve child safety in high-rise buildings.

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DECISION MAKING PRINCIPLES IN LAND DEVELOPMENT APPROVAL

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Abstract

The inconsistency of legal coordination is one of the contributing factors in land use conflict. This scenario implicates various objections to the court due to the dissatisfaction of the landowners and developers with the decision of land development approval. In Malaysia, studies about land use conflict in land development conducted by previous researchers only cater on conflict factors and not in the perspective of its operational approach by the stakeholder. Therefore, this paper aims to identify the decision-making principles for decision-makers in grant land development approval. This paper adopts qualitative methods that consist of two types of data collection. The first method used was desk study analysis of ten (10) file cases of development application and the second method involved is an in-depth interview with selected respondents. The result from the analysis of ten (10) file cases determined the decision-making trends that were then cross-tabulated with the five principles of decision-making by using an in-depth interview with the selected respondents. The result from the analysis indicates five principles of decision-making which is intuition, rational, authority, factual, and experience. The findings of this paper contribute towards the aspects of strategic decision-making, decision-maker practices, and further research. A comprehensive decision-making principle will then minimise the risk of fallacy in decision-making.

Keywords: Land Use Conflict, Land Development Approval, Decision-Making

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INTRODUCTION

A development project is bound by legislation that has been set to ensure that any kind of development is carried out in a planned manner without creating turbulence to the community and the current land use planning. The law is fundamental in mobilising the function of a society as an agent of development, where the philosophy of its formation is aimed to provide guidelines and regulations of society appropriate behaviour. Based on Article 172 of the Federal Constitution 1957, the separation of powers principles have created rules in various fields including the aspects of land administration and development (Chun, J. Hai @ Ibrahim & Nor Fadzlina Nawi, 2012). Land matters are the jurisdiction of the state government as enacted in Article 74, and List 2 of the State List, Federal Constitution 1957. However, Article 76 (4) specifically empowers the Federal Government through Parliament to formulate laws that are relating to land matters for legal coordination (Yusof, MF, 2016). The enactment of this legislation includes the National Land Code 1965, Town and Country Planning Act 1976, Land Acquisition Act 1984, Strata Titles Act 1985, Local Government Act 1976, Roads, Drainage and Buildings Act 1974 and others. The coordination of the enacted law serves to support and codify the land matters for the national development agenda and can be realised besides the application of controlling and monitoring elements.

In peninsular Malaysia, the State Government is fully responsible for land matters. The jurisdiction of the land administration is divided according to districts level and special areas. Simultaneously for each district level, matters regarding land development jurisdiction have been given to the Local Authority. The local authority is responsible for development planning as it means that any development application must obtain planning permission from them. The local authority needs to ensure that any development application abides by the legislation, plans and regulations such as building laws, zoning, and land use planning. The local authority should also ensure compliance to section 120 of the NLC pertaining to land use conditions that is imposed by the State Authority in determining development approval. This scenario has created conflict in determining land use between planning contexts through planning guidelines under the Town and Country Planning Act (Act 172) as well as land use conditions on the document title as enacted under the National Land Code, 1965.

RESEARCH BACKGROUND

Land development activity is a complex process that is implemented by taking into account the various needs and desires of individuals, communities and stakeholders. Act 172 defines land development as carrying out building, engineering, mining works or changing the type of land use or building or subdivision of land boundaries and land consolidation. In other words, land development refers to the conversion of land from one use to another for various

purposes such as residential, commercial and industrial. This coincides with the definition by Cunningham, C. R. (2007); as well as Healey, P. & Barrett, S. M. (1990) that land development refers to any material change of land in the form of a building or site for various activities. However, the land-use change process needs to be well controlled through the existing regulations.

Theoretically, the enactment of the National Land Code (NLC) 1965 was made based on the context of land management and administration which is translated under the jurisdiction of the state. The purpose of land management and administration is not only to provide a medium for infrastructure development but also to indirectly hold the concept of income generation for the state government. Accordingly, the Town and Country Planning Act 1976 (Act 172) was enacted for the purpose of planning and controlling the current and future development.

The provisions of NLC 1965 and TCPA 1976 (Act 172) have their own respective interests in terms of planning and land development activities. The overlap in applicable legislation causes the violation of land use conditions that will directly affect the various parties, especially landowners and the state government. This scenario coincides with the statement of INSTUN (2007) which stated that conflict will occur due to the inconsistency of coordination of the legislation and authorities who are responsible for planning and controlling the development. Land use conflict arises in the land development approval process that causes stunted land development. This conflict was identified when there were variations of technical reviews by planners, namely PLANMalaysia and the Local Planning Authority, which contradicted the recommendation from the Land Office and the prepared paperwork from the State Land and Mines Office that had been brought to the State Authority for final approval. Hence, while technical reviews are very important in assisting the State Authority in deciding the final approval of the development application, the decision-making trend should be examined in determining the principle of decision making among the decision-makers.

LITERATURE REVIEW

Land Development Approval Process

Land development application shall be submitted to the local planning authority to enable the issuance of the planning permission before the commencement of any land development activity, with the exception of permitted development as enacted under section 19 (2). The necessity of planning permission in section 19 (1) of the Town and Country Planning Act (Act 172) was emphasised as mandatory. The failure to comply with the planning permission requirements may incur a penalty under section 27 and 28 of Act 172.

Land development application in Malaysia is based on five categories as enacted under NLC 1965, they are; land conversion (Section 124A), subdivision (Section 135), amalgamation (Section 146), and surrender and re-alienation (Section 203 and Section 204A-H). Land Development Application is based on categories or the single application can be submitted directly to the land office, while an application that is based on the special provision under section 203 and 204A-H (Surrender and Re-Alienation (SBBS)) must require planning permission through the One-Stop Centre (OSC) at the local planning authority.

Contrariwise with the current practice, the state of Johor has implemented a slightly different approach. Land development application in Johor can be submitted based on a single application through section 124 (land conversion) and is based on the special provision under section 197/200 cross-refer to section 76 (Surrender and Re-Alienation (SBKS)). Land development application through a single application includes the process of SBKS without requiring planning permission. However, land development application through SBKS requires planning permission before the SBKS submission. As in any land development application that requires planning permission, the application must be submitted to the local planning authority in order for them to process it through the One Stop Centre, the One-Stop Centre coordinates technical agencies in land development to provide technical reviews on a development application that enables concurrent development approvals. It allows applications to be submitted simultaneously to the required technical agencies especially the District Land Office and the Local Planning Authority. The concept of technical agencies integrations in the One-Stop Centre enables an effective service delivery system in land development.

Conflict of Land Use

The impact of land-use change has raised several issues (Petit CC, 2002; Christopoulou et al. 2007; Jomaa et al, 2008; Paul & Tonts, 2005). Section 5 of the NLC 1965 provides that alienated land is any land under that is under a registered title that has been granted by State Authority based on certain conditions or that has been given based on any land legislation in force. In granting the land ownership, the State Authority must first determine the area of land, tenure, type of title, annual tax rate, premium rate, land use category, express conditions and the restrictions of interest on the land. Once the land is successfully registered to the landowner, the title is guaranteed by the State Authority through section 340 (Indefeasibility of Title) NLC 1965. This means that the landowners can maximise the use of the land by complying with the land conditions that have been imposed on the land, based on section 120 NLC 1965 which must be cross-referred with sections 115, 116 and 117 NLC 1965. If the owner wants to carry out development that does not coincide with the conditions

of the land that is gazetted by the State Authority, the owner can apply for a variation of condition (section 124 A) through a direct application or a simultaneous application through Surrender and Re-Alienation as provided in section 203 and 204 A-H and section 197, cross-refer to section 76 as implemented in the State of Johor

Although, NLC 1965 has stated that land ownership belongs to certain landowners but the development on such lands are bound by a plan that has been made at the local level (Syazlina, 2019). The provision of subsection 22 (3) of Act 172 clarifies the statement that the local planning authority can approve or refuse to grant planning permission and that its consideration is subjected to the gazetted Local Plan (LP). This means that the land development must also take into account the aspects of planning at the local authority level as in the Town and Country Planning Act 1976 (Act 172), which has been enacted as a more comprehensive land use development control measure.

In the current practice, land-use conflicts arise when the Local Authorities rejects the planning permission of certain application due to the failure of the proposed development plan to comply with the zoning requirements as per the Local Plan. However, this contradicts with the recommendations from the land office and paperwork from the Land and Mines Office that will influence the final decision that is made by the State Authority. Due to the planning authority's rigidity in granting planning permission that is based on gazetted zoning, the land administrator will give its recommendations based on the compliance to the express and implied condition of the land title as enacted under the NLC 1965. These two documents are deemed to be inconsistent in the aspect of approving land development applications which have been proven to have a direct impact on landowners, investors, and also the stakeholders. The difference of resolution between the two sources of legislative power must be dynamic to ensure that the objectives of development fulfil the needs of the society.

Decision-Making in Land Development Approval

Conflict can be a catalyst for improvement in land governance and prevents bureaucratic routine (Forester, 2013; Griggs et al, 2014; Paoli, 2008). To avoid or minimise conflict, good decision making is crucial. Decision-making is an intellectual process that involves a selection of one course of action out of many alternatives. Decision-making involves the selection of a course of action from among two or more possible alternatives in order to solve a given problem (Suraj Panpatte, V.D Takale, 2019). The main functions of decision-making in the public sector are to deliver excellent service to society (Bercu, 2013). Dillon et. al. (2010) stated that the process of decision-making in the public sector starts with vague objectives and goals, which are then followed by searching for the alternatives and solutions to accomplish it. Typically, decision-making in the public sector is related to various conflicts, the controversial and high influence

of external factors (Ring & Peryy, 1985; Kotler & Lee, 2007). The public sector has always faced a very complicated and risky decision, political forces, the stakeholders are involved in decision-making which leads to a slow process of making decisions due to the delays, interruption from an outsider, changes in the decision and greater number of formal meetings with various parties in order to make a decision (Nutt, 2005; Kotler & Lee 2007). In the land development process, decision-making takes place in every phase but the most crucial part is at the stage of the land development approval. Since the land development approval phase is seen as an enabler for the commencement of any land development, the decision-maker who is involved should establish an *acumen persona*. The land development approval process involves a variety of decision-makers in each process. Figure 1 illustrates the summary involvement of the said decision-makers.

The illustration in Figure 1 also applies for the single application especially under Section 124 (variation of condition) however; the application is not submitted through the OSC. As single application is submitted directly to the land office, the technical reviews are still needed as aforementioned in the procedures of surrender and re-alienation (SBBS/SBKS). Technical reviews from all agencies will influence the State Authority's decision of approval. This reflects the importance of giving precise technical reviews in accordance to the expertise of their respective fields.

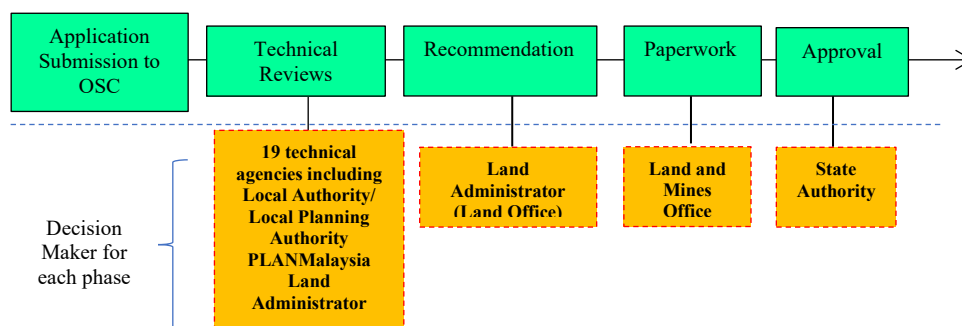


Figure 1: Decision-maker Involvement in Land Development Approval Process

In giving technical reviews, most technical agencies have been provided with general rules or the knowledge as to what to consider and what to look into but the fact is that the decision-making process is not only influenced by the guideline but also other factors such as, rationale factors, physiological factors, social factors and cultural factors (Shahsavarani, A. M., & Azad Marz Abadi, E., (2015)). Table 1 shows the most significant basis or principles of decision making in general manner based on previous research. According to

table 1, there is five most significant principles of decision making which are rationale, intuition, facts, experience and authority. These five principles correlate directly and indirectly in the land development decision-making process.

Table 1: Summarisation of Decision-Making Principles by Previous Research

Authors (Years)	<i>Rationale</i>	<i>Intuition</i>	<i>Facts</i>	<i>Experience</i>	<i>Power (Authority)</i>	<i>Intention</i>	<i>Value</i>
Terry, George R. & Leslie W. Rue. (2008).	x	x	x	x	x		
Harteis, C., & Billett, S. (2013).	x	x	x				
Yechiam, E., & Aharon, I. (2012)	x	x	x	x			
Shahsavarani, A. M., & Azad Marz Abadi, E. (2015)	x	x	x	x	x		
Alavi, S. A., Rezaei, S., Valaei, N., & Wan Ismail, W. K. (2016).	x	x	x	x			
Gold, J. I., & Shadlen, M. N. (2007)	x	x	x			x	x
Amiruddin, M. S., & Karima, M. K. (2019)	x	x	x	x	x		

METHODOLOGY

As this research is exploratory in nature, the data collection process has been divided into two phases. The first phase involves data collection through case studies. Ten (10) cases of land development applications in Johor have been selected and analysed using the method of content analysis. The selected cases will be coded as C1, C2, C3, C4, C5, C6, C7, C8, C9 and C10. The output from the content analysis determined the decision-making trends in the process of land development approval. The identified trend has been cross-tabulated with the five principles of decision-making which is a continuation of the data collection in phase two. In data collection phase two, the cross-tabulated data was verified using an in-depth interview with selected respondents. Respondents have been selected using purposive sampling. The respondents involved are listed in Table 2. The decision-making trend through case studies are explained and tabulated with the principles of decision-making that have been coded as: Factual (P1), Intuition (P2), Experience (P3), Authority (P4), Rationale (P5) to the respondents in order to capture their perception and justification.

Table 2: List of Selected Respondents

Group	Agencies	Type of Respondent	Respondent Code	No of Respondent
1	PLANMalaysia	Planners	R1, R2, R3	3

2	Local Authority	Local Planning Authority	R4, R5, R6	3
3	District Land Office	Land Administrator	R7, R8, R9	3
4	Land and Mines Office	Chief Assistant Director	R10, R11, R12	3
Total Respondents				12

The data from the in-depth interview are analysed using the method of descriptive analysis, which has produced a set of principles of decision-making that has been applied by the decision-makers in the process of land development approval. The principles of decision making are then detailed out to find the element that will act as a guideline for the decision-makers in their decision-making consideration.

RESEARCH FINDINGS AND ANALYSIS

Decision Making Trend in Land Development Approval

The decision-making trend analysis has been identified through content analysis based on the ten (10) case studies of land development application in Johor. The result from the analysis shows a variation of decision-making that has been made by the decision maker. The decision-making trend from the ten (10) cases are summarised as shown in Table 3.

Table 3: Analysis of Decision-Making Trend by Five Agencies for Ten (10) case studies

Case Agencies	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
PLANMalaysia	/	/	/	/	/	/	x	/	/	/
Local Authority	/	/	x	/	/	/	x	/	/	/
Land Office	/	/	/	/	/	/	/	/	/	/
Land & Mines Office	/	/	/	/	/	/	x	/	/	/
State Authority	/	/	/	/	/	/	x	/	/	/

Based on the analysis, the variation of decision-making trends has spotted when there is an inconsistency in the decision-making process from the planners for a few cases which are C3 and C7. Decision-making by the planners is important because a development application needs to obtain the Planning Permission at this stage before the commencement of the development. The local authority did not agree with the development application because it contradicted the zoning that was stated in the local plan. In the case of C3, although the local

authority as the local planning authority did not approve the application, PLANMalaysia justified that the development application can be considered. The decision-making inconsistency in this case shows that the element of the approval consideration does not only refer to the prerequisite local plan, and therefore does not fix the problem.

Justification from the Land Office and the Land and Mines Office stated that the development application should be considered and the land title registration was given before the local plan. At the final stage of the decision – making process, the State Authority gave full approval to the development application. In contrast to the case in C7, both PLANMalaysia and the local authority did not approve the development application due to the contradiction with the gazetted zoning and the fact that it was not suitable. However, the land office justified that the development application should be considered. In opposition to that, the Land and Mines Office supported the disapproval of this application as per PLANMalaysia’s justification and that the application was rejected by the State Authority. Upon reflection on this, it can be concluded that there are other elements of consideration that are used by the decision-makers in considering an application.

For the cases C1, C2, C4, C5, C6, C8, C9, and C10 the decision-making trend was consistent for each agency although there was a conflict between the development applications and the zoning in the local plan. The approval was given based on the discretion of the decision-makers. This indicates a decision-making gap which is the determination basis that the decision-makers have applied in considering the approval of a development application.

Decision-Making Principle in Land Development Application

The decision-making trend analysis in the data collection Stage 1 has been tabulated with the five (5) principles of decision-making in order to validate the decision-makers basis in determining the decision of the development application. Through the interview, the selected respondents were briefed on the ten (10) case studies as well as decision-making trends by the decision-maker. The respondents were asked to select the decision-making principles that were suited with the decision-making trends as seen in the ten (10) cases. In addition, the views from the selected respondents are also taken into account in justifying the selected basis and principle that have been used by the decision-maker in the decision-making consideration. The results are illustrated briefly in Table 4.

Table 4: Analysis of Decision-Making Principle

Principle	Principle 1	Principle 2	Principle 3	Principle 4	Principle 5
Case					

C1	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C2	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C3	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C4	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C5	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C6	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C7	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C8	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C9	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12
C10	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12

The results from the analysis showed that all the respondents were in agreement that the five (5) principles of decision-making were applied in the development application approval. The five principles mentioned are Factual (P1), Intuition (P2), Experience (P3), Authority (P4), and Rationale (P5).

Factual (P1)

All respondents agreed that the factual is the principle of decision-making that must be applied by decision-makers. Decision-makers should know and investigate the facts of case before any decision is made. When the development application is submitted to the OSC to get a review from the technical department, R1, R2, R3, R4, R6 have stated that the decision-maker should identify the zoning of the area and the current development on the land plan. R5, R7, R8, R9, R10, R11 and R12 stated that the land background should also take into account the basis for its alienation, physical or non-physical encumbering event to the extent of what was already built on the land, title registration date and land category (express condition and implied condition). Thus, it can be summarised that decision-makers in land development applications should take into account the element of zoning, current development on the land and the background of the land before any decision is made. This element will help decision-makers in good decision-making. Decision-making that is based on facts is more secured in judgement and will achieve better performance than others.

Intuition (P2)

Decision-making based on intuition is subjective and vulnerable. However, decisions made through intuition are provided by knowledge that is stored in the long-term memory that has been primarily acquired through associative learning. The input will be processed automatically and without conscious awareness. The results from the analysis shows that all the respondents have agreed that decisions that have been made on the ten (10) cases also influenced by intuition. The basis of intuition in the development application decision is divided into three categories which are affective, cognitive and behavioural intuition. Respondents R1, R2, R3, R4, R5, R6, R7, R8, R9, 10, R11, and R12 agreed that the sense of responsibility had influenced the type of decision. Other than that, respondents R9, R10, R11 and R12 also stated that positive thinking helped the decision-maker in good decision-making. Respondents R7 and R8 have also justified that decisions that have been made through intuition can help the decision-maker to reflect and visualise the development application and decisions that will be made. The action of the decision-makers in referring to an authoritative level in order to get a clearer picture, or perspectives of an expert on the development application is driven by intuition. This statement was agreed by respondents R1, R2, R3, R4, and R5. Respondents R1, R2, R3, R4, R5, R7, R8, R9, R10, R11, and R12 agreed that the decision-makers cannot be biased when giving an approval based on the background of the applicant which reflected behavioural intuition.

Experience (P3)

Analysis from the tabulated data shows that, all the respondents have agreed that experience will influence the type of decision-making that is made in the land development application. All the respondents have agreed that the more experienced the decision-makers in their agencies are the more literate they will be in considering the development application decision. Thus, the decision-makers experience can help in predicting the state of things and in anticipating the impact of the decision that is made.

Authority(P4)

The result from the analysis shows that all the respondents have agreed that power directly influences the decision-making trend. According to the perspectives of decision making in the land development application, the principle of authority can be influenced by the position of the decision-makers in the agency, the level of education as well as the level of authority. This influencing factor is agreed by all the respondents. R1, R5, R7, R9 have stated that in deciding the approval of the development plan, decision-makers sometimes need to refer to the experts and cross-reference with other agencies in gaining more information about a development application. In approving the development applications, sometimes

they cannot be limited and restricted to be based only on the scope of the power of the decision-makers.

Rationale (P5)

Rationale is crucial in decision making since decision making in land development approval does not have specific guidelines. Based on the analysis, all the respondents have agreed that the rationality of the decision-maker is important in approving or rejecting the development application. R1, R2, R3 and R4 stated that the decision-makers should focus on problem-solving as a whole, while R5, R6, R10, R11 and R12 emphasised that the rationality of the decision-makers should include the implementation of relevant legislation with dynamic action besides the focus on fixed legislation.

To sum up the results from the analysis there are five (5) principles of decision-making that must be applied by the decision-makers in approving or rejecting a development application. The result from the analysis is summarised in Table 5.

Table 5: Summary of five decision making principles in land development approval

Principle of Decision Making	Elements
Factual	<ul style="list-style-type: none"> • Zoning • Current development on the land • Land background
Intuition	<ul style="list-style-type: none"> • Feeling of responsibility, • Positive thinking, • Reflect and visualisation of the application and decision • Refer to authoritative level • Un-bias in processing development application
Experience	<ul style="list-style-type: none"> • Years of experience in the job position • Years of experience in decision making
Authority	<ul style="list-style-type: none"> • Position of the decision maker in the agency • Level of education and level of authority
Rationale	<ul style="list-style-type: none"> • Focus on problem solving as a whole • Implementation of relevant legislation with dynamic action

CONCLUSION

Decision making in land development approval is a set of decision that results from the interaction and integration of various agencies. Decision-makers are responsible for the outcomes that are consonant with their system and organisational objectives. The different types of decision-making pattern which

cross-culturally can create conflict, in the context of land development approval, thus necessitate the decision-makers who are involved to strive for a mutually acceptable solution despite possessing different values, personality and organisational background. In line with the goals of decision making in land development approval, the five basic principles that have been detailed out the element can serve as a guide for decision-makers in the future.

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INTEGRATION OF SUSTAINABILITY INDICATORS IN URBAN FORMATION: A GAP ANALYSIS

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Abstract

Cities and urban centers are made for people and not vice versa. However, many policies on urban formation fail to take cognisance of human factors in their design and planning. Restructuring of cities to accommodate the economics and environmental demand of urbanisation alters the organic urban form. Modernists often concentrate on road construction, fresh air circulation, light, space, space for vehicles, etc., but ignore city architecture's social dimension. This study explores the psychological aspect of cities and housing due to the trends in the land-use change in sustainable city agenda with specific reference to Ibadan City. This work is an extract of research on the community perspective of land-use change on social sustainability. Data were collected through a structured questionnaire from 397 residents of the Central Local Government and analysed using Partial Least Square - Structural Equation Modelling (PLS-SEM) and Relative Importance Index (RII). The results show the urban form characterised by land-use change and its consequential effects on social sustainability. The alteration of the urban form through land-use changes by individual landowners' decisions impacts others' social sustainability. It was recommended that policymakers incorporate the sustainable social elements into the planning procedure.

Keywords: Urban Form, Social Sustainability, Liveable Community

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INTRODUCTION

The urban form explains the characteristics of a city and displays its whole layout, location, and potential growth in relation to other cities and settlements. The urban form may be influenced by planning regulations and the land-use change process. The land-use change process may have a consequential effect that may be positive or detrimental to the community's social sustainability. Many factors sum up to consider a community liveable. These factors include the natural and built environment, social stability, equity, safety, economic stability potential, educational prospect, and cultural and recreational advantages (Aulia, 2016).

Countries worldwide have adopted different approaches towards creating a liveable community; some approach it by monitoring the newly developing communities, while some focus on developing the existing neighbourhood to create a new setting. For instance, the US' direction is more of an increasing density, promoting land mix and functioning transport to create a liveable environment. At the same time, the UK concentrates on renewing the old existing community to meet a modern, liveable environment (Stevens, 2009). Liveability is a combined effort of urban activists, including the architect, planners, and community inclusiveness. Liveability is confirmed when the residents are part of the decision and management of the environment.

LITERATURE REVIEW

Urban Form

The word 'urban form' defines the characteristics of a city. Urban form involves the city's entire layout, current location, and potential growth connected to other towns and settlements in the more extensive network of towns and urban regions (Sharifi and Yamagata, 2018). Urban form refers to the urban area or its parts' scale, shape, and configuration.

Understanding urban form is necessary to understand the attributes of a city, metropolitan area, or village. This understanding is achieved by examining the components' characteristics, the control or occupation, and ownership pattern. Urban type is carefully linked to scale and is defined as the morphological features of a city environment (Williams et al., 2000). The scale of urban form involves individuals' building, urban block, the street, city, and neighbourhood, which explains how an urban form is measured, understood, shaped, and analysed (Dempsey et al., 2011). Other approaches to explaining urban form include physical facilities and the person acting (Lynch, 1984). Hence, urban form is made up of the environment and the people. Urban land-use theories have been subjected to series of critiques and amendments. The urban environment is complex; classifying it as an easily understandable and explainable concept might be a gross mistake.

Scholars have attempted to explain urban land-use theories to clarify it, and despite their efforts, it remains challenging to leap into a particular definition

or theory of urban environment. Cities are complex, and the driving forces of urban formation and expansion vary from city to city. Thus, the number of city nuclei and their purpose differ from one city to another. The bigger the population, the larger the nuclei. On this note, Fabiyi (2006) studied city centres in the African setting, particularly Nigerian urban settlements, the scholar discovered many city nuclei, including traditional, commercial, new, administrative, political, and industrial centres. Research evidence clarified that no city theory could unilaterally predict a city's formation, creation, and structure. Each theory is unique and has a unique history, pattern of transition, and structure. As urbanisation sets in, the city undergoes a series of land-use changes from the initial concept.

Concern about land-use change in the holistic direction has been a matter of great concern in recent times. Nkolika et al. (2018) reasoned that change is a regular occurrence and inevitable. Land-use transition is unanimous with the development of any emerging economies, such as Nigeria (Chen *et al.* (2014); Hertel *et al.* (2011). Land use changes is a continuous development due to insatiable human character and the highest and best use (Nkolika et al., 2018). Where land demand is strong, its immobility and limitations bring competition amongst its numerous uses (Rösch *et al.*, 2010). Landowners act rationally by switching use from low-use demand profile to highly competitive use profile to maximise benefit from an economic perspective. Economic sustenance and benefit and the local planning authority's need to accommodate the new development determine land-use reform (Hertel *et al.*, 2011).

Urban Social Sustainability

Urban social sustainability planning is not a straitjacket nor a mere adoption of a particular country's planning concept. It embraces cross-examination of the variables for making a community liveable, which varies from place to place, hence the need for collective efforts of all community stakeholders. A sustainable community does not focus on a single building concept; the focus is on the neighbourhood and the community. The concept of a single building or a single-use is the cause of land-use conflict expressed in most urban cities. The absence of a master plan for the community is responsible for the haphazard development of most urban neighborhoods in developing urban environments.

Sustainability has been a central philosophical paradigm for urban growth since 1987 when advocacy for sustainable development became more pronounced. The World Commission on Environment and Development (WCED) introduced sustainable development in the Brundtland report popularly referred to as *Our Common Future*. The aim was to initiate a global agenda to resolve the degradation of social and natural environments that have aggravated right from the industrial revolution (Hall et al., 2015).

Sustainable urban development is a big task to achieve due to its dynamism, complexity, and continuously evolving nature (Lützkendorf and Balouktsi, 2017). Many urban communities find it challenging to attain sustainability, and the introduction of urban renewal exercises performed by the government in urban communities sometimes ended up being unsustainable. More often than not, the reason may be sidelining the local institution, homeowners, unions, and associations in the development process and managing the urban revitalisation facilities.

Social sustainability is still under-theorised and vague in definition, criteria, and measurement system. Woodcraft (2012) reasoned that moving from theoretical and abstract debate ascribed to social sustainability's definition to the investigation and operational aspect of urban social sustainability is expedient. Community sustainability is the urban community's capacity to maintain and replicate to operate at a scale appropriate to community members (Dempsey et al., 2011; Yiftachel and Hedgcock, 1993).

Although social sustainability has several definitions, Eizenberg and Jabareen (2017) noted that it lacks a coherent and useable definition. Rashidfarokhi et al. (2018) added that it is hard for social sustainability to have a precise definition, the scholar has a divergence of opinion that the social sustainability definition does not offer a definite tool for the planning process. The scholar proposed a tool or series of indicators that can guide the planners in their planning process. Rashidfarokhi et al. (2018) proposed 26 social sustainability indicators under six themes as presented in Table 1.

The grouping of indicators into general themes improves the comprehension and applicability of instruments when assessing real-life planning. The scholars' claims premised on (Pearce and Vanegas, 2002) belief that a restricted scope and few requirements enhance adequate monitoring and evaluation of a physically and economically feasible procedure. The sustainability indicators under the six (6) groups identified by Rashidfarokhi et al. (2018) are adopted in this research work. The choice is to make it focus principally on the land-use social sustainability-related issue.

Table 1: The Six General Themes and the 26 Related Social Sustainability Indicators
 (Rashidfarokhi et al., 2018)

Indicators	Themes
Community Vitality	Social Cohesion
Active Community Organisations	
Citizen Perception of Government Performance	
Innovation and Proveness	
Social Solidarity	
Civic Engagement and Volunteerism	
Trust and Optimism	Social Capital
Access to Civic and Public Spaces	

Indicators	Themes
Social Civic Networks	
Social Values	
Social Norms	
Diversity	Social Inclusion
Arts and Culture	
Social Integration	
Social Mixing	
Equal Opportunities and Access to Resources	Equity
Gender Equality in the Economy	
Equity for Minorities and Disadvantaged Groups	
Inter and intragenerational Equity	
Knowledge Management	Community Participation
Partnership and Collaboration	
Community Empowerment	
Security	Safety
Freedom	
Resilience	

METHODOLOGY

The research was based on interviews, observation, and documentary analysis. Survey research was conducted, and 397 community residents were served with structured questionnaires to obtain data towards answering this research question. The study focused on the impact of land-use change on Ibadan central-local government community social sustainability. The survey included both males and females: 52.1% males and 47.9% females. 92.2% of respondents had an income source. Among the respondents, 98.2% were married, signifying responsibility and reliability. The study is exploratory with a sequential mixed model methodology. Data obtained from respondent data were organised, presented, and summarised by descriptive statistics using statistical parameters including frequencies, means, standard deviation, and confirmatory factors analysis using IBM SPSS statistics version 22 and Partial Least Square - Structural Equation Modeling (PLS-SEM). The experts in the land-use-related field were relied on for the model validation.

Ibadan Land-use Pattern

The case study is the Ibadan central-local government, Oyo State, Nigeria. As shown in Figure 1. Based on the 2006 population census, Ibadan city recorded 3.8 million people (Olowoporoku et al., 2017). Its rapid growth is traceable to its 19th-century refuge city and the advantage of being Nigeria's former western province headquarters (Oladele and Oladimeji, 2011). Ibadan's nodal location advantage made it a business zone. The railroad from Lagos to the northern part of the country arrived in Ibadan in 1901; the roads from Kano, Kaduna, Sokoto

Ilorin Oyo, Oke Ogun, Ondo, Ilesha Ife, and Oshogbo all converged at Ibadan on the way to Lagos.

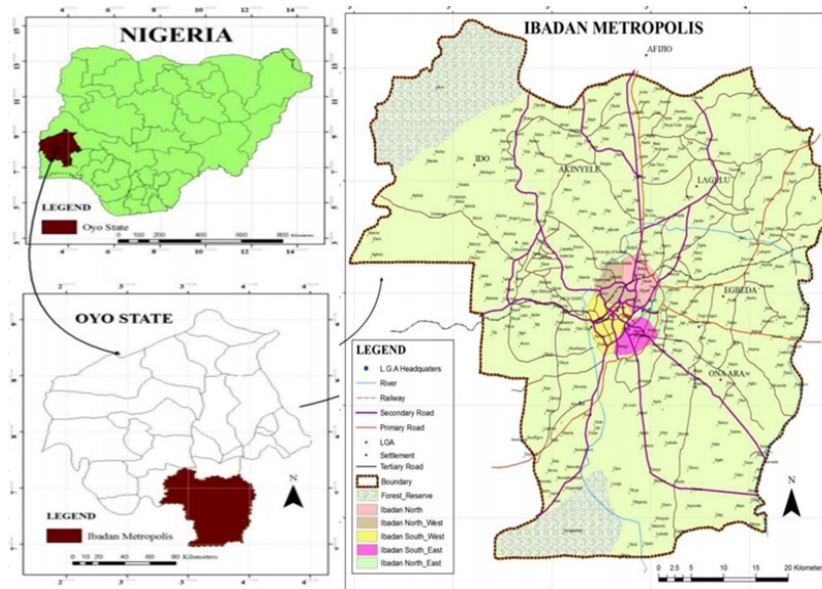


Figure 1: Map of Oyo State xhowing the understudied five Local Government Areas in Ibadan City.

Source: International Institute of Tropical Agriculture, Geospatial Unit (2013)

There is virtually no low-density sprawl in the Ibadan metropolis. Since 2003, the low-density sprawl was built as high-density or medium sprawls, as indicated in Figure 2. Ibadan metropolis' development represents an unscheduled and ill-structured condition. To a large degree, urban growth in Ibadan took place without regard for urban legislation (Adelekan, 2016). Over the years, over 826 km of vegetation covers have been used for urban construction. It is also worth noting that the old airport, which was initially designated as the open fields and low-density areas in 1984, was subdivided for commercial land use and surrounded by a medium-density outlook (Fabiya, 2006).

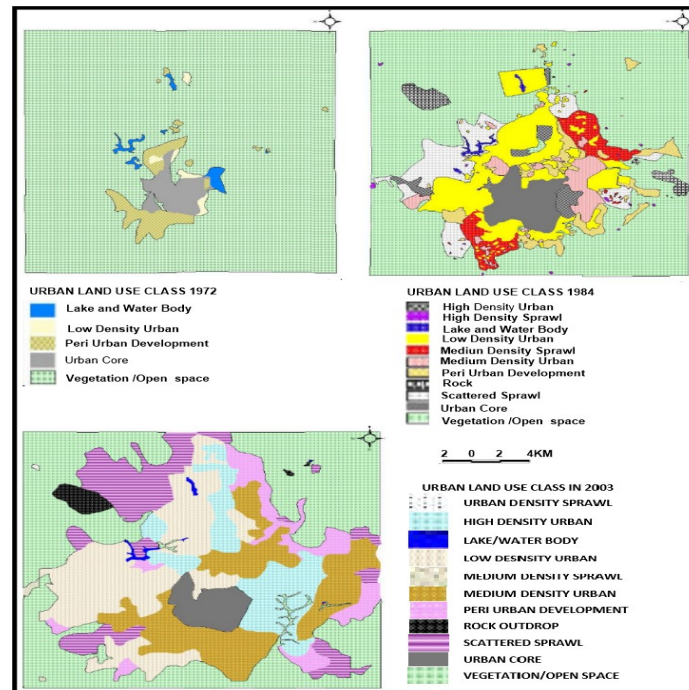


Figure 2: Urban Land-use Classes in Ibadan Region, 1972 to 2003
 Source: Fabiyi, 2006

Some salient factors underpin Ibadan's unplanned land-use shift. Fabiyi (2006) identified industrialisation and culture as part of Ibadan's land-use transition triggers, and its fallout is ill.

RESEARCH FINDINGS AND DISCUSSION

The survey revealed that communities are aware of the social sustainability indicators relevant to urban form and land-use planning. The RII result on the social sustainability indicators analysis falls within 0.6388 and 0.9154. The RII value obtained passed the threshold value of $RII \geq 0.6000$, showing that all the indicators are fundamental as assessed by the community. Social value was rated 1st with RII 0.9103 by the sampled respondent members of the community. The issue with land-use planning and development is that governments and individuals assign more importance to economic benefit and development and less importance to the effect of land use on humans in the planning process. However, people are the centre of any planning and development. Kenter et al. (2015) described social value as community price, i.e., cultural value, mutual interest, and things contributing to public welfare or well-being. Accessibility to institutions, community networks, community engagement and volunteerism, and trust and optimism have RII values of 0.9113, 0.9103, 0.9098, and 0.8891,

respectively. Security has RII 0.7476 with 21st in ranking; this speaks that when other factors are well cared for, the community's safety is guaranteed. Social mixing is last in the ranking with RII 0.6675, although it is not a sign of weakness as the RII value far exceeds the threshold value of $RII \geq 0.6000$, as shown in Table 2.

The social sustainability factors assessed include social capital, social cohesion, social inclusion, equity, safety, and community participation. Social capital has a mean score value of 4.48, ranked 1st, social cohesion with a mean score value of 4.02, ranked 2nd, equity, safety, community participation, and social inclusion with mean score values of 3.9, 3.83, 3.67, and 3.54, ranked 3rd, 4th, 5th, and 6th, respectively. All the constructed mean score exceeded 2.333 which imply that they are crucial factors to urban changes as shown in Table 2.

Table 2: Sustainability Indicators Relative Importance Index (RII)

Indicators	X	X/Rank	Construct	RII	SD	Rank (overall)
Community Vitality	3.846	4 th	4.02 Cohesion	0.7693	0.674	16 th
Active community organisations	3.657	6 th		0.7315	0.748	22 nd
Innovation and process	3.652	7 th		0.7305	0.732	23 rd
Social solidarity	4.005	3 rd		0.8010	0.905	10 th
Citizen perception of government performance	3.829	5 th		0.7657	0.732	17 th
Accessibility to institutions	4.557	1 st		0.9113	0.636	2 nd
Community engagement and volunteerism	4.549	2 nd		0.9098	0.578	4 th
Social Values	4.577	1 st	4.48 Social Capital	0.9154	0.605	1 st
Access to public spaces	4.395	5 th		0.8791	0.854	7 th
Community Networks	4.552	2 nd		0.9103	0.628	3 rd
Trust and optimism (not breaking social tie)	4.448	3 rd		0.8897	0.689	5 th
Social Norms	4.411	4 th		0.8821	0.655	6 th
Diversity	3.370	3 rd	3.54 Social Inclusion	0.6741	1.242	25 th
Arts and culture	3.965	1 st		0.7929	1.344	12 th
Social integration	3.481	2 nd		0.6962	1.294	24 th
Social Mixing	3.338	4 th		0.6675	1.382	26 th
Security	3.738	3 rd	3.9 Equity	0.7476	1.420	21 st

Indicators	X	X/Rank	Construct	RII	SD	Rank (overall)
Freedom of expression	3.849	2 nd		0.7698	1.466	15 th
Community Resilience	4.108	1 st		0.8217	1.398	8 th
Partnership & collaboration	4.045	1 st	3.67 Com. Participation	0.8091	0.815	9 th
Knowledge Sharing	3.194	3 rd		0.6388	0.880	18 th
Community Empowerment	3.778	2 nd		0.7557	0.756	20 th
Equal Opportunities and access to resources	3.783	3 rd	3.83 Safety	0.7567	0.936	19 th
Inter & intragenerational equity	3.947	1 st		0.7894	0.678	13 th
Equity for minorities and disadvantaged groups	3.892	2 nd		0.7783	0.702	14 th
Gender Equity	3.680	4 th		0.7360	1.454	11 th

Table 3: Side Effects of Land-use Change and Social Sustainability by Bootstrapping

Construct-> Social Sustainability	Original Sample (O)	Sample Mean	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Social Cohesion Factor	0.629	0.622	0.043	14.493	0
Social Capital	0.132	0.13	0.051	2.577	0.01
Social Inclusion	0.189	0.185	0.049	3.817	0
Social Factor	0.116	0.114	0.041	2.844	0.005
Community Participation	0.223	0.219	0.023	9.814	0
Equity	0.322	0.317	0.029	11.039	0

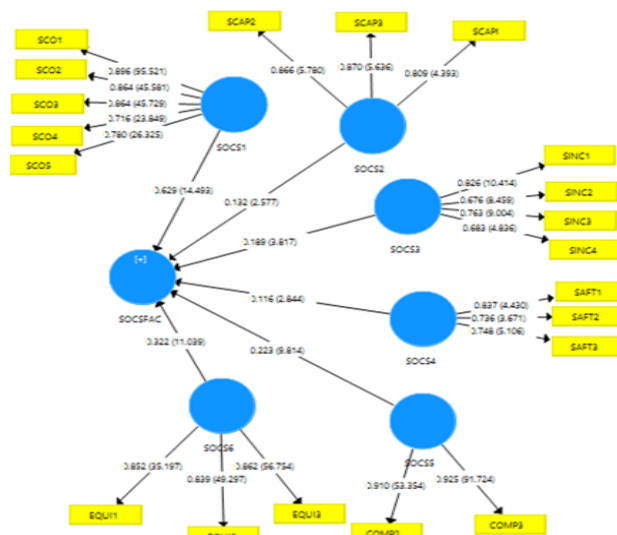


Figure 3: Social Sustainability Indicators Bootstrapping

Further analysis was conducted on social sustainability construct by bootstrapping. The result of the investigation is presented in Table 3 and Figure 3. Social cohesion factors with its indicators, such as community vitality, active community organisations, innovation and process, social solidarity, citizen perception of government performance, accessibility to institutions, and community engagement and volunteerism, were operationalised on the endogenous construct (social sustainability construct). These metrics with T-statistics of 14.493 at a p-value of 0.000 cooperatively represented a direction coefficient of 0.629 on social sustainability. This finding suggests that social cohesion largely influences social sustainability. The results correlate with Schiefer and van der Noll (2016) view that sustainable development is achievable in an atmosphere of social cohesion, where people have strong family and personal relationships, a sense of belonging, protection, and help and value differences.

The social capital component with T-statistics 2.577 at a p-value of 0.001 represented a social sustainability coefficient of 0.132, as seen in Figure 3. This outcome shows that social capital impacts social sustainability. Society views social capital as a key factor in social development; social capital creates social ties and improves lives (Schiefer and van der Noll (2016).

Collectively, with T-statistics of 3.817 at a p-value of 0.000, social inclusion metrics presented a social sustainability path coefficient of 0.189. The outcome suggests that social inclusion is significant in social sustainability. Stakeholders view social inclusion as a critical element in social sustainability.

This finding is in line with the study by Polèse et al. (2000), which stressed that all community stakeholders must be all-inclusive for the community's well-being.

Aggregately, safety factor metrics revealed a path coefficient of 0.116 on social sustainability with T-statistics of 2.844 at a p-value of 0.000. This finding shows that the safety factor has a major effect on social sustainability. More importantly, the safety concept is the ontological foundation of social sustainability (Eizenberg and Jabareen, 2017). The value of safety to the socio-environmental needs is acknowledged as one of the ingredients of sustainable development.

Community participation was operationalised on social sustainability. The indicators collectively gave t-statistics of 9.814 at a p-value of 0.000 with a social sustainability path coefficient of 0.233. This finding suggests that community involvement significantly affects social sustainability (Figure 3 and Table 3). The stakeholders consider the involvement of the community essential for social sustainability.

The social sustainability characteristics of the equity factor were assessed. Equity variables with T-statistics of 11.039 at a p-value of 0.005 represented a social sustainability direction coefficient of 0.322. Consequentially, fairness has an enormous impact on social sustainability. Equity is seen as a critical element in the community's social survival in this report. Discrimination is a conflict promoter within and between groups in society (Berg *et al.*, 2018)

CONCLUSION

Social sustainability factors such as public health, economic growth, distribution of wealth, social value, and cities' attractiveness can be influenced by urban form. Public and private interests linked to land use need to be balanced to enable social sustainability. The alteration of the urban form through land-use change by individual landowners' decisions impacts others' social sustainability.

Recognition should be given to factors transforming the urban form. Land-use planners should be proactive in managing urban land use. The interconnectivity between the causes of changes in land-use and social sustainability measures should be observed and valued.

Policymakers should incorporate the sustainable social element that comprises social cohesion, capital, inclusiveness, equity, and safety into the planning procedure.

Prioritising physical or economic interest over the community social sustainability should be discouraged.

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THE RELATIONSHIP OF LAND USE CHANGES AND LAND SURFACE TEMPERATURE FOR URBAN AREA IN KUCHING, SARAWAK

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Abstract

Land surface temperature (LST) is used as an indicator for land temperature. Previous research demonstrates a strong correlation between urban growth and land surface temperature. The rising of land temperature will lead to urban heat island if there are no preventative precautions done. Due to the area's rapid urbanisation, this study will focus on Kuching City. Matang Jaya, Tabuan Jaya, Satok, and Batu Kawa were chosen as case studies. These areas are rapidly developing, with new townships and population growth. The Landsat 7 data set was used as secondary data in this study. Spatial and thermal analysis were performed on the output using ERDAS software and ArcGIS. The analyses derived land use changes between 2005 and 2017, temperature statistics for land use types, and LST retrieval for case studies. The result indicates that the land surface temperature increased with the case studies' physical development.

Keywords: Land Use Changes, Land Surface Temperature (LST), urban growth, spatial analysis, thermal analysis

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INTRODUCTION

Land Surface Temperature (LST) is a critical parameter for studying the thermal environment and dynamics of cities. LST affects the air temperature in the lower layer of the urban atmosphere and is a significant factor in determining surface radiation and energy exchange, building internal climate, and human comfort in cities (Voogt & Oke, 2003). Rapid changes in land use and land cover patterns resulted in significant changes in LST (Choudury et al., 2018). Urbanisation was found to have a significant effect on local temperatures (Chapman et al., 2017). According to Ibrahim (2017), it also has a significant impact on land use by displacing vegetation in favour of residential and commercial areas and associated infrastructure, thereby increasing the LST.

During the day, the temperature differential between urban and rural areas is typically between 3°C to 5°C. At night, however, due to the slow radiation of heat from urban surfaces, the differences can reach as high as 12°C (EPA, 2008).

According to Jusuf (2007), different land uses will almost certainly have a different effect on urban temperature and may contribute to the urban heat island effect if no precautionary measures are taken. Thus, it is critical to incorporate remote sensing data into the study of urban climate in order to obtain the synoptic view necessary to comprehend the interaction between natural processes and their human modification (Stefanov & Brazel, 2007).

Thus, this article discussed the patterns of temperature distribution across Kuching's urbanisation and established a relationship between urbanisation and land surface temperature in the study areas.

STUDY SITE

The study will focus on the central Kuching area, which is located in Kuching North City and is administered by the municipal council, DBKU. Four (4) spatial subsets were chosen for this study due to the diversity of land use types, dense urbanisation, and growing townships in Kuching. These neighbourhoods include Matang Jaya, Satok, Tabuan Jaya, and Batu Kawa. These areas primarily consisted of land uses, such as residential/housing, commercial, and new towns. Population expansion and policy changes boosted demand for space, resulting in rapid urbanization (Wan Ibrahim & Muhamad Ludin, 2016). The effects of urbanisation on the temporal variations of land surface temperature (LST) in the Kuching city area are being evaluated using a remote sensing and geographic information system (GIS) approach between 2005 and 2017. The increased adaptability in modifying digital data has resulted in several strategies for change detection with satellite imagery (Mohd Noor et. al, 2013). Thus, Landsat satellite images were used in this study.

METHODOLOGY

The secondary data for this study comes from Landsat images taken between 2005 and 2017. All satellite images were downloaded from the United States Geological Survey (USGS) using the Global Visualisation Viewer's navigation tools (GloVis). This study used the specific band 6 (thermal band) and band 2-4 (RGB) to identify LST and land coverage. Additional secondary data were obtained from the local government of Kuching, including a cadastral map, municipal boundaries, and master plan map.

The navigation tools used in this research study are most likely remote sensing software, such as Erdas Imagine 14.0 and ENVI 5.0 for image pre-processing and data analysis. Subsequently, ArcGIS 10.1 was used to organise the data and create the maps.

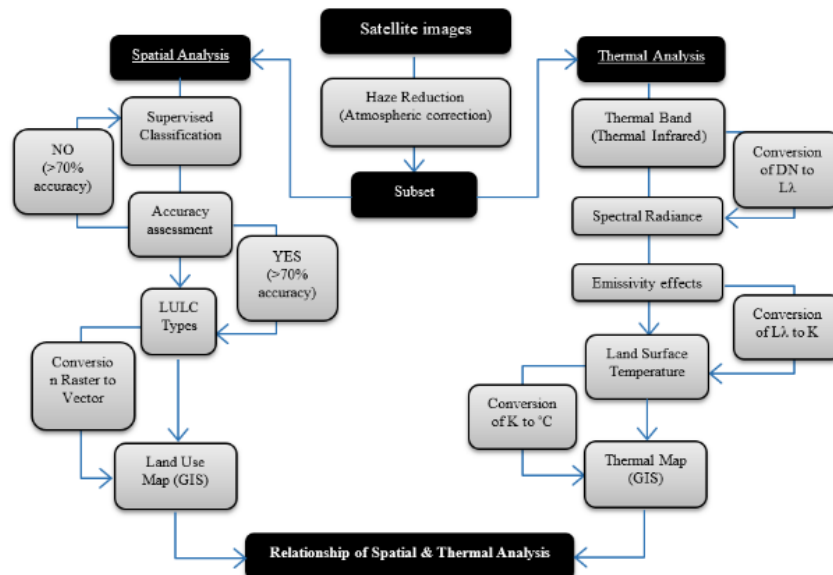


Figure 1: Steps of Data Processing and Analysis

RESULTS AND DISCUSSION

The main output in which the results of the study are being presented include land use map for year 2005 and 2017, land use types temperatures statistics and LST retrieval for case studies.

Kuching Land Use Cover Changes in Year 2005 and 2017

The study area's land use maps were generated in GIS and presented in Figure 2 to show the involvement of those five (5) classes of land cover types, which are urban built-up, green parks, vegetation, bare land, and water body, with different colours for each class including red, light/dark green, yellow, and light blue.

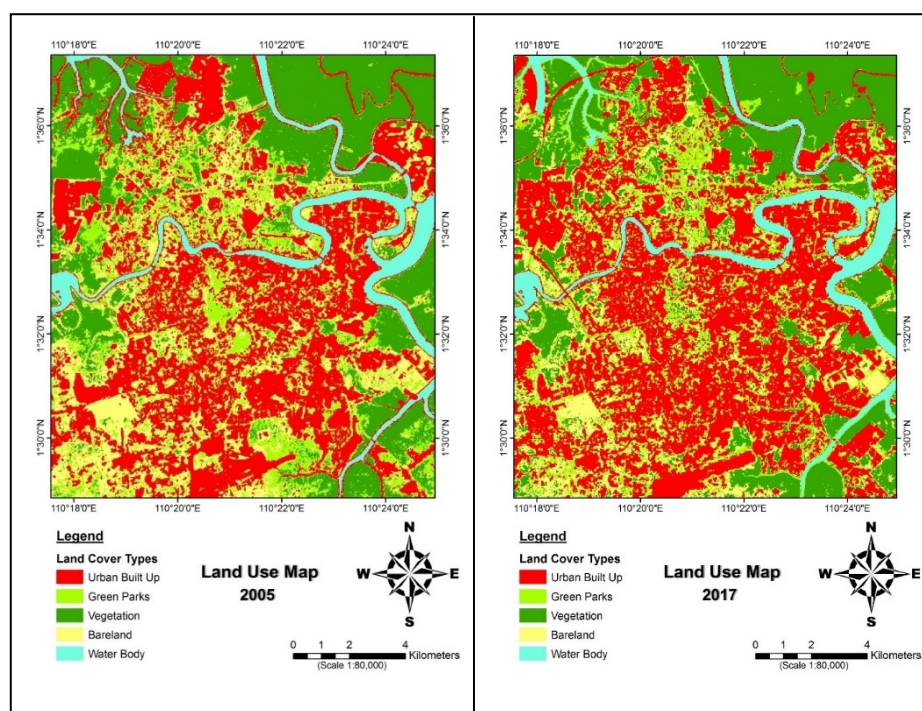


Figure 2. Land Use Map of 2005 and 2017 generated in GIS

There are two trends that can be distinguished from changes in land use/cover. To begin, the urban built-up area and green parks have gradually increased over time, while vegetation and barren land have gradually declined, the water body has remained constant. According to Table 3, urban built-up area increased by 17.1% in 2017 to 1334.4 ha, while green park area increased by 9.6% to 362.7 ha. On the other hand, as development occurs, vegetation areas will undoubtedly be impacted, as they have declined by over 5.1 percent over the last 12 years. Additionally, the results and trends revealed that vegetation was still limited and significant due to certain environmental policies implying that it should not be exploited in comparison to barren land, as the majority of it was clearly dominantly used for development purposes, to cater to the growing urban

population (urban growth). Urban growth as a whole, including gains and losses of class types, totals 73.4 percent. Therefore, for the growing city of Kuching, and as the capital of Sarawak, it is common for the city to imply a dramatic urban growth and changes in the morphology of the city size and extent.

Table 2: Class Growth Statistics in Hectares

Class Types	Year 2005 – 2017	
	Changes (ha)	Class Growth (%)
Urban Built Up	1334.3 (+)	17.14 (+)
Green Parks	362.7 (+)	9.60 (+)
Vegetation	260.6 (-)	5.09 (-)
Barren land	1436.4 (-)	41.58 (-)
Water Body	0.00	0.00
Total (Gain and Losses)		73.41%

Relationship of Urban Growth and Land Surface Temperature

The investigation of each land use type's thermal signature is critical for understanding the relationship between land use and LST. A comparison of land use and LST retrieval was conducted by selecting sampling points for each land use category and spatial subset to compare all LST retrieval. The minimum and maximum temperatures were recorded, and the average of the LST was calculated over two time periods. As a result, Table 3 summarises the overall findings and then delves into the findings for each spatial subset graph and map.

Table 3: Spatial Subsets LST Retrieval

Spatial Subset	2005			2017		
	Min (°C)	Max (°C)	Mean (Σ)	Min (°C)	Max (°C)	Mean (Σ)
Matang Jaya	21.8	26.9	24.3	26.9	30.3	28.6
Satok	21.3	25.9	23.6	24.4	29.8	27.1
Tabuan Jaya	21.3	26.9	24.1	25.4	29.8	27.6
Batu Kawa	19.2	23.8	21.5	24.9	29.8	27.4

Case Study 1: Matang Jaya

The Matang Jaya areas were envisioned as a new township in Kuching, complete with housing (Taman Matang Jaya, Yen Yen), commercial (Emart, Metro City), and educational facilities (SMK Matang Jaya, SK Petra Jaya, SMKA Sheikh Hj Othman Abd Wahab).

Table 3 showing that, between 2005 and 2017, the LST value gradually increased. The LST has undergone significant changes as a result of the growth of Matang Jaya township and the corresponding increase in built-up areas of these areas (refer to Figure 3). From 2005 to 2017, the minimum LST increased from 21.8°C to 26.9°C and the maximum LST increased from 26.9°C to 30.3°C, respectively.

Case Study 2: Satok

Satok areas are those where commercial (Kubah Ria, Wisma Satok) and residential (Star Garden, Happy Garden) land uses predominate, with some provision for Malay settlement (Star Garden, Happy Garden) (Kpg Kudei, Kpg Ajibah Abol).

The results in Table 3 indicate that the LST in Satok areas increased from 21.3°C to 24.4°C (min.) and 25.9°C to 29.8°C (max.) between 2005 and 2017. Satok areas were one of the earliest commercial areas in Kuching and has seen significant changes in land use with the construction of numerous new commercial areas in the surrounding areas (refer to Figure 4).

Case Study 3: Tabuan Jaya

Tabuan Jaya, like Matang Jaya, is a growing new township in Kuching with amenities, such as housing (Tabuan Park, Tabuan Desa, Tabuan Laru), commercial (Viva City, Giant), and education (I-System, Kolej AITC, SK Tabuan), among others.

Based on Table 3, Tabuan Jaya areas obtaining an increase in LST over two-time periods of 21.3°C to 25.4°C (min.) and 26.9°C to 29.8°C (min). (max). Between 2005 and 2017, the mean LST was 24.1°C and 27.6°C, respectively. Meanwhile, similar to Matang Jaya, the LST obtained clearly demonstrates the areas surrounding Kuching, a growing township with changes in land uses in certain areas, particularly in the red color zone areas (refer to Figure 5).

Case Study 4: Batu Kawa

Batu Kawa areas, along with Tabuan Jaya and Matang Jaya, are developing into a new township in Kuching, with the provision of amenities, such as residential or housing (Taman Desa Wira, SkyVilla Residence), commercial (MJC City, Emart Batu Kawa), and educational (SJKC Tapang Hilir, SK RPR Batu Kawa), among others.

Referring to Table 3, Batu Kawa areas retrieved an increment of LST between 19.2°C and 24.9°C (min) and 23.8°C to 29.8°C (max). Batu Kawa was formerly known as MJC City Development's growing township, which offers commercial and residential space. Thus, the LST trends demonstrated significant changes in land use from 2005 to 2017, particularly in the red spot areas (refer to Figure 6).

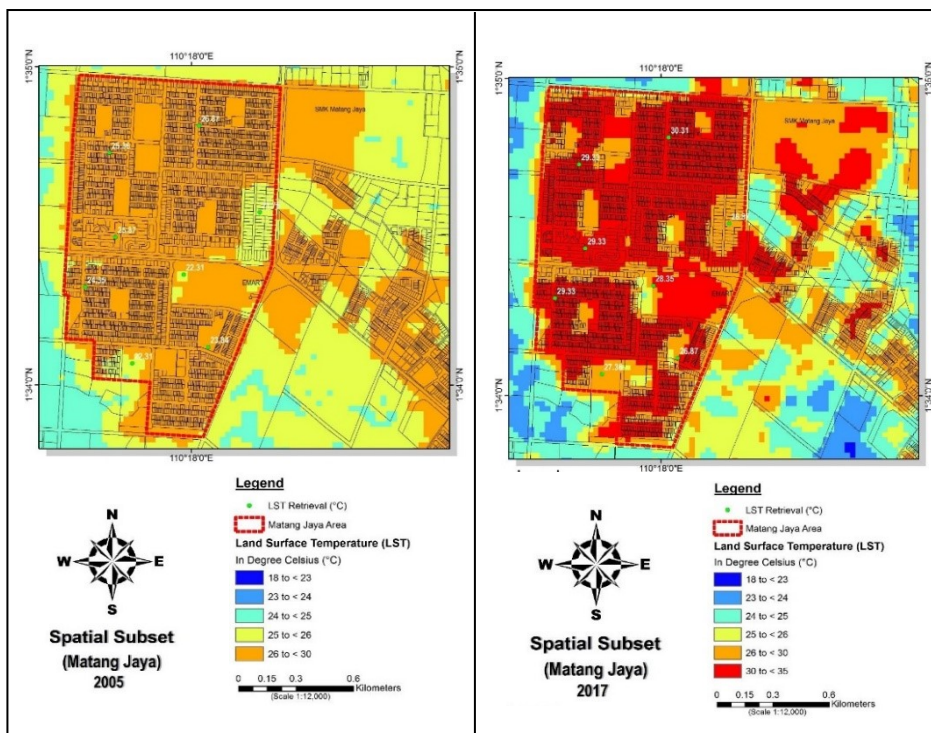


Figure 3: Comparison of LST in Matang Jaya for Year of 2005 and 2017

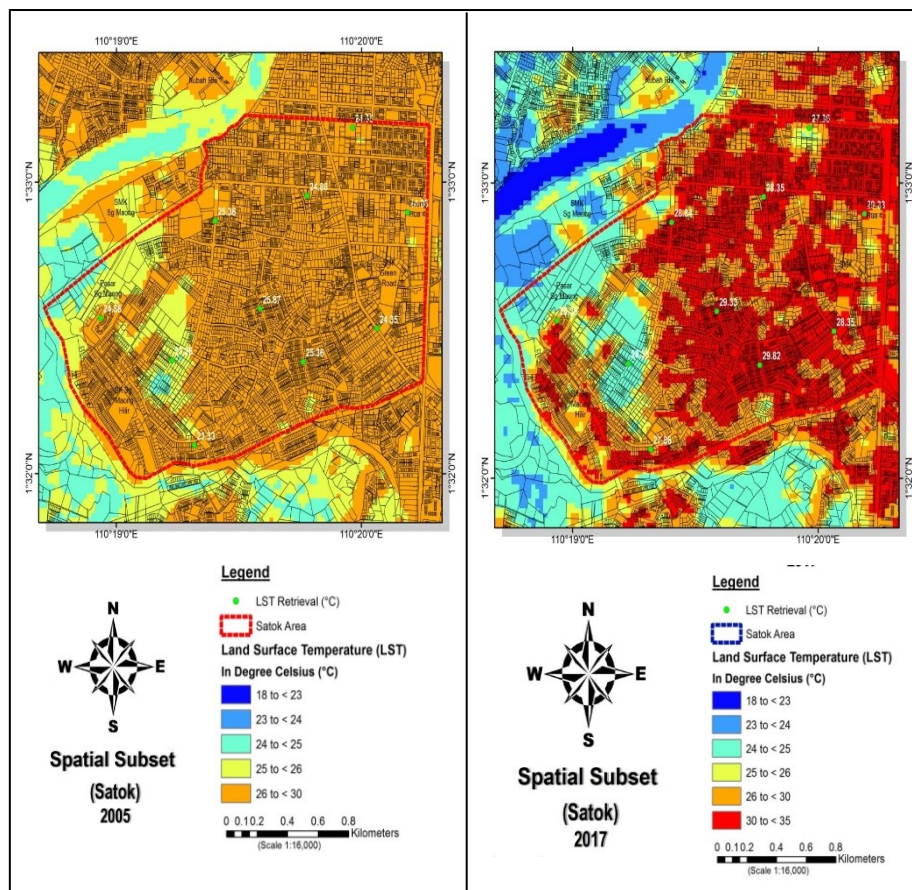


Figure 4: Comparison of LST in Satok for Year of 2005 and 2017

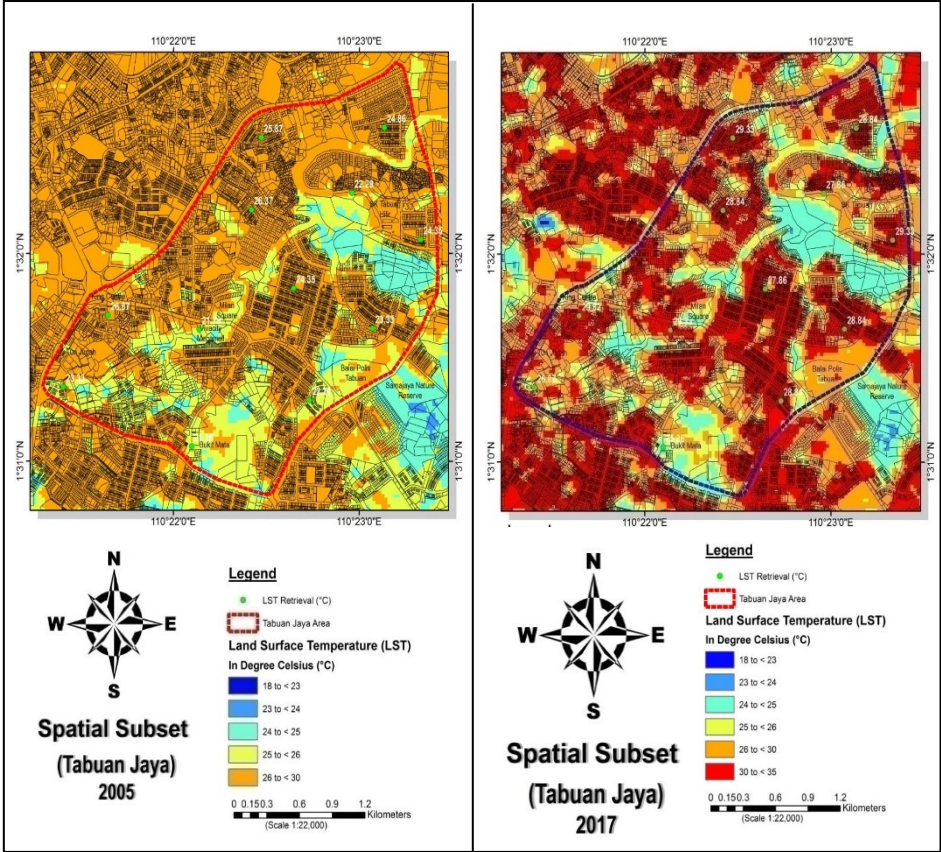


Figure 5: Comparison of LST in Tabuan Jaya for Year of 2005 and 2017

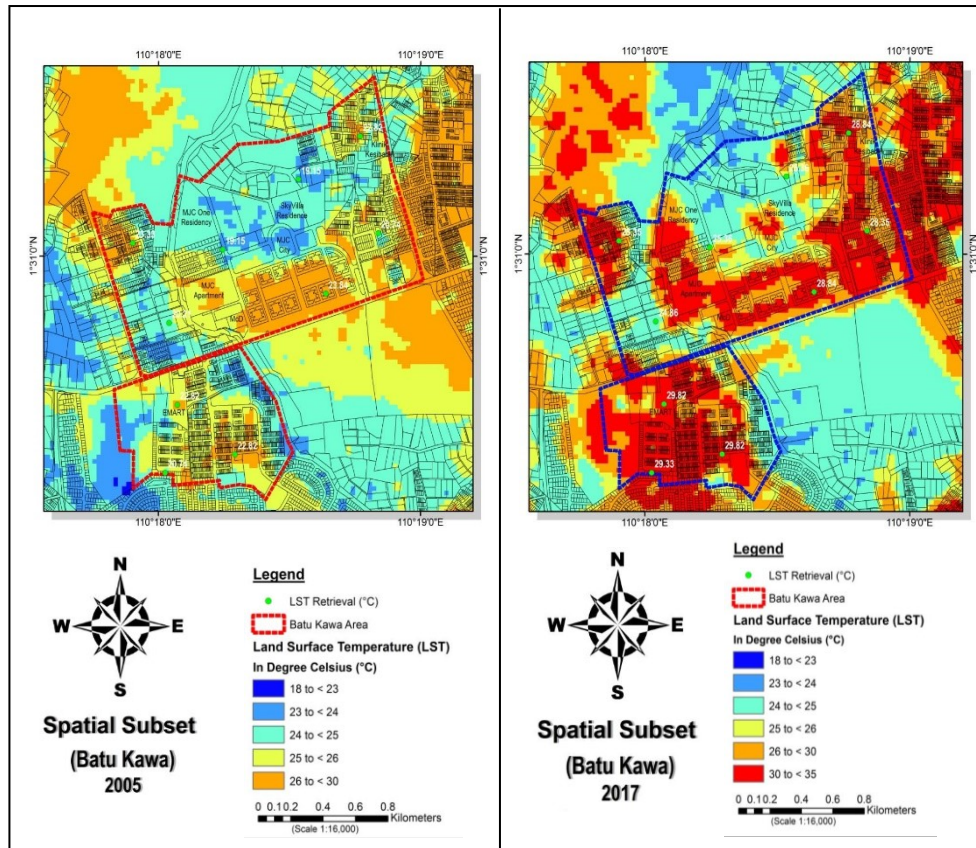


Figure 6: Comparison of LST in Batu Kawa for Year of 2005 and 2017

Discussion

Apart from the LST retrievals from all four (4) spatial subsets, it can be concluded that from 2005 to 2017, the land surface temperature (LST) increased as land use or land cover patterns changed fundamentally as a result of accelerated development and the growing township in Kuching. The growing townships of Matang Jaya, Satok, Tabuan Jaya, and Batu Kawa can be seen as the primary contributor to the noticeable changes in the urban climate in Kuching between 2005 and 2017, as measured by the dominant changes in LST. According to Weng et al. (2007), urbanisation is defined as the conversion of non-agricultural land to uses associated with population and economic growth, which has a significant impact on the urban climate.

By enclosing land with buildings, roads, and other impervious surfaces, urban areas absorb more solar radiation and have a higher thermal capacity and conductivity. As a result, urban areas are likely to have a slightly higher temperature than rural areas due to heat generated by houses, commercial

buildings, transportation, and industry. These have accelerated urbanisation and placed extreme strain on the environment, whether on a local or global scale.

CONCLUSION

This study discovered that the significant reason for the increase in land surface temperature (LST) in Kuching between 2005 and 2017 is due to land use changes. Urbanisation appears to have an effect on land use by displacing vegetation with residential, commercial, industrial, and related infrastructures, thereby increasing the land surface temperature (LST). Apart from that, a more extensive and thorough study is recommended in the future. With regards to environmental concerns, it is recommended that a broader scope of study be conducted in which primary source data from satellite images can be used to create certain indices such as the Normalized Difference Vegetation Index (NDVI), the Normalized Difference Built-up Index (NDBI), the Normalized Difference Bareness Index (NDBAI), and the Normalized Difference Water Index (NDWI). By determining all of the indices, the thermal study becomes more detailed, focusing on specific indices such as vegetation, built-up areas, bareness, and water, and the relationship between all of these variables and land surface temperature.

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A QUALITATIVE CONTENT ANALYSIS OF THE DEVELOPERS' PERSPECTIVES ON DEVELOPMENT CHARGES

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Abstract

The conversion of land, increment of plot ratios or density that increases the land value often comes with a development charge. While the local governments view the development charge as one of their income sources for providing utilities to the society, property developers' communities still contend that the charge surges development uncertainty. Moreover, the existing empirical studies of the implementation of development charges in Malaysia are limited since lack of developers' views regarding this matter. Through semi-structured interviews among the property developers, this paper had explored the property developers' perspectives on the implementation of development charges in Malaysia. Data from the interviews were analysed using content analysis techniques. Findings from the analysis revealed that the effect it has on property developers seems to have increased the developers' uncertainties, especially on the cost of property development. This paper provides new insights for future research in the study of relevant approaches to improve the efficiency of the development charge and the effect it has on the developer's uncertainty.

Keywords: property developer, development charge, qualitative content analysis

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RESEARCH BACKGROUND

The objective of this study was to explore the revolving arguments among property developers pertaining to a development charge imposed on property projects that were carried out in accordance with Section 32 of the Town and Country Planning Act 1976 (Act 172). The development charge was levied on the applicant if the project was approved specifically for land use conversion that changes the compactness, the increment of plot ratios and density that will increase in land value (Abd Rahman et al., 2019). Currently, the property developers are juggling the surge in the cost of doing business. The growing concerns of high imposition rate, increasing development cost, and unstandardized payment procedures are still interspersed after the implementation of the development charge. Moreover, the absence of specific rates of charges and standard methods of calculation on development charges by the local planning authorities have created dissatisfaction among developers. In addition to that, past research on the implementation of development charges in Malaysia is inadequate due to the lack of developers' perspectives concerning this matter. Thus, this study will give an insight into the local authorities on the competency of the development charge and the effect it has on the developer's uncertainty.

Development Charge: Definitions and the Implementation

In the context of development charges, several definitions explain the meaning and how it is used appropriately. Some important words that reflect the implementation as a whole are development charges, development, land use, planning permission, development charges, and rules. This definition is stated under Act 172 and the Development Charge Rules at the state level, as well as a reference to the Dewan Bahasa dan Pustaka Dictionary. The definition of 'development charge' as mentioned in Section 32, Act 172, clarifies the development charge and liability. Besides, if a local plan or a variation of a local plan results in a change in use, density, or floor area in respect of any land, to increase the value of the land, a development charge should be levied in respect of any land development initiated, undertaken, or carried on according to the change. The Development Charge Method also refers to the same definition, which is under the Section 32 of Act 172.

The development charges are usually related to planning actions that cause an increase in land value. Maximizing plot ratios could fulfil the high population (Abd Razak & Yin, 2021). In the context of planning theory, development charges are required when the authorities carry out a land-use conversion on a particular area. The charge is imposed when there are basic changes in planning such as land use zone change, increase in density, and

increase in plot ratio, however, the effect of the planning action has proven that there is an increase in land value to be charged (City Planning Department, 2019).

Several countries also implement development charges. According to Crawford & Juergensmeyer (2017), the implementation of development charges is a popular concept among countries in reducing the burden of local governments providing facilities as a result of the municipal process. In Singapore, the law for the payment of development charges has been used since 1965. However, the development charges were first introduced in 1980 through the Planning Act (Chapter 232, Section 40), Planning (Development Charges) Law Revised 2007 Edition. Meanwhile, in the United States (US), the source of private income is from the “development impact fees (DIF)” translated as development impact costs. The changes in the US have shifted from public policy to land use and the provision of infrastructure as enshrined in the Mitigation Fees Act (Brunson 2020).

In general, the development charges are a way to shift the expense of additional infrastructure to the developers because of the changes in development plans that result in a larger development. The development charges have become an increasingly popular option among local authorities because they can hand over the fees directly to the developers instead of providing direct costs to residents, as in the case with property taxes. In the previous research by Abd Rahman et al. (2019), there are five (5) main concerns after the implementation of the development charge namely, duration, the collection of data, individual application, payment method, and unstandardized rate. The unstandardized rates charged can be summarised as in Table 1.

Table 1: Percentage of Development Charge Rate

Types of municipalities	States				
	Selangor	Perak	Kelantan	Kedah	Johor
City hall	30 %	10 %	-	20 %	25 %
Municipal	30 %	10 %	15 %	20 %	15 %
District	20 %	10 %	10 %	20 %	10 %
International Zone	-	-	-	-	30 %

Source: Federal Department of Town and Country Planning (PLANMalaysia)

The development charge method also stipulates that the local planning authority should ensure that a local plan for its area has been gazetted and contain information on proposed land use, density, or plot ratios. The rate of charge is as prescribed by the State Authority (PBN), and gazetted in the development charge method of the states that implemented this charge. Each state uses different rates

according to the current scenario and their respective needs. However, most states set the rate classification according to the status of the local authority in their respective states to create uniformity and capability, as well as the development potential in the local authority area. The calculation method or basic formula for the calculation of development charges is as follows:

$$R \% * x \text{ difference in land value } **$$

* the percentage rate depends on the PBN ruling

**differences in land values are due to changes in land use categories, changes in density or density, and changes in floor area

In the Malaysia scenario, the development charge imposition is high. Hence, many developers or applicants show protest and appeal for a lower rate. McAllister et al. (2018) suggested that the local governments review the charge imposed conferring to the applicant's category, whether the applicant is an individual or developer. This is to prevent the applicants from cancelling their application, which may later cause a loss of income to the local government. With a high development charge, the development costs might increase which may result in the increase of end buyers (Smith & Teitz, 2020). This is because the development charge is also a part of total development costs. The increase in the development costs will increase the selling price of the development, thus, will reduce the demand for that particular development (Jones, 2015).

METHODOLOGY

This study applied qualitative content analysis to obtain robust descriptions of property developers' perspectives and experiences regarding the implementation of development charges in Malaysia. Data was gathered through an in-depth semi-structured interview. The key to having a conversation with experts is to gain an in-depth understanding of the matters to be studied (Berner-Rodoreda, et al., 2018). The characteristics of a semi-structured interview are it is focused on the respondents' experiences regarding the research topic, and it takes place with respondents known to have been involved in a particular experience (Mansor & Sheau-Ting, 2021).

Semi-Structured Interview

The semi-structured interviews were conducted virtually, and the recorded sessions were saved in Google Drive. Each session lasted for approximately 20 to 40 minutes. As this study espoused a semi-structured interview, an interview guide is essential to assist the researcher to achieve the research objective (Brinkmann & Kvale, 2015). The questions used for the interview guide during

the virtual interview sessions were relevant to the implementation of the development charge in Malaysia. The perspectives, experiences, and differences in answers among the property developers were explored. Other questions which were not included in this guide are considered additional.

Table 2: Interview Guide

Procedures	Questions guide
Introductory question	Would you please describe your professional background and experiences in the property development sector?
Focus questions	In your opinion, is development charge a mechanism used to encourage developers in land development, or is it a penalty to increase the local authority's source of funds? Are there any other concerns you find lacking or in need of revision?
Concluding question	Is there anything else that you feel that we should have talked about but did not?

Source: Authors' Research, 2021

This guide aimed to achieve the research objective, which only serves to gauge the property developers' perspectives regarding the implementation of development charges in Malaysia.

Methods of Sampling

The respondents for this study were sampled by using the purposive sampling technique. Purposive sampling is used when a difficult-to-reach population needs to be measured and the key to allow the respondents to provide ample and justifiable feedback (Pandey & Pandey, 2015). Respondents were selected based on their wide range of experience in property development. Table 3 displays the characteristics of respondents.

Table 3: Characteristics of Respondents

No.	Experience	Main Area
N1	More than 10 years	Property development and construction
N2	More than 10 years	Property development and construction
N3	More than 10 years	Property development and construction
N4	More than 10 years	Property development and construction
N5	More than 10 years	Property development and construction
N6	More than 10 years	Property development and construction
N7	More than 10 years	Property development and property investment
N8	More than 10 years	Property development and construction
N9	More than 10 years	Property development and construction
N10	More than 10 years	Property development and construction

No.	Experience	Main Area
N11	More than 10 years	Property development and construction
N12	6 – 10 years	Property development and property management
N13	More than 10 years	Property development and construction

Source: Authors' Research, 2021

Data Analysis

In analysing the interviews data, Brinkmann and Kvale (2015) distinguished five processes for qualitative content analysis. The first stage begins with interview sessions, involving an invitation; obtaining consent, setting up the virtual meeting space, conducting interviews and recording. Next, information generation and after that is transcribing the generated information into an electronic format. Then, during the data transcription, their responses were coded by determining keywords and phrases commonly used amongst the participants that involved indexing, highlighting, and sorting out quotes and rearranging them to develop thematic content (Creswell, 2018).

During the transcription process, the phrases and keywords were analysed and encoded with suitable category labels and afterwards, the concerns or impediments were formed (Saraf et al., 2019). Finally, it is the interpretation of the findings. These new emergent findings were narrated to relate to the implications of the research. As it builds directly from the raw data, the process itself ensures the work's validity (Bryman, 2012). Figure 1 displays the interview procedures and analysis.

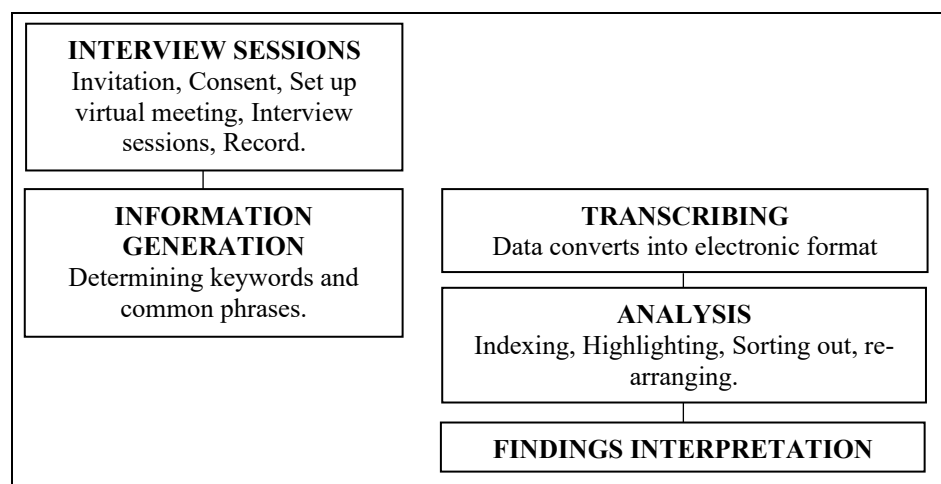


Figure 1: Interview Procedures
 Source: Brinkmann & Kvale, 2015

Rigour and Reliability in Qualitative Data Analysis

In the analysis stage of qualitative data, three strategies were used to ensure the rigour of data analysis namely credibility, confirmability and accuracy (Othman et al., 2020). The reliability of the qualitative content analysis was achieved as transcribed data was cross-checked with the transcripts while indexing, highlighting, sorting out and re-arranging the data several times to ensure accuracy.

RESULTS

This section presents the findings of qualitative research, probing the property of developers' perspectives in the implementation of development charges in Malaysia. Thirteen property developers were interviewed and the abstracted data were categorised into five main categories as presented in Table 4. The categories were described with quotes from the participants.

Table 4: Abstraction analysis

Categories	Descriptions
Source of fund	Increase funds, a penalty
Rates imposition	High tax rates, unstandardized rates
Payment consideration	Duration of payment, appeal concern

Source: Authors' Research, 2021

Category 1: Source of Fund

From the content analysis, regarding the first interview question, six of the interviewees claimed that the development charge is one of the ways to increase the local authority's source of funds.

'It is a mechanism used to encourage developers in land development, but it should not be high.' N1

'...one of the ways to increase the source of funding.' N2, N3

'Development charge appears to be a source of funds to local authorities.' N6

'One of the ways used by the local authority to spur the development of land with potential value [translated].' N9

'Local authorities can expand their sources of income.' N13

To add on, four interviewees disagreed that the development charge encourages land development, instead, they said that it was a penalty to the developers.

'It is definitely a PENALTY to increase the local authority's source of funds.' N4

'The development charge is a fine to increase the income of the local authority.' N7

'...it (the charge) is not to encourage land development as it has become an additional burden to developers.' N10

'The implementation of this development charge is only beneficial to one party only (the local authority). While the other side (applicant) had to bear the loss.' N11

Category 2: Rates Imposition

Furthermore, one of the main concerns of the interviewees was related to the high imposition of rates by the local authority. The charge is generally high and often burdens the developers.

'The current (rate) is too high and the charges are different from one council to another.' N2

'(Nevertheless) when we commit to the state government that we are building whole affordable housing, and appeal to local authorities for a lower rate of a development charge, it is not entertained by them.' N8

'...it (the imposition rate) should not be unreasonable (high).' N1

'The rate imposed was excessive. (Nevertheless) when we commit to the state government that we are building whole affordable housing, and appeal to local authorities for a lower rate of a development charge, it is not entertained by them.' N6

'...the charges are very high.' N12

'...the rate of Development Charges should be lowered.' N13

Another highlight was the demand for an urgent review to lower or abolish unnecessary charges that have a direct impact on the cost of property development.

'Local authorities have to take consideration of the type of house, whether it is the high-end product or affordable housing. Besides, open for discussion when we submit a valuation report to the local authority.' N6

'For any developer who wants to develop affordable housing and below (low-cost housing), the Development Charge ought to be reviewed to be reduced or waived.' N9

'.... request a review of the development charges imposed on the developer, this has indirectly caused the sale price of the house to increase significantly.' N11

'Development Charges could be waived, provided that the developer needs to develop one large-scale development or affordable housing. With this exception, to some extent can reduce the development costs borne by developers who do not get a high profit from the sale of affordable housing. This makes the local authority and the developer in the same situation - both wins.' N13

From the content analysis, the concern also underlined the unstandardized rate levied for land use conversion. The levy of development charge is different from one local authority to another local authority, this leads to objection and appeal and eventually, it prolongs the payment process of development charge.

'Not standardised and different states imposed different requirements.' N1

'There is by right a standard rate to follow but council seems to ignore this and comes out with their own formula. Which apparently also cannot be revealed to developers as to how they derive the formula or come to final numbers.' N2

'Rates should be fixed. High development upfront payment deters developments.' N4

Category 3: Payment Consideration

Providing a different dispute, one of the respondents stated that the duration of the development charge should be extended until the issuance of Certificate Completion and Compliance (CCC). Furthermore, several respondents claimed that the appeal system to lower the rate of development charge was not efficient, as the local authorities did not entertain such appeals.

'...the duration of payment should be given until just before CCC is issued.' N2

'...payment should be collected upon CCC rather than before planning approval.' N4

'...we did appeal to the local authority for a lower rate of development charge; (hitherto) it was not entertained by them.' N6

DISCUSSION AND CONCLUSION

Based on the findings discussed in this study, this section concludes the developers' perspectives on the implementation of development charges in Malaysia. There are two main highlights from the findings: firstly, property developers alleged that the development charge is a penalty given to developers to escalate the local authorities' source of funds because the imposed rate was unreasonably high. Nevertheless, the development charge is a solution to find alternatives to shift the cost burden of new infrastructure to developers because of changes in development plans that increase the size of the development.

Secondly, the property developers demand an urgent review to lower the development charges. They argued that the appeal system to lower the rate of development charge was not efficient, as the local authorities paid no attention to such requests. Concerning these matters, the developer should be aware that the payment of development charge imposition under Act 172 (Section 33). The Act states that the amount determined by the planning officer is final without the appealing procedure. Furthermore, Section 34 of the same Act requires the payment must be in full, not partially.

Policy Recommendations

This paper recommends two propositions for future research in the study of relevant approaches to improve the efficiency of the development charge and the effect it has on the developer's uncertainty. Firstly, a town hall meeting session involving the related parties in the post-development charge should be a priority to address issues from different perspectives. For further research, it is suggested that a study to be performed to propose a holistic work procedure that is

technically efficient and legally permissible based on the findings from developers' perspectives.

Secondly, the need to revisit Section 33 and Section 34 of Act 172. Consequently, the effect it has on property developers was the intensification of developers' concern of the increase in total property development cost. Moreover, the contentious issue concerning how the development charge affects the availability and affordability of housing mainly surrounds the use of development charges, as developers increase the house price. Some local authorities have increased the development charges fee that has affected the total cost of development. In addition, the developers have no choice but to opt for the necessary changes to muddle through the increase in development cost input. Therefore, with a revision, a decent procedure will guarantee full cooperation with the applicant, thus, will make the duration of the planning approval and payment of the development charge to become efficient.

Study Limitations

This study has some limitations and would not draw a biased conclusion. Firstly, it is expected that the developer's perspective on the implementation of the development charge may not be representative of the study context. The findings could be affected by gender, designations, APDL class category (Advertising Permit and Developer's License) and economic status. Secondly, the study used purposive random sampling of developers' views using an interview guide, which probably could not reflect different views using other research methods such as quantitative.

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AN IMPROVEMENT OF INTEGRATED GEOGRAPHICAL INFORMATION SYSTEM IN MANAGING SEWERAGE TREATMENT PLANT

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Abstract

In Malaysia, the Geographical Information System (GIS) is widely used by various organizations in both government and private sectors because of its various capabilities. The rapid development process in the large city in Peninsular Malaysia and new area has caused an increasing number of the sewerage treatment plant (STP) maintained by Indah Water Konsortium Sdn Bhd (IWK) every year. Nowadays, with the big services areas and limited staffs the IWK had faced many issues related to the sewerage such as a public complaint on blockage, overflow and others. Thus, based on the powerful function of this GIS, the IWK also has used the GIS application known as Integrated Geographical Information System (IGIS) in their daily routine works. However, due to the weaknesses of this existing system, it cannot be optimally utilized in managing and maintaining the sewerage system more efficient. The main objective of this research focuses on analyzing user requirements to improve IGIS based on the current issues faced by them. The method used in this study is qualitative method using a face-to-face interview with IGIS users in getting any feedback from them on the existing data with an examining what is the main attribute data required. Then a content analysis was used to analyze it by updating all the data required and removing unnecessary data from the IGIS. As a result, the newly updated attribute data into IGIS will help the users to conduct proper planning in controlling the increasing number of STP every year and to manage the sewerage system more efficiently.

Keywords: Geographical Information System, Sewerage Treatment Plant, Decision Making Process, Facilities Management

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INTRODUCTION

Nowadays, there are many new development areas that had grown in the major cities in Malaysia because of the increasing number of demands in property especially the residential and commercial sector. The sewerage treatment plant (STP) facility is one of the important amenities that need to be provided by the developer in order to ensure well-being and comfort for the property buyers and that were also stated in related gazetted guidelines. Established on the 2nd of April 1994, the Indah Water Konsortium Sdn Bhd (IWK) had been appointed by the Malaysia government to manage, operate and maintain a sewerage system nationwide. Before this sewerage company was established, the sewerage system was previously managed by a local authority (LA) in every district of state in Malaysia. IWK took over this service from the LA in the year 1994 as part of a concession agreement with the federal government that does not include the state of Kelantan, Sabah, Sarawak, Majlis Bandaraya Johor Bahru and Majlis Perbandaran Pasir Gudang (The Malaysia Reserve, March 28, 2019). The existence of the new development areas had caused an increasing number of the STP and public sewerage sewer line (SPPA) that needs to be maintained and operated by IWK every year. As of March 2021, the total number of STP's maintained by IWK is 11,857 in Peninsular Malaysia including 102 LAs with total length of sewer line of 20,623 kilometres (IWK, March 2021). Thus, this increasing number of STP's and sewer line shows that IWK needs to spend extra cost for their operation and maintenance works (Kumpulan Media Karangkraf, 2018). With the low tariff that had been charged to their customers, IWK is constantly seeing a loss in their profit since being established in the year 1994 (Berita Harian, 2012).

The recent advances in information technology (IT) have made the Geographical Information System (GIS) in this country to become the most popular application and it has been actively used by many government departments and agencies including the private sector, due to its various capabilities. The various capabilities of this GIS include its ability to store and manage data and information that helps the users in decision-making especially in planning and the development stage, which is also capable to act as a management platform (DeMers, 2005). Throughout the years, IWK has faced many issues such as in identifying the critical SPPA, an illegal connection from the industrial and commercial areas, the river pollution at the nearest STP, the squatter problem on the STP land, and amongst other issues. Therefore, in order to ensure the smooth process in their daily work, and to facilitate access to information needed, IWK had developed a GIS application known as Integrated Geographical Information System (IGIS). Currently, by using this IGIS, the users can view the location of STP and SPPA on the ground through their computer desktop in the office.

The aim of this paper is to look on how the improvement of existing IGIS can be used for the purpose of managing and controlling the increasing number of new STP. Besides that, it also to look into what is the effectiveness of this IGIS

improvements whether it can help the IWK to solve their current issues and problems.

PROBLEM STATEMENT

The GIS application had been used in IWK for more than 10 years and it is proven to help the Planning and Land Section (PLS) during the planning stage especially in controlling the increasing number of the STP every year. However, there are some weaknesses in this existing IGIS that needs to be improved from time to time because it cannot be optimally utilized in managing and maintaining the sewerage system. The main weakness of this existing IGIS is the lack of relevant information that need to be updated in the IGIS. The increasing number for STP has created many problems to IWK, particularly in the following departments or sections:

Operation and Maintenance Department (OMD)

The increasing number of STP and SPPA took over by IWK every year had seen the OMD faced a lot of problems in their daily work. Whilst covering such big area for maintenance and limited number of staffs, the operation and maintenance work for STP and SPPA is very difficult to be done properly. The major challenges in maintaining the SPPA faced by the OMD, are the issues of blockage and overflow. These two issues are the frequent complaints received by the OMD from the public. It can easily be caused by a mere act of an irresponsible person dumping a solid waste into a toilet bowl, which happens due to the lack of awareness among the public about sanitation. Other issues faced by OMD are conducting a maintenance work for all unused or rationalized STP. Based on the database for the month of March 2021, there are 732 STP sites that had been rationalized nationwide (IWK, March 2021). IWK had received a lot of complaints from the public for unused or rationalized STP such as odor and breeding of mosquitoes area. Based on a local news report in year 2018, complaints were made by 1,000 residents of Tman Seri Marina Phase 1 in Kuala Kedah on the daily stench smell coming from the five-year-old idle STP (Utusan Malaysia, December 11, 2018). The STP is very synonymous with IWK as the national sewerage company, though this former sewerage site was handed over to the Sewerage Services Department (JPP) officially on the 1st of January 2016 for maintenance works that includes to demolish the structure, security and others. Indirectly, these issues has resulted in a bad reputation towards the IWK image for unused or rationalized STP due to poor maintenance.

Planning and Land Section (PLS)

Currently, the GIS unit under PLS faces the biggest challenge in updating related information on new STP and SPPA in IGIS. The main problem is significantly caused by outstanding received documentation from related Certifying Agency unit (CA). This causes the delay in updating and capturing the latest information,

especially in identifying the connection points between existing STP or SPPA and those in new development, into IGIS. Thus, the information stated in IGIS is not up to date. In current practice, the property developers will liaise with the GIS Executive (GE) and Asset Executive (AE) in procuring any related information on STP or SPPA before submitting the form of Planning Approval (PDC1) to CA for approval. For the example, any wrong information on STP that is provided to the property developers, it will cause to an overloaded issues that will also affect the operational works such as breakdown or failure of the mechanical equipment. Thus, the updated information for STP is crucial to avoid these problems from reoccurring in the future. This study has learnt that due to the poor updating conducts, few cases were reported on existing sewer line that was not updated into IGIS due to outstanding documentation, as well as feedbacks from property developers on cases that has on-site existing developments but were not updated in GIS.

As a non-profit company, PLS have taken many initiatives to reduce the increasing number of STP every year by advising the property developers to upgrade existing STP into new design PE or to connect new development to the nearest existing STP. One of the major challenges faced by Planning Engineer (EP) in giving their comment towards upgrading STP is that the information on sewerage land is not completely captured in IGIS. According to the MSIG guideline, to upgrade the old design PE of STP to a new design, it needs to follow the requirements of land area that had been stated. Currently, the IGIS only captures the location of the sewerage land. Thus, the integration of information and documentation such as Certified Plan (CP) into the IGIS and land database system is seen as crucial to facilitate access to sewerage land information.

Customer, Billing and Collection Department (CBCD)

CBCD is one of the departments in IWK that is in-charge of all matters related to customers, billings, and collection of payment of IWK bills. With an increasing number of STP took over by IWK every year, it means the collected amount will be increased. Currently, IWK sends their sewerage bill to the customers every six months and the minimum charge is RM2 per month for the low-cost housing. Unfortunately, the collection of payment for sewerage bills is very low, mainly as a result on the level of awareness among the public to pay their sewerage bills is very poor. CBCD had taken an initiative to overcome this issue by collaborating with PLS in identifying the unpaid customers using IGIS. This program led by PLS is called the 'Non-Revenue Customers (NRC)'. The unpaid customer list will be provided by CBCD based on their billing records and PLS need to recheck the existing information in IGIS such as the address of the premises. However, this initiative is not 100% successful because of the customer database in CBCD system is not tally with IGIS database due to an outstanding issue. Another objective of

this NRC is to focus on the customers who have received IWK services, but the information on these customers is not captured in the billing database.

Finance Department (FD)

An accretion number of STP sees the cost of operation and maintenance incurred by IWK increases every year. This increasing number of STP with the lower sewerage tariff charged to the customers, seeing too difficult for IWK to cover up the increasing cost of operation and maintenance every year. In present time, IWK charges a household at an average of RM8 per month for their sewerage services despite the actual operating cost incurred by IWK that is between RM18 to RM20 (MStar, October 17, 2016). In addition, the IWK also needs to incur the cost of refurbishment works of STP, the problematic STP such as a structural defect and others.

Thus, based on the problems faced by IWK, it is seen as an urge to improve the IGIS application process. However, before any improvements can be made, it is necessary to review and study this existing system in terms of its capabilities and existing data (Maguire and Bevan, 2002). It is also necessary to review the user requirements to ensure that the output can help the IGIS application to function more effectively, for the purpose of managing the STP and SPPA. This paper reports on the use of the user requirements analysis for the purpose of identifying data, it needs to be based on the roles and functions of each stakeholder involved in the PLS, OMD and CA, to ensure the maintenance and management of STP and SPPA to be more efficient.

METHODOLOGY OF RESEARCH

A requirement is defined as a statement that identifies a necessary attribute, capability, characteristic or quality of a system in order for it to have a value and utility to a user (Young RR, 2001, T. Yue et.al, 2010). A successful system and product begin with an understanding of the needs and requirements of the users (Maguire and Bevan, 2002). Thus, the benefits getting from a successful system can help the organization to increase its productivity, to improve the satisfaction of the users, a reduction in support and training costs, and to enhance work quality.

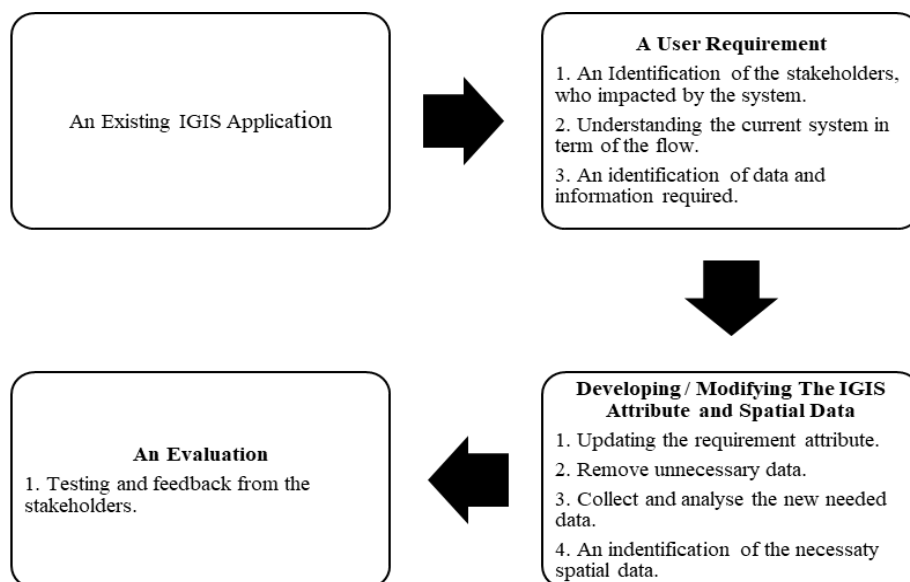


Figure 1: Study Approach

Figure 1 has shown the approach that has been used in this study. It starts with reviewing an existing IGIS of its spatial data, attribute data, functionality, and current capabilities. In terms of a user requirement, the IGIS users were identified, including their current scope related to this IGIS. Currently, there have 3 departments in IWK used this IGIS and it is PLS, OMD and CA. The qualitative method using a face-to-face interview with the IGIS users is the main method used in this study. Total number of IGIS respondents that had been selected and interview is 50 people and all of them is from these 3 departments. During a face-to-face interview, all the respondents were questioned in regards to determining the required or necessary spatial and attribute data that is related to their department (Henry and Charles, 2015). It is for the purpose of ascertaining the extent to which additional spatial and attribute data can be used by them in making a decision in managing and maintaining the STP and SPPA. The interview sessions were also able to collect feedbacks from IGIS respondents in regards to removing unnecessary spatial and attribute data from the IGIS. Then a content analysis has been used to analyze and collect the data needed into IGIS (Henry and Charles, 2015). It is done by updating the necessary spatial and attribute data by removing an unnecessary data from the IGIS. Finally, an additional data and functionality developed within the enhanced IGIS was demonstrated to the IGIS respondents from PLS, OMD and CA to obtain their feedback.

Table 1 shows the example of additional and removing attribute data for the enhanced IGIS and the results obtained are discussed in the next section of this paper.

Table 1: Summary of Improvement Attribute Data in New IGIS Application

No.	Spatial Data	Attribute Data (Added)	Attribute Data (Removed)	Description
1.	Sewerage Treatment Plant (STP)		Object ID	Unnecessary data
			Category	Unnecessary data
		Street Name		
2.	Sewer Line		Sewer Statistic	Unnecessary data
			Volume	Unnecessary data
		Sewer Line ID		
		Fail Reference		
		Complaint No		
		Complaint Date		
		Status of Complaint		
3.	PE Verification Report (PEV)	Fail Reference		
		Asset Number		
		Design PE		
		Street Name		
		Lot Number		
		PEV Date		
4.	Planning Approval (PDC1)	Fail Reference		
		Developer Name		
		Project Title		

RESULT AND DISCUSSION

The Summary of Questionnaire Results

The result of the interview with the IGIS respondents shows that all of the respondents requested on updating the necessary spatial and attribute data, such as PEV, PDC1, as well as removing unnecessary attribute data from the IGIS. IGIS respondents were selected from the PLS, OMD and CA who are directly involved with this application. The total number of IGIS respondents that was interview is 50 practitioners with 21 questions. After that, this attribute data was analyzed using a content analysis and a questionnaire form has been distributed to the all IGIS

respondents in getting their feedbacks on the new capabilities of IGIS. The findings shows that, 100% of the respondents agree with this new improvement of the IGIS and is summarized in Table 2 below.

Table 2: Summary of Questionnaire Result

No.	Description	Agreed (%)	Strongly Agreed (%)
1.	<u>Planning Purpose</u> The result of the analysis obtained to be used in planning works.	88.0	12.0
2.	<u>Purpose of Study Area Profile</u> The result of the analysis obtained to identify the profile of the study area.	95.0	5.0
3.	<u>Cost Saving Purpose</u> The result of the analysis obtained to be used in reducing the company expenses.	76.0	24.0

The New Capabilities of IGIS Application

This section will discuss the result from the enhanced IGIS after the required spatial data were added and unnecessary attribute data were removed from the IGIS. From the results of the questionnaire, all the IGIS respondents agreed with this new capability of IGIS and they are opined it will help them in daily works, especially in managing the sewerage facilities and to control the increasing number of STP. The new capabilities of the enhanced IGIS are stated as below:

An Analysis for Nearest Location of STP or NPS

During an interview with the IGIS respondents, they are requesting the spatial data for PDC1, the information of land such as land area, land owner, lot number, title number and others to be added into IGIS. The result shows with this new spatial data, it can easily assist the GIS unit in searching the location of new development areas proposed by the property developers (Henry and Charles, 2015). Now, the IGIS user can also search the location using a lot number, then the result will display the nearest STP or NPS from the proposed development areas. An updated information of PDC1 into IGIS sees can avoid backloading issues because the information provided to the property developers is up to date, and can indirectly avoid the STP or NPS upgraded more than one time due to wrong information given. As what is currently happening due to the delayed captured information in PDC1. With this new enhanced IGIS, it is requested the GIS unit to update a PDC1 information when received the application from the property developer. This new IGIS capabilities is seen to be able to help the EP in giving their advice to the property developer either to upgrade the existing STP with the new design PE or to build a new STP. If one STP is planned to be upgraded, all the PE for PDC1 that is

connected to it need to be captured and it must meet the requirement of land area as stated in Malaysia Sewerage Industries Guideline (MSIG). As a result, through this analysis, it can assist the PLS to control the unnecessary increasing number of STP or NPS.

An Analysis for Nearest Sewer Line Location

IGIS respondents are requested to add the spatial data for private STP and Individual Septic Tank (IST) into this IGIS. This new spatial data is seen to be very useful to the IWK for property connection program (Mehari, 2009). Using this IGIS, all the updated locations for the private STP and IST will show on the computer desktop. Based on this information, the EP can easily view and propose all potential premises to be connected to the nearest sewer line before it is connected to the Regional Sewerage Treatment Plant (RSTP). Through this property connection program, indirectly it can help the IWK to create another income. The improvement of attribute data for the sewer line information is also expected to help contractors in excavation work that requires information on manhole depth (Mohd Azrai and Lee, 2002)

Planning Analysis for RSTP Proposal

Another analysis can be performed using this new IGIS, it can help the PLS in doing a proper planning in their proposal to build a new RSTP in the future (Ruchin et.al, 2019). It is because all the spatial data for the PDC1, private STP and IST have been updated in this IGIS. With the new capabilities of 'Google Earth', these two applications can be linked each other. Thus, with the satellite image it can help the EP in getting the clear depiction on the ground. It also can help the EP to select suitable location for the new proposed RSTP and to choose the potential STP or NPS to be rationalized (P. Neeraja and Rajesh, 2017). An updated land information in IGIS will improve the IWK's ability to recognize the land owner in the land acquisition process. Based on the information on land size, IWK also can give an estimation of land acquisition cost to the JPP (P. Neeraja and Rajesh, 2017). The budget for this new RSTP is usually allocated by the federal government through the JPP. Thus, with this effort, the IWK can reduce the increasing number of STP as well as their operation and maintenance cost.

An Analysis for Rationalization Program

A program called 'Rationalization Program' is one of the initiatives taken by OMD in reducing the cost of operation and maintenance. Under this program, the small and unprofitable STP will be selected to be rationalized and all the incoming flow will connect to the nearest STP or NPS (K. Deepa, et.al, 2012). The selected STP or NPS to cater the incoming flow from the rationalized STP or NPS normally has a bigger design PE and the meaning of unprofitable STP is the operational and maintenance cost bigger than the billing collection.

An Analysis for the Public Complaint

There are a few attribute data for the sewer line information were added into IGIS, and it is a sewer line ID, complaint number, the date of the complaint, the status of the complaint and others. Currently, the IGIS users in OMD will update all the information related to the sewer line through online based on their day to day works. Normally, OMD has received the complaint from the public about the issues of an overflow, blockage and missing manhole. Using this IGIS, OMD can give a fast response to the complainant after receiving the complaint report from the customer services. Based on the report received, the IGIS users in OMD will assist the team in providing all the related information before going to the site. Previously, the OMD has faced the problem in getting the related information and need an extra time to find the related as-built drawing as well as the trouble in determining the exact on ground location. This new improvement of IGIS is expected to improve the OMD's smooth workflow process in fulfilling their responsibilities. Besides that, the improved IGIS should be able to improve the IWK's image by reducing the number of public complaints with its capabilities that is able to perform analysis on the arising problems public complaints. From the analysis result, OMD can do a proper planning and improve their decision-making, simultaneously avoiding future problems.

An Analysis for the Illegal Discharge

An illegal discharge is one of the major issues faced by IWK every year. Based on the site investigation, the premises such as the food court always discharge their sewage to the nearest SPPA (Jiang B., 2007). There are a few cases that IWK has received summons from the Department of Environment (DOE) due to failure of the sampling results on the compliance standard monitor by DOE. Besides that, the IWK also has spent a hundred thousand ringgit to replace the breakdown equipment. With this new IGIS, the spatial data for the PEV were added and the result of PEV will be updated. Thus, with this information, the IWK can easily conduct monitoring and identify which development that has already connected to an existing SPPA (Martin J. Bunch et.al, 2012). Based on the information of PEV, private STP and IST updated in IGIS, it will help the IWK to monitor which development have submitted their PDC1 or already taken over. Through this new capability, it will help the IWK to observe any illegal connections, to take a legal action against the premise owner, and to monitor any new development that has not been recorded into IGIS based on the results from the PEV.

An Analysis for Outstanding Bill

One of the new spatial data requests form the IGIS respondent during the face-to-face interview is to add the information of property buyers into IGIS. This property buyers' information is based on the form called the 'Purchaser List', taken from the

complete documentation submitted by CA to PLS. Then the GIS unit will update the related information such as the owner's name, house number, street name, location name, IC number, contact number and others into IGIS. This IGIS database automatically will link with the system called 'Billing and Revenue Information System (BRAINS)' controlled by CBCD. Thus, with this new capability of IGIS, the CBCD staff can monitor easily the unpaid customers with which location and they also can send a reminder letter to them.

CONCLUSION

In conclusion, all the respondents agreed that the outcomes of improving the existing IGIS are very useful and beneficial to all parties in IWK. The new capabilities of IGIS such as an analysis for outstanding bill and an analysis for the public complaint, will help the IWK to manage the sewerage system more efficiently. Using these new capabilities, the IWK can improve their work, conduct proper planning in controlling the number of STP every year. The main objective of this improvement of IGIS is intended to ensure that all related information on sewerage is updated regularly and strategically. Thus, IGIS will be able to assist all the related departments in IWK to solve their problems including monitoring unpaid customers. Known as the 'enabling technology', the GIS also can be integrated with various technologies, especially related to the spatial data such as a remote sensing because of its various abilities.

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LAND CONVERSION PROCESSES AND LOCAL COMMUNITY ASSESSMENT IN THE DISTRICT OF PETALING

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Abstract

Land use planning is part and parcel of both land development and town planning. In Malaysia, these two areas are steered independently, the former by a state or district's land office and the latter by the state's local authority. This study looks at the aspects of land development where land use conversion plays a crucial part, where it brings significance to land revenue. As the leading district in Malaysia, the district of Petaling is undeniably the busiest land office in the nation, working hand-in-hand with three city councils. Land premium that is imposed on approved applications for land use conversion has been one of the main contributors to the district and state's revenue as a whole. Given the hefty charges that have been imposed by the consultants for land use conversions, it is found that the application charges that are imposed by the land office are minimal. An assessment study on land conversion has been conducted and the result shows that the local community assessment score on familiarity, collectively stands at only 40%. It is recommended that an awareness on land use as basic knowledge should be given priority as it may contribute to more efficient land development and town planning, as a whole.

Keywords: Land conversion, land use planning, land premium

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INTRODUCTION

One of the key performance indexes for a district is the revenue that it generates annually. According to the National Auditor General Report 2019 (*Laporan Ketua Audit Negara 2019*), the state of Selangor has been generating hundreds of millions to billions of incomes every year and the district of Petaling has been a top contributor to the state (National Auditor Department, 2019). The two main revenue collections come from the payment of land premium and quit rent, which is also known as land tax. It is significant to note that about 70% from the collections come from the payment of land premium. Land premium is collected upon the approval of land matters that include land use conversion and extension of lease. These land matters are crucial in terms of land development which supports town planning. Both land use conversion and expansionary zoning are one of the main sources of fiscal revenue for a local government (Hortas-Rico & Gómez-Antonio, 2020).

The economical urban land in turn helps to boost the local government's revenue through transactions and tax impositions (Chen et al., 2018). It is a challenging process, given the fact that it requires land use changes in order to achieve urban growth (Briassoulis, 2008; Hillier, 2007; McNeill et al., 2014; Wong & Watkins, 2009; Hersperger et al., 2020). Land use will have to change in order to accommodate social demands, and the ability of the authorities to cater to these changes through its existing policies will most likely hinder land use contradictions (Tian et al., 2020). Seeing the importance of land use and land use conversion in the aspects of town planning and land revenue generation, this study is conducted to share knowledge on the procedures and fees that are imposed in regards to land use conversion. For the purpose of understanding the procedures and how it relates to the statistics of land conversion processes, the selected case study area has been narrowed down to the district of Petaling, where a local community assessment study has been conducted and discussed in the research finding section.

LAND USE CONVERSION IN THE NLC 1965

Land conversion is initiated through an application by the land proprietor or through the power of attorney with the intentions to vary the existing use of land for an activity that conforms to the land title's express condition. In other words, and as an example, a land proprietor shall apply for a variation of category and or express condition of the land from 'Agriculture' to 'Residential Building' in order to have a house(s) built on an existing land for agricultural use. Referring to Section 52 of the National Land Code 1965 (NLC), there are three categories of land use, they are (i) *Agriculture*; (ii) *Building*; and (iii) *Industrial*. The specifics of the activities that are allowed as per land use is provisioned within Section 120 of the NLC, where the State Authority may impose express conditions and restrictions in interest. Through this provision, the Selangor Lands

and Mines Office (PTGS) with the State Authority's approval, has released a circular that is known as *Pekeliling PTG. Sel. 4/98* (Selangor Lands and Mines Office, 1998) which entails further types of activities that are allowed for each land use category and its express condition. It is also to be noted that through this circular, the land use category of 'Building' is divided into four sub-categories, which are (i) *Residential*; (ii) *Commercial*; (iii) *Infrastructure*; and (iv) *Multipurpose*. Therefore, referring to the earlier given example, a land proprietor shall vary the land use category and express condition for the purpose of building a home as follows:

Land Use Category: Agriculture	→	New Land Use Category: Building
Express Condition: General agriculture	→	New Express Condition: Residential

Land conversion may be applied through the various provisions within the NLC. The variety of provisions is due to reasons such as the type of land title, either a Qualified Title (QT) or a Final Title (FT), and the final outcome of a land title that the land proprietor intends to have. However, there is a slight difference in the provision that is stated within the S.204D's reference document (Pejabat Daerah dan Tanah Petaling, 2019a) where it has been stated as S.204B, instead of 204D as per NLC's provisions. According to the Selangor Lands and Mines Office who provides the guidelines for all the land offices in Selangor, S.204B is used as it refers to the approving power and not the provision in regards to an application. Additionally, in the state of Selangor, the two provisions of S.197 and S.76 of the NLC are also being used for land conversion. The difference in S.204D and S.197 & S.76 is that the former 'guarantees' ownership of land to the original proprietor(s) with the proposed land conversion as per the approved planning permission. As for the latter, S.197 is an act of surrendering the land as a whole to the State Authority, and proposing a fresh alienation to whoever in accordance to the proprietor(s) wishes, and as according to the approved planning permission.

In terms of land conversion, both provisions of S.197 and S.76 are proposed to the State Authority for approval, but are subjected to terms, conditions and or any other decisions that the State Authority sees and deems as fitting. S.197 and 76 also help to accommodate the situation when a land title is still in QT status and does not have a Certified Plan as of the date of application, compared to S.204D which requires a QT-status land title to be supported with a Certified Plan upon submission. Table 1 is a summary of the land conversion provisions, some of the key requirements and or factors that are affecting the

application and the application fees that have been imposed based on the Selangor Land Rules 2003 and Selangor Quarry Rules 2003.

Table 1: NLC Provisions in regards to Land Conversion and its Key Requirements

No.	Provision (Section in NLC)	Requirements		Land matters allowed	Application Fee (based on SLR)
		Land Title	Proprietorship		
1.	S.124A	FT	Only same proprietors for each land in submission	Simultaneous subdivision and vary condition	Between RM120 to RM600
2.	S.124(1) (a) & (c)	QT or FT	Only same proprietors for each land in submission	Vary category and express condition	Between RM70 to RM140
3.	S.124(1) (c)	QT or FT	Only same proprietors for each land in submission	Amend express condition	
4.	S.204D	FT	Only same proprietors for each related land in submission	Simultaneous subdivision, amalgamation, vary condition, lease extension	Between RM50 to RM200
Additional administrative provision in Selangor:					
5.	S.197 & S.76	QT or FT	May have ≥ 1 proprietor & multiple land in submission	Simultaneous subdivision, amalgamation, vary condition, lease extension, change proprietorship (upon land alienation)	Between RM50 to RM300

THE PROCESS AND STANDARD PROCEDURES

For the purpose of a simplified and brief explanation, these are the steps in land use conversion of the approved applications:

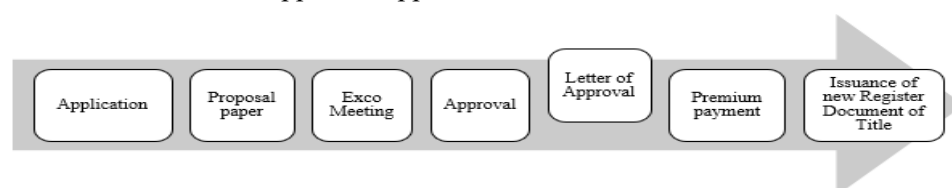


Diagram 1: Land Use Conversion Process

Table 2 is a summary of some of the key requirements for each application. Highlighted here is the ‘Approved Planning Permission’ in which has been issued by Local Authorities (LA) through the provisions of S.22 of the

Town and Country Planning Act 1976. The role of LA was described in Subsection 5(1); where LA shall act as a Local Planning Authority (LPA) and are responsible in controlling the development of land, building, industry and any related public places matters within their respective administrative area. (Yusup et.al, 2018; Lim S. et.al, 2017).

Table 2: NLC Provisions in regards to Land Conversion and its Key Requirements

No.	Provision (Section in NLC)	Requirements			Reference
		LAND TITLE	Proprietorship	Document	
1.	S.124A	FT	Only same proprietors for each land in submission	Approved Planning Permission	(Pejabat Daerah dan Tanah Petaling, 2019c)
2.	S.124(1)(a) & (c)	QT or FT	Only same proprietors for each land in submission	'Kembaran A'*	(Pejabat Daerah dan Tanah Petaling, 2019d)
3.	S.124(1)(c)	QT or FT	Only same proprietors for each land in submission	'Kembaran A'*	
4.	S.204D	QT or FT	Only same proprietors for each contiguous land (two or more land lots)	Approved Planning Permission and Certified Plan (if QT is submitted)	(Pejabat Daerah dan Tanah Petaling, 2019a)
5.	S.197 & S.76	QT or FT	May have ≥ 1 proprietor & multiple land in submission	Approved Planning Permission	(Pejabat Daerah dan Tanah Petaling, 2019b)

*Kembaran 'A' is a declaration form of land condition and use by applicant, for the verification of land office's Settlement Officer

RESEARCH METHODOLOGY

This study uses positivist method and causal-comparative research design (Chua, 2020) to explore the relationship between variables that are relevant to the study. Accordingly, the total sample size is 400 which is derived using Slovin's Formula with 5% sampling error and 95% confidence level. Due to the COVID-19 pandemic, a large population number, i.e., hundreds of respondents were needed, hence a Snowball sampling technique was used for the purpose of distribution, channelled through the *WhatsApp* mobile application. A set of Google Form questionnaire, with straight-forward single-select multiple-choice and 'yes' or 'no' questions, was distributed over a period of two months and a total of 500 people had responded. However, only 434 relevant respondents were applicable to this study. Correspondingly, Diagram 2 shows the overall research methodology.

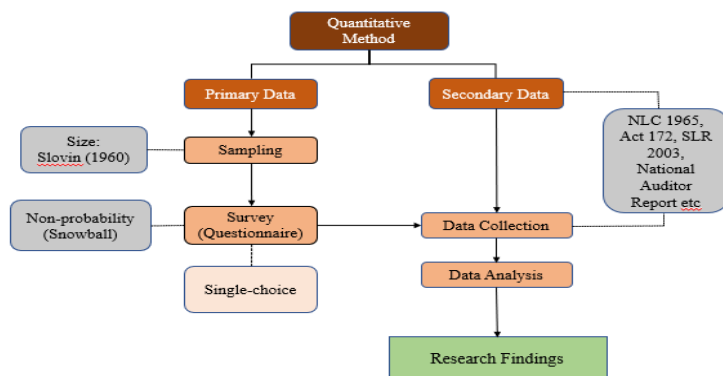


Diagram 2: Research Methodology Flowchart

CASE STUDY AREA

The district of Petaling is located in the state of Selangor, with an area of 486.99 kilometre² and makes up to about 6% of the state. Ranking at the top of the list for district performance in Malaysia, Petaling is also the most populated district with a population of 2.19 million residents. The district’s residents per se represents 11.6% of the Malaysian population. Diagram 3 show the four main parish in Petaling District.

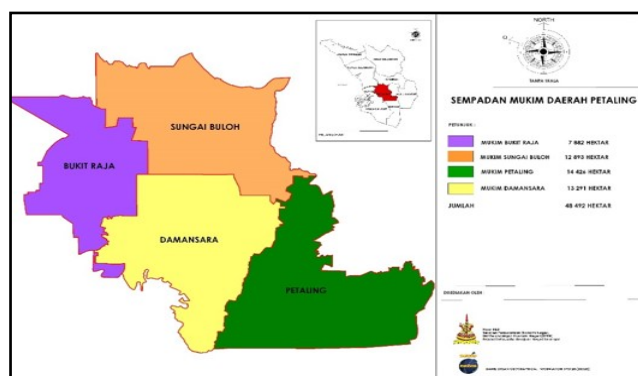


Diagram 3: The four main parish (*mukim*) in Petaling district

Source: Petaling District and Land Office’s Official Website via <https://www.selangor.gov.my/petaling.php/pages/view/27?mid=114>

LAND CONVERSION STATISTICS IN PETALING

This section shows the reality of the land conversion applications, whether or not every application has been processed, approved and or paid. It is significant to understand these facts as the effects shall be explained in the following section.

Based on Table 3, one application has been rejected due to the failure to fulfil the application requirement as is stated within the provisions of S.203(1) of the NLC, where the application has not been made by the same set of proprietors of each adjoining land.

Table 3: Statistics of Land Conversion Application in Petaling District for year 2018, 2019 and 2020

No	Land Matter (Section in NLC)	No. of application			Approved			Rejected			Payment settlement (no. of applicant paid)		
		YEAR	'18	'19	'20	'18	'19	'20	'18	'19	'20	'18	'19
1.	S.124A	1	1	0	1	1	0	0	0	0	1	1	0
2.	S.124(1)(a) & (c)	35	36	17	32	21	5	0	0	0	18	18	5
3.	S.124(1)(c)	0	10	4	0	3	2	0	0	0	0	2	2
4.	S.204D	51	33	12	27	24	1	1	1	1	17	22	1
5.	S.197 and S.76	15	18	13	12	8	3	0	0	0	8	6	3
Total		102	98	46	72	57	11	1	1	1	44	49	11

Other than that, the applicant of S.204D has been rejected due to land use for Limited Commercial purposes, which does not exist within any land use category as per *Pekeliling Pengarah Tanah dan Galian Bil. 4/98* (Selangor Lands and Mines Office, 1998). Furthermore, the application has been rejected under S.204D due to the failure of getting the signature of one of the land proprietors, who has died and has not nominated any executor nor land administrator on his behalf. In summary, when applications are, (i) Rejected or (ii) Still in process, the land use shall remain the same and may be subjected to enforcement. For applications that have been accepted and that are still in process, enforcement measures on contradicting land use may be withdrawn temporarily as applications have been endorsed on the land title, thus giving proof that land use change is already in process.

DUE PAYMENT AND FAILURES ON FULL SETTLEMENT

Upon approval from the State Authority and notice, the applicant shall settle in full all premium payment that is due for land conversion. The date of effect starts from the day when the notice of payment for Form 5A or 7G has been served. Referring to the Selangor Lands and Mines Office Circular No. 1/2016 (*Pekeliling Pengarah Tanah dan Galian Selangor Bil 1/2016*) (Selangor Lands and Mines Office, 2016), no staggered or instalment-like payment is allowed, and the period of payment in full is as per Table 4 below:

Table 4: Period of Payment for each land conversion type according to Section in National Land Code 1965

No.	Land Matter (Section in NLC)	Notice (Form)	Initial payment period	1 st Payment extension (as per official application)	2 nd Payment extension (as per official application)	3 rd Payment extension with additional charge (%) of premium	Total payment period
1.	S.124A	7G	3 months	3 months	1 month	3%	7 months
2.	S.124(1) (a) & (c)	7G	3 months	3 months	1 month	3%	7 months
3.	S.124(1) (c)	7G	3 months	1 months	1 month	3%	7 months
4.	S.204D	5A	6 months	6 months	Not allowed	Not applicable	12 months
5.	S.197 and S.76	5A	6 months	6 months	Not allowed	Not applicable	12 months

Premium rates for land conversion are as per Table 5. The failure to settle the land premium will lead to an annulled land use conversion approval, hence the land use remains the same. If a land proprietor decides to continue with the intended development or existing land use which does not conform to its express condition, the land proprietor shall be charged with a breach of condition under S.125 of the NLC, which may lead to land forfeiture under the provision of S.130 of NLC, if the issue is not remedied within the given time.

Table 5: Premium rate for each land conversion type according to Selangor Land Rules 2003 & Selangor Quarry Rules 2003

Initial Land Use	Approved Land Use	Rate of payment (Calculation Formula)
Agriculture	Residential	15% of current land value x land area (in metre ²)
	Industry	Light Industry: 20% Medium Industry: 25% Heavy Industry: 30% of current land value x land area (in metre ²)
	Commercial	30% of current land value x land area (in metre ²)
Residential	Agriculture	Not applicable
	Industry	Light Industry: 15% Medium Industry: 10% Heavy Industry: 15%

Initial Land Use	Approved Land Use	Rate of payment (Calculation Formula)
		of current land value x land area (in metre ²)
	Commercial	15% of current land value x land area (in metre ²)
Industry	Agriculture	Not applicable
	Residential	RM100.00 (Nominal) per title
	Commercial	10% of current land value x land area (in metre ²)
Commercial	Agriculture	Not applicable
	Industry	RM100.00 (Nominal) per title
	Residential	RM100.00 (Nominal) per title

RESEARCH FINDINGS

In regards to contradicting land use and a breach of condition under S.125 of the NLC, an assessment was conducted on the local community of Selangor in terms of land use conversion. The reason for the expansion of the area of study is to gain an overall view, as policies that have been implemented have not been focused down to district-level but have been implemented state-wide. Table 6 shows the results of the local community assessment on land use conversion. It is concluded that only 80.8% of those who are employed and who are aged between 21 and 50 have seen a land title, yet only half of these respondents are familiar with land conversion. Although this group of respondents has scored the highest in terms of familiarity on land conversion, only 8.5% have actually submitted an application for land conversion, while almost half of them feels that the premium that has been imposed is high.

Table 6: Results of study of local community assessment on land use conversion

Subject	Employed (Age 21 and above)		Unemployed (Age 21 to 50)		Unemployed (Age 51 & above)		Total	
		%		%		%		%
Seen a Register Document of Title	286	80.8	21	61.8	34	73.9	341	78.6
Familiar with land conversion	183	51.7	8	23.5	21	45.7	212	48.8
Submitted an application	30	8.5	1	2.9	6	13.0	37	8.5

Subject	Employed (Age 21 and above)	%	Unemployed (Age 21 to 50)	%	Unemployed (Age 51 & above)	%	Total	%
for land conversion								
Aware of the imposition of Further Premium upon approval	140	39.5	6	17.6	15	32.6	161	37.1
Submitted application and feels that premium imposed is:								
High	13	43.3	0	0.0	0	0.0	13	3.0
Affordable	10	33.3	1	2.9	2	33.3	13	3.0
Low	0	0.0	0	0.0	0	0.0	0	0.0
Not sure	6	20.0	0	0.0	3	50.0	9	2.1
Total Respondent (s)	354	81.6	34	7.8	46	11.9	434	100

On the other hand, 61.8% of those who are unemployed and who are aged 21 to 50 have seen a land title, and just like its counterpart this group of respondents has scored way below the average for familiarity in land conversion. Only one person from this group of respondents has submitted an application for land conversion and has considered it to be affordable. As for the group of respondents who are aged 51 and above and who are unemployed, 73.9% of them have seen a land title and almost half is familiar with land conversion. Six persons from this group have submitted an application for land conversion where 50% of them are not sure of how they feel about the premium rates that have been imposed. This also shows that this group of veterans have better awareness in land conversion as compared to the unemployed youngsters. With the results of the survey questionnaire, it is evident that only 40% of the local community in Selangor is aware of land use conversion in spite of the overall 70% who has actually seen a land title. Moreover, due to less than half of the total respondents who are familiar with land conversion, it also means that only a fraction of the

people knows about land use and what is allowed, as is stated in a land title through its land use category and express condition.

CONCLUSION

It is not surprising that the public of Petaling and Selangor are oblivious of land use and land use conversions, as these land matters do not affect them on a day-to-day basis. The only time that land conversions are of significance is when land development is required or changes in land use plans were made to boost land growth. As per land use conversion, the premium rates of the post conversion approval may seem to have sky-rocketed but in reality, it mirrors the value of the land for its intended use. These are some of the facts that may or may not reach to the public as land and property owners. With an overall score as low as 40% in the local community assessment- in terms of familiarity with land conversion, it is recommended that an awareness on land use as basic knowledge should be a priority as it may contribute to more efficient land development and town planning as a whole.

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SATISFACTION WITH LIFE AND HUMAN NEEDS FULFILLMENT

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Abstract

The two notions discussed in the paper are Life Satisfaction, under Subjective Well-Being (SWB) field; and Maslow hierarchy of human needs. *Issue:* Human needs satisfaction is not an all-or-nothing phenomenon. Individuals are not required to completely satisfy one need in order for the next need to appear in the hierarchy. *Purpose:* This paper aims to investigate the level of life satisfaction in relation to the difficulty and convenience of achieving human needs. *Approach:* Mann Whitney U-Tests were conducted to determine the mean of SWL across difficulty and convenient of fulfilling 24 human needs. These human needs are the necessities and life conditions commonly and widely struggled for. *Findings:* The ease with which the majority of human needs can be met increases life satisfaction significantly. The findings also revealed that for five human needs for which life satisfaction did not differ significantly, meeting these human needs was unlikely to influence life satisfaction. Maslow's Hierarchy of Needs classified these needs as biological and physiological needs, safety and security needs, and esteem needs.

Keywords: human needs, subjective wellbeing

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INTRODUCTION

Urban planning engages human activities not only through its physical functions, but also via psychological meanings to create opportunities for meaningful development. Among factors affecting social sustainability in urban context is satisfying human needs. This paper aims to assess the statistical interaction between human needs fulfilment and satisfaction with life.

LITERATURE REVIEW

The two notions discussed in the paper are (i) Life Satisfaction, under Subjective Well-Being (SWB) field; and Maslow hierarchy of human needs.

Two philosophical traditions of SWB are hedonic and eudaimonic approaches. The hedonic approach, understood as maximization of pleasure and minimization of pain, consists of two key components: the cognitive or the judgemental component and the affective or the emotional component. Life satisfaction refers to a judgmental process in which people judge their life on the basis of their own particular set of parameters or unique set of criteria (Diener, 1984). Life satisfaction is not only more stable and longer-lived than the concept of happiness, but is much wider in scope. It is the overall feeling about life, and how pleased people are about how it is going.

A comparison of one's perceived life circumstances is presumably made with a self-imposed standard or set of expectations, and to the extent that conditions meet these standards, high life satisfaction is recorded by the person. Life satisfaction is, therefore, a deliberate cognitive assessment of one's life in which the judgment requirements are up to the person. Therefore, life satisfaction is more conceptualized under cognitive components. Diener et al (1985) sought to address the cognitive component of subjective wellbeing by creating the Satisfaction with Life Scale [SWLs].

The SWLs is the instrument developed to quantify the cognitive components of life satisfaction. The SWLS is not intended to help understand satisfaction with any particular area of life, such as health, finances or relationships, but the scale help to get a sense of satisfaction with life as a whole. The five SWLs statements are

1. In most ways, my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far, I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

In this paper, only the last two statements of SWLs were utilized for analyses. The psychometric properties on the data gathered shows that the last two statements highly explained the variance of the top three statements.

The Hierarchy of Needs [HON], introduced and later revised by Maslow (Abraham Harold Maslow, 1954, 1970, 1987) defined the phases of human motivation. The stages of human motivation are seen in a linear pyramid of eight tiers of motivational needs. In order for a person to progress to the higher level on the HON, the needs at the lower level of must be fulfilled. The longer the needs at the lower level denied, the more urgent it is to fulfil them. When a person is happy with the fulfilment of the basic needs, he or she could move on to the next level and eventually to the growth needs, that is to say, self-actualization and self-transcendence.

Table 1 Understanding of HON Phases

#	Phases	Understanding
1	Biological and Physiological Needs	The bodily need for homeostasis; that is, maintaining consistent levels in different bodily system. The motivation derives from instincts to survive, i.e., the need for shelter, water, food, warmth, rest, and health. All needs are secondary until this need is fulfilled.
2	Safety and Security Needs	The need to feel safe and secure in life and surroundings. These are the efforts to seek protection from violent or harmful conditions, health threats, sickness and economic pressures in order to live and thrive in modern societies.
3	Belonging and Love Needs	The need to give and receive love and sense of belongingness through supportive and communicative friendship and family and intimate relationships. When deprived of these needs, one may experience guilt, loneliness, depression or low extraversion values.
4	Esteem Needs	The need for self-confidence and to be recognized. These needs are fulfilled through positive feelings of self-worth via achievement, accomplishment, appreciation and recognition. Without fulfilment of this need, feelings of inferiority are experienced.
5	Cognitive Needs	The need to know and understand, fulfilled via yearning for knowledge and increased intelligence. One needs to learn, explore, discover and create towards better understanding of the world around. Without it may lead to confusion and identity crisis.
6	Aesthetic Needs	The need to refresh oneself in the presence and beauty of nature while carefully absorbing and observing their surroundings to extract the beauty that the world has to offer. They are fulfilled through appreciation and search for beauty and balance.
7	Self-Actualization	The instinctual needs to make the most of their abilities and to strive to be the best. This need when fulfilled leads to the feeling of generativity – to vote, form, volunteer, nurture and guide others for the good of the next generation or to outlast oneself.
8	Transcendence Needs	The need to connect beyond ego and personal self or to help others to find self-fulfilment and realize their potential. Also refers to as spiritual needs, accessible from many levels and when fulfilled, leads to feelings of integrity to take things to another level of being.

While Maslow articulated the needs in a hierarchy, he recognized that satisfying any need is not an all-or-nothing phenomenon. There is no requirement for individuals to entirely fulfil one need in order for the next need to appear in the hierarchy. Maslow indicates that, at any given time, most people seem to have partially fulfilled each of their needs—and those needs that are lower in the hierarchy are usually those that people have made the most strides against. Important development in the SWB literature on the human needs’ fulfilment for the enhancement of SWB are emphasized in the basic concepts of human needs.

There are two opposing views that can be formed from the literatures. Firstly, it is commonly implied that to attain satisfaction, human needs must be fulfilled. That is, satisfaction is unreachable without meeting the human needs. Secondly, meeting of some of the human needs can be shallow. For example,

wealth can sometimes bring unhappiness. Thus, fulfilling or over-fulfilling some needs could lead to ill-being and disappointment. In certain situations, partially fulfilled or unfulfilled needs would bring meaningfulness in life, thus uplift SWB.

In this paper, the human needs are categorized under (i) Basic Necessities, (ii) Complementary Needs, and (iii) Desired Opportunities. These stages are helpful in recognising the condition of the living system if the needs are yet to be fulfilled. If the Basic Necessities were not fulfilled, the living system would be disrupted. If the Complementary Needs were not fulfilled, the living system would not be disrupted, but lives would be difficult. If the needs of Desired Opportunities were not fulfilled, the living system would not be disrupted, nor lives would be difficult (Abu Bakar et al., 2016, 2018, 2019b, 2019a; Abu Bakar, Mohamed Osman, Bachok, & Abdullah, 2017; Abu Bakar, Mohamed Osman, Bachok, Zen, & Faris Abdullah, 2017; Abu Bakar, Mohamed Osman, Bachok, Zen, Abdullah, et al., 2017; Bakar et al., 2019; Ibrahim et al., 2019; Mohamed Osman et al., 2017). Based on the HON, 24 human needs are derived for empirical assessment (refer to Table 1 and Table 2).

Table 2 Human Needs Categories

Human Needs Stages	Hierarchy of Needs	No.	Human Needs
<i>Without it, living system is disrupted</i>	Biological & Physiological Needs	1	Nutritious Food
		2	Medical Treatment
		3	Clean Water (for Wash & Drink)
		4	Clean Air
		5	Well-Function Toilet
	Safety & Security Needs	6	Adequate Electricity
		7	Affordable Houses and Amenities
		8	Financial Stability
		9	Personal Security
		10	Health Assurance
<i>Without it, living system is not disrupted, and lives would be difficult</i>	Belonging and Love Needs	11	Balance in Work and Personal Time
		12	Social Tolerance
	Esteem Needs	13	Communication Line
		14	Internet Connection
		15	Primary School Accomplishment
		16	Secondary School Accomplishment
<i>Without it, living system is not disrupted, and lives would not be difficult</i>	Cognitive Needs	17	Tertiary School Accomplishment
		18	Job Opportunity
	Aesthetic Needs	19	Well-Maintained Recreational Park
		20	Diversity of Flora and Fauna
		21	Rights to Choose Leaders
		22	Freedom of Speech
		23	Corruption Free Opportunities
		24	Freedom to Express Arts & Diversity

Based on the human needs best represent the phases of HON, the respondents were inquired whether they found each of the human need difficult or convenient to meet.

METHOD

A sample of 4,315 was analysed after the data screening process. The Malaysian respondents were given an 11-point Likert scale to respond to items pertaining to Satisfaction with Life [SWL]. Kolmogorov-Smirnova Test-results indicate the data was not normally distributed. Mann Whitney U-Tests were conducted to determine the mean of SWL across difficulty and convenient of fulfilling 24 human needs.

RESULTS

The following tabulations demonstrate (i) mean distribution of SWL items, (ii) normality test results for SWL items across difficulties and conveniences of human needs, (iii) Mann Whitney U-Test results and (iv) Mann Whitney U-Test interpretation.

Table 3 Mean Distribution of SWL Items

Indicators	Code	\bar{x}	$\bar{x}SWL$
So far, I have gotten the important things I want in life	SWL1	8.08	7.96
If I could live my life over, I would change almost nothing	SWL2	7.85	

Note. Mean Distribution of PE Items (\bar{x}) and Overall Mean of SWL ($\bar{x}SWL$)

Table 4 Normality Test-Results

HUMAN NEEDS (SWL)	Difficult					
	Difficult			Convenient		
	Statistic	df	p	Statistic	df	p
Nutritious Food	.087	336	.000	.079	3979	.000
Medical Treatment	.085	423	.000	.078	3892	.000
Clean Water (for Wash & Drink)	.112	392	.000	.076	3923	.000
Clean Air	.073	805	.000	.080	3510	.000
Well-Function Toilet	.086	428	.000	.076	3887	.000
Adequate Electricity	.100	1114	.000	.069	3201	.000
Affordable Houses and Amenities	.075	1861	.000	.079	2454	.000
Financial Stability	.086	1578	.000	.084	2737	.000
Personal Security	.076	1330	.000	.082	2985	.000
Health Assurance	.070	1325	.000	.087	2990	.000
Balance in Work and Personal Time	.075	1582	.000	.079	2733	.000
Social Tolerance	.073	1310	.000	.083	3005	.000
Communication Line	.091	328	.000	.078	3987	.000
Internet Connection	.070	923	.000	.081	3392	.000
Primary School Accomplishment	.091	313	.000	.077	4002	.000
Secondary School Accomplishment	.074	390	.000	.078	3925	.000
Tertiary School Accomplishment	.071	836	.000	.079	3479	.000
Job Opportunity	.070	1678	.000	.082	2637	.000
Well-Maintained Recreational Park	.073	1430	.000	.089	2885	.000
Diversity of Flora and Fauna	.070	1453	.000	.088	2862	.000
Rights to Choose Leaders	.073	1823	.000	.089	2492	.000
Freedom of Speech	.072	1957	.000	.084	2358	.000
Corruption Free Opportunities	.077	2247	.000	.077	2068	.000
Freedom to Express Arts & Diversity	.074	1531	.000	.087	2784	.000

Note. Kolmogorov-Smirnova Test-Results of $\bar{x}\Sigma$ PE across Difficult and Convenient.

Table 5 Mann Whitney U-Test Results

HUMAN NEEDS (SWL)	Difficult			Convenient			U	z	p
	N	$\bar{x}R$	\bar{x}	N	$\bar{x}R$	\bar{x}			
Nutritious Food	336	1983.82	8.0	3979	2172.71	8.0	609947.0	-2.680	.007
Medical Treatment	423	1962.77	7.5	3892	2179.22	8.0	740576.0	-3.408	.001
Clean Water (for Wash & Drink)	392	2211.78	8.3	3923	2152.63	8.0	747826.0	-0.900	.368
Clean Air	805	2065.29	8.0	3510	2179.26	8.0	1338147.0	-2.351	.019
Well-Function Toilet	428	2108.24	8.0	3887	2163.48	8.0	810519.0	-0.874	.382
Adequate Electricity	1114	2132.59	8.0	3201	2166.84	8.0	1754645.0	-0.794	.427
Affordable Houses and Amenities	1861	2008.48	7.5	2454	2271.39	8.0	2005184.5	-6.895	.000
Financial Stability	1578	1954.96	7.5	2737	2275.06	8.0	1839095.0	-8.164	.000
Personal Security	1330	2061.99	8.0	2985	2200.78	8.0	1857336.5	-3.394	.001
Health Assurance	1325	1969.48	7.5	2990	2241.54	8.0	1731081.0	-6.646	.000
Balance in Work and Personal Time	1582	1986.14	7.5	2733	2257.48	8.0	1889928.0	-6.924	.000
Social Tolerance	1310	1975.74	7.5	3005	2237.45	8.0	1729515.0	-6.373	.000
Communication Line	328	1999.82	8.0	3987	2171.01	8.0	601986.5	-2.403	.016
Internet Connection	923	2006.50	8.0	3392	2199.22	8.0	1425577.0	-4.185	.000
Primary School Accomplishment	313	2139.34	8.0	4002	2159.46	8.0	620472.5	-0.276	.782
Secondary School Accomplishment	390	2110.29	8.0	3925	2162.74	8.0	746769.5	-0.796	.426
Tertiary School Accomplishment	836	2033.38	7.8	3479	2187.95	8.0	1350039.5	-3.235	.001
Job Opportunity	1678	2008.52	7.5	2637	2253.12	8.0	1961607.5	-6.315	.000
Well-Maintained Recreational Park	1430	1967.95	7.5	2885	2252.20	8.0	1791000.5	-7.086	.000
Diversity of Flora and Fauna	1453	1985.54	7.5	2862	2245.55	8.0	1828664.5	-6.507	.000
Rights to Choose Leaders	1823	2016.47	7.5	2492	2261.54	8.0	2013445.0	-6.410	.000
Freedom of Speech	1957	2026.03	7.5	2358	2267.52	8.0	2049046.5	-6.366	.000
Corruption Free Opportunities	2247	2074.58	8.0	2068	2248.64	8.0	2135949.5	-4.605	.000
Freedom to Express Arts & Diversity	1531	1899.87	7.5	2784	2299.96	8.0	1735949.0	-10.137	.000

Note. Mean Rank of $\bar{x}\Sigma$ SWL across Difficult and Convenient; **Bold** shows higher mean rank.

Table 6 Mann Whitney U-Test Results Interpretation

HUMAN NEEDS (SWL)	INTERPRETATION
Biological and Physiological Needs	Nutritious Food Those who claimed convenient had greater mean rank (N = 3979, $\bar{x}R$ = 2172.71) than those who claimed difficult (N = 336, $\bar{x}R$ = 1983.82). A statistically significant difference was found (U = 609947.0, p = .007).
	Medical Treatment Those who claimed convenient had greater mean rank (N = 3892, $\bar{x}R$ = 2179.22) than those who claimed difficult (N = 423, $\bar{x}R$ = 1962.77). A statistically significant difference was found (U = 740576.0, p = .001).
	Clean Water (for Wash & Drink) Those who claimed difficult had greater mean rank (N = 392, $\bar{x}R$ = 2211.78) than those who claimed convenient (N = 3923, $\bar{x}R$ = 2152.63, but the difference was not statistically significant 747826.0, p = .368).
	Clean Air Those who claimed convenient had greater mean rank (N = 3510, $\bar{x}R$ = 2179.26) than those who claimed difficult (N = 805, $\bar{x}R$ = 2065.29). A statistically significant difference was found (U = 1338147.0, p = .019).
	Well-Function Toilet Those who claimed convenient had greater mean rank (N = 3887, $\bar{x}R$ = 2163.48) than those who claimed difficult (N = 428, $\bar{x}R$ = 2108.24, but the difference was not statistically significant 810519.0, p = .382).
Safety and Security Needs	Adequate Electricity Those who claimed convenient had greater mean rank (N = 3201, $\bar{x}R$ = 2166.84) than those who claimed difficult (N = 1114, $\bar{x}R$ = 2132.59, but the difference was not statistically significant 1754645.0, p = .427).
	Affordable Houses and Amenities Those who claimed convenient had greater mean rank (N = 2454, $\bar{x}R$ = 2271.39) than those who claimed difficult (N = 1861, $\bar{x}R$ = 2008.48). A statistically significant difference was found (U = 2005184.5, p = .000).
	Financial Stability Those who claimed convenient had greater mean rank (N = 2737, $\bar{x}R$ = 2275.06) than those who claimed difficult (N = 1578, $\bar{x}R$ = 1954.96). A statistically significant difference was found (U = 1839095.0, p = .000).

Table 7 Mann Whitney U-Test Results Interpretation (Continued)

HUMAN NEEDS (SWL)		INTERPRETATION
Safety and Security Needs	Personal Security	Those who claimed convenient had greater mean rank (N = 2985, $\bar{x}R = 2200.78$) than those who claimed difficult (N = 1330, $\bar{x}R = 2061.99$). A statistically significant difference was found (U = 1857336.5, p = .001).
	Health Assurance	Those who claimed convenient had greater mean rank (N = 2990, $\bar{x}R = 2241.54$) than those who claimed difficult (N = 1325, $\bar{x}R = 1969.48$). A statistically significant difference was found (U = 1731081.0, p = .000).
Belonging and Love Needs	Balance in Work and Personal Time	Those who claimed convenient had greater mean rank (N = 2733, $\bar{x}R = 2257.48$) than those who claimed difficult (N = 1582, $\bar{x}R = 1986.14$). A statistically significant difference was found (U = 1889928.0, p = .000).
	Social Tolerance	Those who claimed convenient had greater mean rank (N = 3005, $\bar{x}R = 2237.45$) than those who claimed difficult (N = 1310, $\bar{x}R = 1975.74$). A statistically significant difference was found (U = 1729515.0, p = .000).
	Communication Line	Those who claimed convenient had greater mean rank (N = 3987, $\bar{x}R = 2171.01$) than those who claimed difficult (N = 328, $\bar{x}R = 1999.82$). A statistically significant difference was found (U = 601986.5, p = .016).
	Internet Connection	Those who claimed convenient had greater mean rank (N = 3392, $\bar{x}R = 2199.22$) than those who claimed difficult (N = 923, $\bar{x}R = 2006.50$). A statistically significant difference was found (U = 1425577.0, p = .000).
Esteem Needs	Primary School Accomplishment	Those who claimed convenient had greater mean rank (N = 4002, $\bar{x}R = 2159.46$) than those who claimed difficult (N = 313, $\bar{x}R = 2139.34$, but the difference was not statistically significant 620472.5, p = .782).
	Secondary School Accomplishment	Those who claimed convenient had greater mean rank (N = 3925, $\bar{x}R = 2162.74$) than those who claimed difficult (N = 390, $\bar{x}R = 2110.29$, but the difference was not statistically significant 746769.5, p = .426).
Cognitive Needs	Tertiary School Accomplishment	Those who claimed convenient had greater mean rank (N = 3479, $\bar{x}R = 2187.95$) than those who claimed difficult (N = 836, $\bar{x}R = 2033.38$). A statistically significant difference was found (U = 1350039.5, p = .001).
	Job Opportunity	Those who claimed convenient had greater mean rank (N = 2637, $\bar{x}R = 2253.12$) than those who claimed difficult (N = 1678, $\bar{x}R = 2008.52$). A statistically significant difference was found (U = 1961607.5, p = .000).
Aesthetic Needs	Well-Maintained Recreational Park	Those who claimed convenient had greater mean rank (N = 2885, $\bar{x}R = 2252.20$) than those who claimed difficult (N = 1430, $\bar{x}R = 1967.95$). A statistically significant difference was found (U = 1791000.5, p = .000).
	Diversity of Flora and Fauna	Those who claimed convenient had greater mean rank (N = 2862, $\bar{x}R = 2245.55$) than those who claimed difficult (N = 1453, $\bar{x}R = 1985.54$). A statistically significant difference was found (U = 1828664.5, p = .000).
Self-Actualization Needs	Rights to Choose Leaders	Those who claimed convenient had greater mean rank (N = 2492, $\bar{x}R = 2261.54$) than those who claimed difficult (N = 1823, $\bar{x}R = 2016.47$). A statistically significant difference was found (U = 2013445.0, p = .000).
	Freedom of Speech	Those who claimed convenient had greater mean rank (N = 2358, $\bar{x}R = 2267.52$) than those who claimed difficult (N = 1957, $\bar{x}R = 2026.03$). A statistically significant difference was found (U = 2049046.5, p = .000).
	Corruption Free Opportunities	Those who claimed convenient had greater mean rank (N = 2068, $\bar{x}R = 2248.64$) than those who claimed difficult (N = 2247, $\bar{x}R = 2074.58$). A statistically significant difference was found (U = 2135949.5, p = .000).
	Freedom to Express Arts & Diversity	Those who claimed convenient had greater mean rank (N = 2784, $\bar{x}R = 2299.96$) than those who claimed difficult (N = 1531, $\bar{x}R = 1899.87$). A statistically significant difference was found (U = 1735949.0, p = .000).

Note. Result Interpretation of Mann Whitney U Test; Bold & Highlighted shows statistically significant output.

19 out of 24 test-results were statistically significant, therefore suggesting with convenience of fulfilling all of the highlighted human needs (refer to Table), SWL was statistically greater.

DISCUSSION

The findings indicate that SWL increases when almost all of the human needs are convenient to meet. Thus, suggesting that the convenience to meet these human needs will heighten overall life satisfaction. However, for certain human needs, in particular (i) clean water, (ii) well-function toilet, (iii) adequate electricity, (iv) primary school accomplishment and (v) secondary school accomplishment; the SWL did not significantly rise across difficulty nor convenience of fulfilment.

Summary of Findings

Condition 1: Difficulty	Condition 2: Convenient	Condition 3: Neither
The difficulty to meet the human need increases SWL	The convenience to meet the human need increases SWL	Neither convenience or difficulty to meet the human need increases SWL
SWL is greater with difficulty to meet the human need.	SWL is greater with convenience to meet the human need.	SWL does not change with convenience nor difficulty to meet the human need.

Hierarchy of Needs	No.	Human Needs	Findings/Condition
Basic Necessities	1	Nutritious Food	SWL increases with Convenience
	2	Medical Treatment	SWL increases with Convenience
	3	Clean Water (for Wash & Drink)	SWL does not change
	4	Clean Air	SWL increases with Convenience
	5	Well-Function Toilet	SWL does not change
	6	Adequate Electricity	SWL does not change
	7	Affordable Houses and Amenities	SWL increases with Convenience
	8	Financial Stability	SWL increases with Convenience
	9	Personal Security	SWL increases with Convenience
	10	Health Assurance	SWL increases with Convenience
Complementary Needs	11	Balance in Work and Personal Time	SWL increases with Convenience
	12	Social Tolerance	SWL increases with Convenience
	13	Communication Line	SWL increases with Convenience
	14	Internet Connection	SWL increases with Convenience
Esteem Needs	15	Primary School Accomplishment	SWL does not change
	16	Secondary School Accomplishment	SWL does not change
Desired Opportunity	17	Tertiary School Accomplishment	SWL increases with Convenience
	18	Job Opportunity	SWL increases with Convenience
	19	Well-Maintained Recreational Park	SWL increases with Convenience
	20	Diversity of Flora and Fauna	SWL increases with Convenience
	21	Rights to Choose Leaders	SWL increases with Convenience
	22	Freedom of Speech	SWL increases with Convenience
	23	Corruption Free Opportunities	SWL increases with Convenience
	24	Freedom to Express Arts & Diversity	SWL increases with Convenience

The two theories of life satisfaction are the bottom-up theories and top-down theories. The bottom-up theories suggest that life satisfaction is an outcome of satisfaction from many life domains. While the top-down theories asserted that overall life satisfaction determine the domain-specific satisfaction. Therefore, while there are several aspects that contribute to life satisfaction in a variety of ways, the overall satisfaction is not necessarily based on the parameters that researchers consider significant, but rather on domains the respondents believe to be most valuable, based on respondents' cognitive judgments.

In this case, the findings suggest that for the five human needs which life satisfaction did not significantly vary, life satisfaction was unlikely influenced by meeting these human needs. These needs were (i) clean water and (ii) well-function toilet, under biological and physiological need; (iii) adequate electricity, under safety and security need; and (iv) primary school accomplishment and (v) secondary school accomplishment, under esteem needs.

There are two inferences which can be derived from the perspective of bottom-up theories and top-down theories of life satisfaction. From the bottom-up understanding, the life satisfaction of the Malaysian respondents was determined by the highlighted 19 human needs, yet life satisfaction was not determined by the mentioned five human needs. That is, to attain life satisfaction, the highlighted 19 human needs must be partially or fully met. From the top-down understanding, it can be asserted that the chances that the highlighted 19 human needs were the best representations of the Hierarchy of Needs [HON] for the Malaysian respondents are high while for the remaining five human needs, the chances are low. The research needs to revise other representations of needs that best represent the three phases of HON from the prospect of life satisfaction.

CONCLUSION

This paper explores the level of life satisfaction across difficulty and convenience across difficulty and convenience of human needs. The findings suggest that life satisfaction significantly increases with convenience of fulfilling the majority of the human needs. However, for (i) clean water and (ii) well-function toilet, under biological and physiological need; (iii) adequate electricity, under safety and security need; and (iv) primary and (v) secondary school accomplishment, under esteem needs; the life satisfaction did not significantly vary. Further investigation should focus on the fitting representation of human needs across the phases of HON. The representation of human needs should also respond to the culture and social development in Malaysia.

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WATER-BASED SETTLEMENTS AND THE URBAN PLANNING CHALLENGES IN INDONESIA A CASE STUDY OF BANJARMASIN CITY

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Abstract

The Banjarmasin city is located in territorial waters. The development is currently causing problems related to the context of the aquatic environment. This is because urban development planning is not in accordance with the environmental context. Therefore, this article aims to determine the sustainability of water-based settlements in aquatic environment in Banjarmasin city. This is a qualitative article with the descriptive method used to explain the environmental structure and architectural elements of water-based settlements. Primary and secondary data were obtained from field observations and the city government in the form of maps and pictures of settlements. The data collected were analyzed with the descriptive approach and concluded using the deductive method. This article reveals the form of residence due to community adaptation to water areas and finds that urban spatial development policies need to understand the community's adaptation process as a local brand of city identity. The concept of 'living with water is a future challenge because it is a water-based cultural adaptation strategy. The architecture of the floating residence has the opportunity to be developed into a floating settlement and city. Therefore, the adaptation of residential architectural forms and environmental structures supports the Banjarmasin city as a waterfront city.

Keywords: Water-based; Settlements; Urban planning; Floating house; Waterfront

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INTRODUCTION

Banjarmasin city is located on the Kalimantan Island-Indonesia and is known for its water-based culture which is preserved to this day (Figure 1). This city has a density of 6,949 inhabitants/km² and is reputable for being the most populous city in South Kalimantan Province (Badan Pusat Statistik 2020). The city is located between *Barito* and the *Martapura* which are the largest rivers with widths between 650-800 meters and also surrounded by 7 medium and 94 small rivers with relatively flat slopes ranging between 0% -3%.

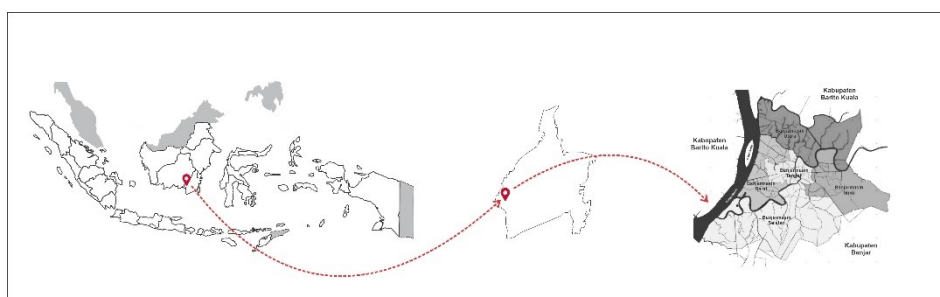


Figure 1. Location of Banjarmasin City (drawn by Yustina)

The local wisdom of the traditional community in Banjarmasin city known as the *Urang Banjar* creates adaptive creativity in the form of the water-based settlement culture and this was observed by some experts to have been around for centuries (Kusno, 2000; Subiyakto 2005). According to Muhammad and Mentayani (2007), the adaptation of people's behavior to a water-based environment existed before the establishment of the *Banjar* Kingdom. This behavioral adaptation marks the existence of a water-based settlement civilization in the Banjarmasin traditional community. Moreover, Saleh (1962) described *Urang Banjar* as "moving by hand" due to the continuous pedaling of a boat or *jukung* across the river all day long. The disconnection with nature impairs sustainability; consequently, the river's value degrades (Rohana, 2021). Waterfront development emerged as one of the important issues of urban design and planning since it provides an opportunity to improve social well-being, economic development and physical setting of a city. In recent decades, many waterfronts have experienced reorientation from brownfield to commercial, residential and recreational areas (Nurbaidura, 2018).

DESCRIPTION OF LOCATION AND PROBLEM

The Banjarmasin community has grown to adapt to the water area with the activities of the settlers observed to be usually above the water level and this forms a resilience culture to the water area conditions. This behavioral response to the environment is reflected in the habits of the population as observed in their choice of movement path and determination of shipping direction towards both the estuary

and upstream of the river as well as the process of anchoring to the mainland. The ability to build and settle on water through the concept of water-based architecture also supports the residents' resilience in their environment. It is, therefore, important to study the resilience and sustainability of water-based settlements in Banjarmasin city to serve as a form of appreciation for the water-based culture which is a local brand and heritage asset of Banjarmasin city. This study is, however, expected to be useful as a reference in planning sustainable water-based urban development. The importance of spatial planning based on the culture of living in Banjarmasin city and carrying out development for sustainability of future generations, is a new attribute added to this manuscript.

RESEARCH METHODS

This is a qualitative article with the descriptive method used to explain the environmental structure and architectural elements in water-based settlements. Primary and secondary data were collected from field observations and the city government in the form of settlement maps and pictures. The data collected were analyzed using the descriptive approach and concluded by deductive method. The qualitative method was adopted in this study to describe water-based settlements in Banjarmasin city and this was conducted through different stages as indicated in the following aspects: a) Environmental context description stage, b) Shelter and citizen activities description stage, c) Challenges of urban planning description stage

RESULT AND ANALYSIS

The environment is generally built from the order of form, place, and understanding and according to Habraken (1998), environmental structure is divided into 3 elements of order. The accommodation process is defined as the inhalation of the place while the assimilation process is explained to be the adjustments in articulating places (Schulz 1980). Rahman et al. (2017) examined how the conservation of historic waterfront areas contributes to the improvement of quality of life in Dhaka City and suggested ways to protect river banks. This is in line with the findings of Jauregui et al. (2019) that a settlement with a frontage to the canal and access to the sea is more valued than those without this access and the same was also observed with the distance of a settlement to open water. This was evident in Stevens's (2009) research that the analysis foregrounds four aspects of the artificiality of urban waterfronts: taming the landscape to provide comfort and safety, augmenting the landscape to provide varied sensory stimulation, carefully positioning the waterfront within a wider climatic, thematic, and functional context, and managing the temporal dimension of the visitor experience. There is, however, the need for the participation of local communities in waterfront planning as stated by Prilenska et al. (2020) in their research that the shortcomings of civic engagement strategies and the desired changes through a series of semi-structured

interviews with key stakeholders involved and the analysis of planning related documentation. Good waterfront planning has the ability to create urban transformation which accommodates floating settlements as described by Dal Cin et.al (2021) that the contribution of this study to scientific research is to highlight the role of public space on the waterfront, both to implement adaptation to flooding phenomena and to implement the urban transformation necessary to accommodate floating settlements. The importance of understanding the history of local culture and the diversity of local values in waterfront planning was identified by Airas et al. (2019) and this was observed in their findings that urban waterfront redevelopments have spread into smaller and suburban communities. The ecological significance of the water environment is explained by Fumagalli (2013) that the definition of a methodology for planning suburban waterfront functions as ecological and recreational. Moreover, improper handling of the water environment has been discovered to have the ability to cause damage to the environmental structure as confirmed by Woo et al. (2017) that the reclamation of land for waterfront development is closely correlated with the destruction of these natural structures. Hoyle (2002) also explained that it is important to improve the quality of the built environment in the heart of the traditional town, building in the long-established relationship between the city and the sea. This means a quality improvement effort in water environment areas is expected to improve the quality of life for the residents based on the concept proposed by Garcia et al. (2015) that the project concept is to utilize empty spaces, in all lake waterfronts, for the construction of public toilets and showers introduction of the electric boat and bike rental for sightseeing. This shows that a water-based settlement is the result of adaptation by a settled community. However, behavioral adaptations are reflected in different patterns of activities and daily life cycles, functional adaptations are indicated by the activity space zone or separation of dry land and water spaces along with their utilization, and structural adaptation is reflected in the physical-spatial arrangement of the residential environment as indicated by the aspects of layout, orientation, and residential buildings contextual to the dynamics of the water area as shown in Figure 2 and 3.

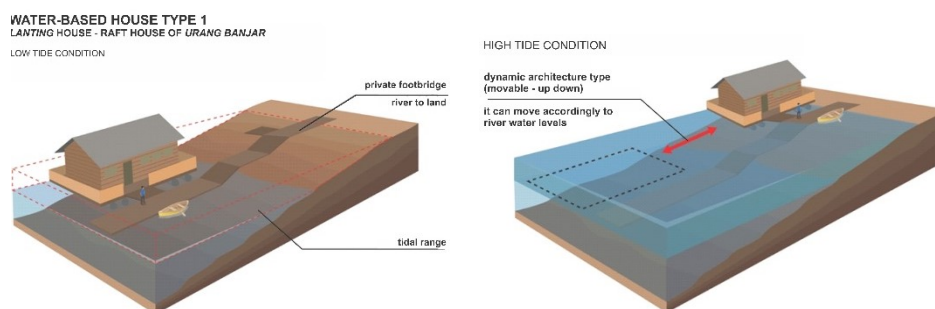


Figure 2. Space zone 1, water spaces (drawn by Achmad Sumirat)

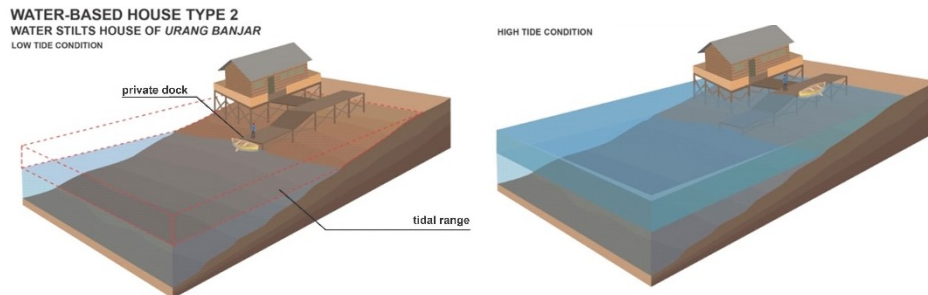


Figure 3. Space zone 2, dry lands (drawn by Achmad Sumirat)

This is in the form of a geometric patterned network resembling a spider's web or considered to be radio-centric with a linearly planned shaft. This design was made by J.J. Meijer in 1880 and the construction was completed by W. Broers in 1890. Moreover, Wijanarka (2008) explained the 5 types of road and canal networks developed by the Dutch East Indies government to include (a) Type 1 which is a One-sided Canal Flanked by Roads, (b) Type 2 which is a One-sided Canal Flanked by Land and Road, (c) Type 3 which is Two canals flanking the road on the outer side of the land, (d) Type 4 which is One side canal flanked by two roads, and (e) Type 5 which is One side canal flanked by two lands. This development is a sign of environmental engineering which is considered an important barometer to adapt the influence of Western technology and at the same time providing resilience to water-based living cultures as indicated in Figure 4.

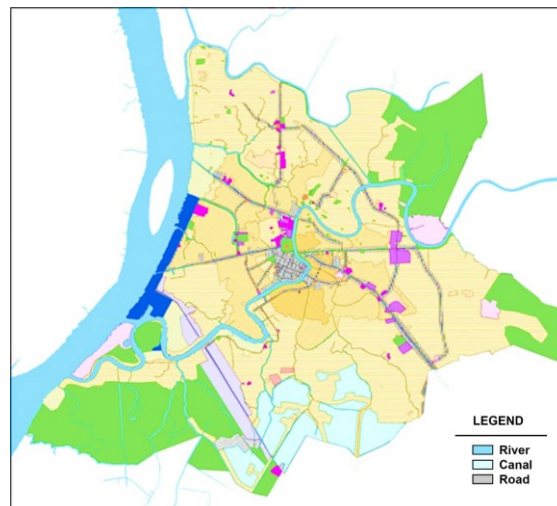


Figure 4. River, Canal and Road Network in Banjarmasin City Structural Planning
 (Source: BAPPEDA Kota Banjarmasin, 2009)

The settlement is, however, laid out in a linear form following the direction of the river and it consists of the following sections as described by Kusliansjah (2015).

A) Settlement

1. The floating house (lanting)

Floating houses are called *lanting* because they are floating on the river surface. They usually perform mixed-function of a residence and business place. The collection of *lanting* houses has a cluster pattern and the residents usually use a wooden walkway to land while getting to the boat using the pier. Moreover, the structure is made permanent in one place through the use of post moorings on the riverbank but has the ability to move to another place following the river flow.

2. Stilt houses which are partly above water and partly on land

The first type of stilt house is located on the riverbank and has direct access to the river using the pier and the mainland using a wooden walkway. The floor surface is located above the river water level and the house is constructed to have the ability to adjust to the tidal dynamics of river water. The largest type is the *Bubungan Tinggi* which is generally used for the king's residence. Moreover, the stilt house is usually constructed with due regard for the condition of the natural environment which is dominated by wetlands, mud, and swamps. The stilt house reflects the local wisdom of the community and its adaptation to a water-based environment.

3. Stilt houses located on land

The second type of Stilt house is usually located on land to reflect the balance between the left and the right (*Cacak Burung*). The floor height of this type of house from the ground level is approximately 2 meters. The residential layout reflects the adaptation of residents to activities conducted both on the water and land as observed from the separation of wet and dry areas, dirty and clean rooms, and the reflection of the balance between the left and right (*Cacak Burung*) as shown in Figure 5.



Figure 5. Stilt Houses (source: drawn by Achmad Sumirat)

B) Economic Activity

The strategic position of the city in the lower reaches of the *Barito* river makes it a center of trade and potential international port on the Kalimantan island. The largest trading commodities observed in the area include forest and mining products and trading activities have been identified to be that basic factor for economic growth in the city. The other typical economic activities discovered in the city include traditional markets such as the floating market at the mouth of the *Kuin* river where buying and selling take place on water using boats.

C.) Urban Planning Challenges

The developmental efforts of the New Order government era have changed the face of Banjarmasin city (Subiyakto 2005) and this is majorly due to the fact that economic policies influence urban development. Moreover, infrastructures and transportation facilities are being constructed to distribute oil and mining products at the port with the road between the cities and provinces observed to be prioritized (Subiyakto 2005; Kusno 2000). This is, therefore, encouraging the development of road-oriented settlements due to the easier access and increased mobility between cities and provinces. The increasing use of roads for human mobility and economic activities is gradually reducing the dominance of the river's function as the main transportation network (Subiyakto 2005). Moreover, the continuous investment growth driven by large-scale trade and export-import of mining products involving national and international economic networks requires adequate facilities to support business activities and this is making the settlements along the road to become denser (Andini 2011).

This phenomenon is also contributing to the increase in the city density, thereby, affecting the availability of land to settle and this has led to the non-

consideration of residents' proximity to rivers during residential land expansion. Therefore, several parts of the rivers and canals are being narrowed, thereby, causing the closure of water flow (Andini 2011). Moreover, the shift in the economy and work orientation from agricultural and river-based economies to land-based activities is slowly moving people away from dependence on rivers. This means the significance of rivers in people's lives is decreasing as evident in the reduction in the number of *lanting* and stilt houses. The decentralized system implemented in the country in 2001 has caused changes in governance and development finance and this also led to increasingly influential global economic power challenges to Banjarmasin city (Geenen & Derden 2013). The massive global economy has put pressure on the economy and river-based development such that the urban economy previously dominated by rivers and agriculture has been displaced by an economy based on profit, capital, and land speculation. This pattern has triggered the growth of development and physical projects in the form of property and real-estate development, spreading sporadically on different scales both inside and outside the city without considering the existence of rivers. This means the architecture adopted in these projects generally mimics the modern architecture and this has led to the abandonment of floating and stilt houses partly built above the river level (Cynthia 2018) as shown in Figure 6.



Figure 6. Road-Oriented Settlement Transformation/Land Based due to Urban Planning (bottom) and before (top) (drawn by Yustina)

The regulation of the Minister of Public Works and Public Housing No. 28 of 2015 concerning the safeguarding of rivers and surrounding environment with river boundaries also encourages Banjarmasin City Planning not to place rivers as the main infrastructure to be synergized with water-based settlements. However, the medium- and long-term development agendas which place rivers as the main component of the development program are required to ensure the sustainability of water-based settlements in the future and to avoid the displacement of life based on water and agricultural economy by land-oriented development. The Government Regulation of Indonesia No. 26 of 2008 concerning the National Spatial Plan showed Banjarmasin City as a National Activity Center due to the fact that it is the gateway to areas in the southern part of the Kalimantan island and also developed as a core city in the Metropolitan Area. This, therefore, means the city needs an integrated use of urban space. It is also important to note that the city development is centralized with reference to the Laws and Government Regulations and this has caused an urban planning overlap without considering the environmental context. For example, the obligation to implement the Spatial Planning Law is constrained by the physical conditions as indicated by the domination of the city by water areas. This means attention needs to be placed on these challenges in order to ensure continuous support for the sustainability of water-based settlements in urban development. The observable challenges from the analysis are, therefore, stated as follows:

- a. There is an increasing need for land for settlements in line with population growth.
- b. Urban settlement development tends to be land-based.
- c. Increased transformation of water-based settlements to land-based settlements.
- d. Transformation of land use from agricultural purposes to settlements.
- e. Floating and stilt houses are increasingly marginalized and are less attractive to the public.
- f. The implementation of the river boundaries policy is limiting the development of floating or lanting and stilt houses.
- g. The distance between buildings along the river banks tends to be tighter and observed to be blocking the viewpoint to the river.

The conditions of the rivers and canals are also described as follows:

- a. The river water becomes brackish and salty in the dry season due to seawater intrusion.
- b. There is river degradation, high silt sedimentation, and riverbank erosion.
- c. The river space has turned into a backyard and the reduction of water-based settlements is decreasing the quality of urban rivers due to the changes in their function.

- d. The width of most of the rivers, especially *Martapura*, *Alalak*, *Kuin*, has been narrowed by buildings and public facilities.

CONCLUSION

The conclusions from the analysis are stated as follows:

- a) The formation of an environmental structure as a form of residents' adaptation to the water area has existed before the colonial era and this is indicated by the familiar water culture among the people of Banjarmasin.
- b) The modernization during the colonial era created a combination of local and Western technology in the Banjarmasin city development
- c) The development orientation towards land started since the city experienced centralized development in the New Order era up to the present time and it was triggered by the growth of modern industry and trade which replaced agriculture.
- d) The city development has focused more on river balance by applying river boundaries since the enactment of the Spatial Planning Law.
- e) The river forms the structure of the city and water-based architecture characterizes the building pattern of the water or waterfront city.
- f) A floating house has the potential to be developed based on the fact that it is a product of the adaptation and resilient settlement architecture in the water area. It was also observed that the existence of floating and stilt houses supports the uniqueness of the waterfront city.
- g) The river spatial development policies need to explore the adaptation and resilience of river settlements as a local brand identity for the city. This means the development of human life civilization and the challenges of changing the river environment ecosystem require the need for regulatory systems and technological innovations which are able to provide resilience in the water-based settlement.
- h) The floating building is expected to be a solution for future development due to its ability not to damage the ecosystem. The architecture can be also developed into floating settlements and cities as a long-term technological innovation to solve urban environmental problems based on water.
- i) The importance of controlling the spatial and cultural transformation of water-based settlements in urban development is to maintain resilience for future generations.
- j) The development of civilization in human life and changes in the water-based environmental ecosystem in the Banjarmasin city in the present era has encouraged the need for water-based settlements to become city assets or heritage which are preserved as the brand identity.
- k) The concept of "living with water" is a technological innovation challenge for water settlements which reflects a strategy in water spatial planning and development of water-based cultural adaptation.

- 1) Urban planning in Banjarmasin City, which tends to prioritize road construction, has led to the rapid transformation of residential areas from river to land-oriented. This phenomenon causes a change in the culture of life, from a water-based to a road/land- culture.

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THE BEHAVIOUR OF HOUSEHOLDS TOWARDS ELECTRICITY CONSUMPTION: A CASE STUDY AT SEREMBAN

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Abstract

Understanding energy consumption behaviours among households is an effective way to encourage energy conservation and improve energy efficiency. This article examines households' knowledge, awareness, commitment, attitude, and behaviour towards electricity consumption. The sample of the study consists of 360 urban households in an intermediate city, Seremban. The findings reveal that cost-saving via government initiatives is a crucial factor influencing the households' energy consumption knowledge. The correlation analysis also revealed that knowledge, awareness, commitment, and attitude correlated significantly with the households' electricity consumption behaviour. The evidence suggests that the government and power companies implement strict regulations and technological advances to promote energy conservation and improve energy efficiency among households. The findings can better understand where attention should be directed and the measures for long-term energy conservation, climate change mitigation, and sustainable development.

Keywords: Household; behaviour; electricity consumption; knowledge, awareness, commitment, attitude

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INTRODUCTION

Households were considered as the most significant electricity consumers. Household electricity consumption was influenced by various factors, such as socio-economic profile, housing characteristics, and appliances' ownership (Permana et al., 2013). A recent study by Yalcintas and Kaya (2017) focused on the roles of income, price, and household size on residential electricity consumption in Hawaii. Chen (2017) found that gross domestic product (GDP), employment rates, residential space, and energy labeling scheme significantly influenced residential electricity consumption in Taiwan. Households are considered significant contributors to greenhouse gas emissions; their electricity consumption has led to global warming due to a complex series of interactions between socio-economic, dwelling, and appliances ownership in electricity consumption.

As in Peninsular Malaysia, the domestic users represented approximately 82% (total 7.8 million) of the total electricity consumption (Rahman et al., 2017). Household electricity consumption per capita in Malaysia rapidly increased from 626 kWh/person in 2000 to 4549 kWh/person in 2016 (Energy Commission, 2021). The electricity sector depends mainly on fossil fuel resources, such as diesel, coal, and natural gas (accounting for 77.27% or 23,518.10 MW) (Yong et al., 2019). While large-hydro power contributes to electricity generation around 18.78% (5716.10 MW), only 3.96 per cent (1205.20 MW) is derived from renewable energy sources, such as biomass and biogas solar. The electricity sector has produced a significant emission from their power plants because burning fossil fuel produces greenhouse gases such as CO₂, SO₂, and NO_x.

Behavioural change towards the green approach is vital to reduce environmental problems and energy consumption. Therefore, understanding household consumption behaviour is an effective way to encourage energy conservation and improve energy efficiency. Consumer behaviour is an essential issue in household energy consumption. Accordingly, this study examines households' knowledge, awareness, commitment, attitude, and behaviour towards electricity consumption, using the Seremban as a case study. This paper also focuses on assessing the relationship between knowledge, awareness, commitment, attitude, and behaviour towards electricity consumption. The empirical findings may facilitate a better understanding of where attention should be directed and the measures for long-term energy conservation, mitigation of climate change, and sustainable development.

MATERIAL AND METHODS

Survey Design

A quantitative study was conducted to analyse the behaviour of households towards sustainable electricity consumption in a rapidly growing city. The questionnaire, divided into five sections, comprises 27 items. The questionnaire seeks the respondents' socio-economic profile and knowledge, awareness, commitment,

attitudes, and behaviour towards electricity consumption. A seven-point Likert scale was employed to produce a high correlation and *t* value and suitability to study the electric and electronic distribution and consumption. The seven-point Likert scale also provides multiple options, allowing respondents to make a better choice for the items given. Skewness and kurtosis were run to ensure the normality of the distributed data. The value for normal distribution must be greater than 1.96 or smaller than -1.96.

Sampling Methods and Data Analysis

The study was conducted in Seremban, a city facing a dense population and rapid urban development due to its location within the Kuala Lumpur Corridor (KLK). The samples were classified according to the type of house, i.e. single-story terrace, double-story terrace, flat, village house, or bungalow (Table 1). A household was chosen as a research unit. The questionnaires were distributed to 620 respondents, but only 400 questionnaires were returned (a 64.51% response rate). In the first stage, descriptive statistics were applied to identify the households’ knowledge, awareness, commitment, attitude, and behaviour towards electricity consumption. A Pearson correlation was used to analyse the linear association between the independent and dependent variables. All the variables were treated as continuous variables.

Table 1 Samples Distribution

Types of Houses	Number of Area	Units	Percentage	Total Sample
Flats	8	3,385	3%	15
Traditional/Village	19	3,320	3%	20
Single Story Terrace	147	54,960	51%	196
Double Story Terrace	69	25,602	24%	91
Detached	26	10,851	10%	38
Bungalow	36	9,654	9%	40
TOTAL				400

RESULTS AND DISCUSSION

Table 2 presents the profile of the respondents. From the total number of respondents (400), 140 are male, and 260 are female. Most of the respondents (40%) were between the age of 30 to 39 years. About 26% of the respondents were above 50, and 18.5% were between 40 to 49 years. Most of the respondents are Malay (83%), and the rest are of other races. About 81.3% of the respondents are married, and only 14.8% are single. Seventy-three per cent (73%) of the respondents work in the government sector, and 13.8% of respondents work in the private sector.

Table 2: Demographic Characteristics of the Respondents

		Frequency (N=400)	Percent (%)
Gender	Male	140	35
	Female	260	65
Age	20 -29	42	10.5
	30-39	180	40
	40-49	74	18.5
	50 Above	104	26
Races	Malay	332	83
	Chinese	36	9
	Indian	24	6
	Others	8	2
Marital Status	Single	59	14.8
	Married	325	81.3
	Duda	3	0.8
	Single mother	13	3.3
Job	Government	292	73
	Private	55	13.8
	Self-employed	17	4.3
	Others	36	9
Monthly Household Income	500-1000	17	4.3
	1001-2000	49	12.3
	2001-3000	83	20.8
	3001-4000	87	21.8
	4001-5000	59	14.8
	5001 Above	105	26.3

Knowledge, Awareness, Commitment, Attitudes, and Behaviour towards Electricity Consumption

Psychology and behaviour are essential in determining household energy consumption and conservation. This study examines the households' knowledge, awareness, commitment, attitude, and behaviour towards sustainable electricity consumption in Seremban. Knowledge is a well-known cognitive factor (thinking ability) and a significant contributing factor to constructing a social structure and creating awareness. As indicated from the analysis, the mean score for all the knowledge items towards electricity consumption was moderate, except for rebates saving electricity ($M=5.79$, $SD=1.13$). This finding suggests that the respondents only have a moderate level of knowledge of energy-saving and environmental problems, such as greenhouse gas emissions and climate change. The respondents in the current study have a high level of knowledge of electricity consumption concerning saving money. In addition, most of them appear to have adequate knowledge of the government's rebates for saving electricity (those who consume electricity below RM20) until the end of December 2018.

In Malaysia, about 960,000 consumers from the lower-income group (those who use electricity below 91kWh or whose bill is below RM20 a month) enjoy free electricity (Basir et al., 2012). On 1 January 2019, the Malaysian government launched the RM40 Electric Bill Rebate Programme to replace the RM20 Electric Bill Rebate Programme. The government has allocated RM80 million for a monthly electricity bill rebate of RM40 for 185,000 domestic consumers from the lower-income group registered with the E-Kasih programme. The findings conclude that cost-saving via government initiatives is vital in influencing energy consumption knowledge among households. An electricity tariff is the amount of charge set aside by a supplier for consuming electric power for different types of customers. The tariff includes the overall cost of generating and supplying electric power at a reasonable price. In Malaysia, TNB electricity tariffs and supply voltage level classification typically depend on business activity, such as street lighting, domestic, commercial, industrial, mining, and specific agriculture. Domestic tariffs are divided into three categories: (a) 200 kWh (1–200 kWh) per month at 21.80 cent/kWh; (b) 800kWh (201–1000 kWh) per month at 28.90 cents/kWh; and (c) over 1000 kWh onwards per month at 31.20 cents/kWh (Rahman et al., 2017). As indicated from the current analysis, the mean score for awareness for change of electricity tariff was moderate ($M=4.08$, $SD=1.76$). Most of the households were less aware of the changes in electricity tariff.

Through the Feed-in Tariff (FiT) mechanism scheme, Malaysia has 528.06 MW of renewable energy installed capacity, which is relatively low compared to the tariffs in neighbouring countries such as Vietnam (2569 MW), Indonesia (3833 MW), and Thailand (6766 MW) (SEDA, 2019). According to Oh et al. (2010), energy demand is expected to increase by 1.2 per cent to 1.5 per cent for every one per cent growth in Malaysian GDP. This demand is rising due to the country's high economic development rate. Currently, enough electricity can be produced from fossil fuel resources (nonrenewable energy), but in the long term, fossil fuels are finite and will become costly due to their depletion. Therefore, alternative energy sources need to be considered, particularly renewable energy sources and green technology applications, to resolve multiple issues and dilemmas. Such considerations can be beneficial for present and future sustainable energy generation in Malaysia. As found in this study, the households still have moderate awareness of enough electricity supply and incentives to promote energy savings ($M=5.02$, $SD=1.31$, and $M=4.90$, $SD=1.49$, respectively).

The rapid economic and social growth has led to increasingly high energy demand in Malaysia following significant household energy consumption. Household energy consumption has contributed significantly to severe environmental problems. Substantial efforts have been made in research and development (R&D) on energy-efficient technologies to conserve household energy consumption and reduce environmental pressures. Reducing energy demand and improving energy efficiency are widely accepted, least expensive, and

quick to reduce environmental stress and climate change (Fong et al., 2008). Although technological advancements are critical to increasing energy efficiency and promoting energy conservation, the commitment of electricity consumption factors has been recognised as significant for energy conservation. As indicated from the current findings, the mean score for willingness to buy energy-efficient equipment and willing to limit energy consumption electricity was moderate ($M=5.22$, $SD=1.31$ and $M=5.66$, $SD=1.13$, respectively). On the other hand, the households' willingness to reduce electricity consumption to preserve the environment is still high ($M=4.71$, $SD=1.45$). However, the households' interest in volunteering to raise awareness of electricity consumption and saving is moderate ($M=4.71$, $SD=1.45$). According to Teoh et al. (2020), while the public is aware of the solar energy option, they are unwilling to install solar photovoltaic panels due to the high installation costs and lack of information. Harms and Linton (2016) found that consumers are unwilling to buy energy-efficient electrical appliances due to high prices. In another study by Hast et al. (2015), they found that consumers' confusion and lack of information had hindered them from buying energy-efficient electrical appliances. Correspondingly, the households in the present study were found to have a low commitment to using energy-efficient equipment, which they considered costly. Other contributing factors were also their lack of information and environmental concerns. Those with significant environmental concerns would be more likely to buy energy-efficient appliances when encouraged.

The mean score for all the items regarding attitudes of consumption of electricity was high. Many households were aware of saving electricity to protect the environment ($M=5.94$, $SD=1.03$) and reduce electricity tariff ($M=6.15$, $SD=1.01$). In contrast to earlier findings, no significant direct effect was found between environmental conservation attitudes and electricity consumption (Jones et al., 2015). As in the current study, most households also agreed that they are aware of controlling electricity consumption in their home ($M=5.99$, $SD=0.89$). These findings are consistent with Kavousian et al. (2013), who found households' awareness of the need to control electricity consumption, such as buying energy-efficient air conditioners and turning off lights when not in use. In other words, households consist of awareness of climate change concerns, monitoring energy consumption, and green attitudes.

The costs of household electricity depend on family members, living-lifestyle, number and age of electrical appliances, and the hours of using the electrical appliances. Most of the households surveyed felt that limiting electrical goods can save electricity ($M=5.94$, $SD=1.01$); they were aware of electrical appliances with energy efficiency labels in Malaysia. Household electrical appliances are the largest energy consumers in Malaysia. The energy efficiency label was certified by The Energy Commission of Malaysia in 2006. Manufacturers of electrical appliances (such as domestic refrigerators, domestic fans, television,

air conditioners) need to fulfil the energy performance test standards and requirements for the star rating established by the Energy Commission. The energy efficiency label informs consumers of the predictable energy consumption of each electrical equipment based on the energy efficiency rating system. A one-star label indicates the least energy-efficient, and a five-star label is the most energy-efficient. The star rating system is a simple way for consumers to identify and select the most energy-efficient products on the market. For example, five-star-rated electrical equipment will reduce electricity consumption and better savings in the long run. This equipment also mitigates the carbon footprint from electricity generation and promotes a better quality of life with more efficient appliances. According to Ward et al. (2011), electronic appliances with the energy-star service mark usually consume 20–30% less energy than required by federal standards.

According to Aldossary et al. (2014), energy consumption behaviours towards green can reduce domestic energy consumption by 10–30%. Findings from the current analysis indicate that the mean score for electricity consumption behaviour was high except for one item in the questionnaire. Three dimensions can describe a household’s energy consumption behaviour: time dimension, user dimension, and spatial dimension. In the time dimension, a household’s energy consumption can be defined in various time granularities, such as an hour, a day, a month, or even a year. In the user dimension, energy consumption behaviours are influenced by multiple internal factors (such as habit and environmental awareness) and external factors (such as housing characteristics and working conditions). In the spatial dimension, a household’s energy consumption behaviour would influence the different residential districts, economic development, building structure, climate characteristics, and other factors. The findings suggest that most households would constantly turn off electrical appliances when not in use or before leaving their house (M=6.22, SD=0.94, and M=6.24, SD=0.94, respectively). Most households agreed to use or buy electrical appliances to save energy (M=5.82, SD=1.07 and M=5.86, SD=1.03, respectively). However, most of them agreed that they lack information about the consumption and saving of electricity (M=5.53, SD=1.14). This study finding suggested that sufficient information is required for consumers to take action to conserve energy. Information on environmental issues (such as carbon emissions, climate change) and efficient appliances will encourage electricity consumption towards sustainability and improve energy efficiency. Table 3 presents the overall results.

Table 3: The Behaviour of Household towards Sustainable Electricity Consumption

Construct	Items	Mean	SD	Interpretation
Knowledge of the Consumption of Electricity				
1	I understand that the use of electricity will lead to climate change.	5.37	1.31	Moderate
2	I have a high understanding of the sustainable use of electricity	5.27	1.17	Moderate

3	I understand that consumers' use of electricity will release pollutant gases	5.22	1.18	Moderate
4	I have an understanding of electrical appliances that save energy	5.57	1.03	Moderate
5	I understand that the government provides rebates for saving electricity, particularly for the use of below RM20	5.79	1.13	High
Awareness of Electricity Consumption				
6	I am aware that the electricity tariff rates in Malaysia does not change.	4.08	1.76	Moderate
7	I am aware that the electricity supply in Malaysia is enough	5.02	1.31	Moderate
8	I am aware that TNB provides interesting incentives to promote energy savings	4.90	1.49	Moderate
Commitment of Electricity Consumption				
9	I willing to buy energy-efficient equipment even though the equipment is expensive	5.22	1.31	Moderate
10	I am interested in volunteering to raise awareness among the public about the consumption and saving of electricity	4.71	1.45	Moderate
11	I am committed to participating in the campaign of electrical energy awareness	5.06	1.25	Moderate
12	I just bought electrical appliances that save energy	5.37	1.17	Moderate
13	I will reduce electricity consumption to preserve the environment.	5.68	1.03	High
14	I am willing to limit energy consumption electricity in residence.	5.66	1.13	Moderate
Attitudes of Consumption of Electricity				
15	I need to save electricity because it is essential to protect the environment	5.94	1.03	High
16	I have a high awareness in controlling the use of electricity in my home	5.99	0.89	High
17	I feel that limiting electrical goods can save electricity	5.94	1.01	High
18	I agree that the electricity tariff rate should be reduced	6.15	1.01	High
19	Electricity consumption outside peak hours is the best method to save costs and energy	5.79	1.12	High
Behaviour of Electricity Consumption				
20	I always turn off electrical appliances when not in use	6.22	0.94	High
21	I use an electrical appliance to save energy	5.82	1.07	High
22	I always reduce energy consumption electricity	6.00	0.97	High

23	I bought energy-saving equipment to reduce electricity consumption.	5.86	1.03	High
24	I will make sure all electrical appliances are turned off before leaving the house.	6.24	0.94	High
25	I always remind family members to save energy consumption.	6.18	0.89	High
26	I always practice saving behaviour at the house.	6.23	0.87	High
27	I always get information about consumption and saving of electricity.	5.53	1.14	Moderate

Direct and Indirect Relationship towards Electricity Consumption

Pearson correlation was employed to investigate the relationship between the independent and the dependent variables (Table 4). We tested the score of knowledge, awareness, commitment, and attitude as the independent variables, while behaviour scores towards electricity consumption as the dependent variable. From the analysis, we found that the scores of knowledges, awareness and household commitment are positively correlated. The commitment was found to have the most significant correlation coefficient ($r = 0.506$ $p < 0.01$), followed by awareness towards knowledge of households ($r = 0.398$ $p < 0.01$). The attitude was found to correlate with behaviour ($r = 0.750$ $p < 0.01$) significantly. These findings suggest that the households who expressed a positive attitude were more likely to engage in a positive behaviour towards electricity consumption than those who did not have a positive attitude.

The current study suggests that a person's positive behaviour towards electricity consumption relies heavily on his/her positive knowledge, awareness, commitment, and attitude. These findings corroborate Rahman et al. (2017), who found a positive correlation between knowledge and awareness to implement an energy-efficient approach for using electrical appliances among households. Also found in the present study is that the electricity consumption in Seremban depends highly on the households' level of knowledge and commitment.

Table 4 Direct and Indirect Interaction of Variables and Electricity Consumption (kWh)

	Knowledge	Awareness	Commitment	Attitude	Behaviour
Knowledge	1				
Awareness	0.398**	1			
Commitment	0.506**	0.451**	1		
Attitude	0.506**	0.284**	0.511**	1	
Behaviour	0.531**	0.257**	0.502**	0.750**	1

** Significant at 0.01 level (2-tailed)

*Total electricity consumption per month (kWh/month)

CONCLUSIONS

This study has highlighted the complexity of household energy consumption by investigating households' knowledge, awareness, commitment, attitude, and behaviour. The households were found with low commitment to using energy-efficient appliances due to the high cost compared to non-energy-efficient appliances, despite environmental concern. Cost savings via government initiatives were also found to influence energy conservation among households. The finding suggests that the government and power companies should enforce regulations and technological advances to promote energy conservation and improve energy efficiency among households. For example, increasing renewable energy (biomass, biogas, and solar) as alternative energy that is less dependent on fossil fuel is one of the best approaches to reducing greenhouse gas emissions and creating long-term sustainable energy consumption. The findings also suggest that the government and power companies consider consumers' economic status and lifestyle as these factors are closely related to their energy behaviours. For example, electricity consumption will increase as family members grow; more appliances will be used, and longer usage will occur, including less-efficient appliances. Also, most households felt that limiting electrical goods could save electricity and consider having electrical devices with the Malaysian energy efficiency label. The implication is that the government and power companies should encourage households to highly energy-efficient electrical appliances based on the energy star rating to conserve energy.

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THE FACTORS AFFECTING THE WELFARE OF STREET VENDORS IN INDONESIA

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Abstract

This study aimed to examine how the welfare of street vendors is influenced by education, financial capital, geographical distance, and social networks. A mixed-method approach that combines both quantitative and qualitative methods was used. The results showed that the welfare of street vendors is at a low level and is simultaneously influenced by education, financial capital, geographical distance, and social networks with a determination value of r-square (r^2) of 0.783 or 78.3%. However, there is a need for further and in-depth studies on the influence of geographical factors and social networks on the welfare of street vendors, especially on geographical factors with a significant influence on welfare.

Keywords: Geographical Distance; Social Networks; Welfare; Financial Capital; Street Vendors; Education

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INTRODUCTION

The informal sector has a significant contribution to the economic order, though its businesses are not officially registered, irregular, and poorly organized (Rothenberg et al., 2016; Stuart et al., 2018). Since the activities of this sector are not recorded in the official government statistics or covered by state regulations and taxes, it refers to a shadow economy (Horn, 2018; Mróz, 2018; Rei, 2008). Furthermore, it is also referred to as the underground economy because it is characterized by limited legal activities (Feige, 1990; Losby et al., 2002; Petrova, 2018). The informal sector comprises people with a low level of education, invalid business license, no specific hours for operating, inappropriately organized, and poor business actors (Charmes, 2012; Mitullah, 2003; Mukherjee, 2016; Portes et al., 1989; Stuart et al., 2018).

Although the shadow economy is a source of livelihoods to millions of people and represents a "safety net" for most poor individuals and families, the adverse effects on the economy and society significantly exceed its positive impact (Camacho et al., 2017; Golubovic & Dzunic, 2015). However, it can provide a sustainable livelihood for urban communities when appropriately managed (Ruzek, 2015).

The shadow economy has a significant link to the formal sector. For instance, it helps in marketing the formal economy's products and sells daily household items, such as school supplies, cosmetics, and drinking water (Bromley, 1978; Khasnobis et al., 2006). The supply and marketing chain stimulates economic growth in urban areas, though the role of Street Vendors is not recognized.

A street vendor is an entrepreneur with sufficient capital for production activities and offers goods for sale to the public without a permanent built-up structure for transactions. Street vendors are often stationary and occupy spaces on the pavements or other public and private spaces. Furthermore, they may be mobile and move to different places, carrying their wares on pushcarts or baskets (Bhowmik, 2005). They participate in the production and selling of goods and services to fulfil the needs of consumers. However, the respective activities occur in places that are strategic, economic, and informal environments.

Like other big cities in Indonesia, Semarang faces the problem of urbanization, including many street vendors. They are very observant in utilizing the remaining public spaces, such as the sidewalk and a small road shoulder. Furthermore, the vendors are good at exploiting opportunities and often consider the strategic locations between residential and educational place. This has made them creative in utilizing spaces for their activities or hawking wares.

According to previous studies, educational background, financial capital, geographical distance, and social networks significantly influence the overall welfare of street vendors, including income (Anggraini, 2019; Harahap, 2017; Ifotania, 2010; Nurbaiti & Chotib, 2020; Setyaningsih et al., 2019).

Geographically, small business economic actors operate in urban centers with high economic value (Utomo et al., 2018).

This study conceptually examines the welfare of street vendors comprehensively. It has a novelty on street vendors since geographical and social network factors have not been used as a variable to examine welfare in Semarang. Specifically, this study examines the following problems:

- (1) The welfare of street vendors in Semarang.
- (2) The influence of education, financial capital, geographical distance, and social networks on the street vendors' welfare in Semarang.

LITERATURE REVIEW

Urbanization affects urban economic development (Rakhmatulloh et al., 2018). For instance, it has led to various informal sectors in Semarang city, with most immigrants selling food. The street vendors who sell food are called culinary street vendors and are found throughout Semarang. The rapid development of this metropolitan city has attracted street vendors currently scattered in the sub-districts. Both organized and unorganized street vendors occupy the public spaces. In general, the number of unorganized vendors surpasses the organized. According to Syariffuddin et al. (2017), 78% of vendors in Semarang are unorganized, and their number has significantly increased in the last ten years. Mobile street vendors usually use cars and three-wheeled or two-wheeled motorbikes found throughout the city. Essentially, they are significantly increasing due to their high mobility and can be found on the roadsides in almost all public spaces. They sell different kinds of vegetables, bread, snacks, drinks, fruits, rice, cooking oil, spices, other household necessities, clothes, credit for cellphones, motorcycle tires, satellite dishes, and plants.

Welfare is the goal pursued by street vendors, though difficult to achieve. It is significantly affected by various factors, including education, geographical distance, business capital, and social capital. Furthermore, it is affected by government policies or districts because of operating in the public spaces (Bromley, 2000). It is vital to examine the link between government policy and the welfare of street vendors, focusing on the concept of a prosperous country. This concept clarifies the kind of welfare state model that the Indonesian government implemented. The policies on survival and the welfare of street vendors are influenced by what the government considers. There are many approaches, paradigms, and welfare models applied by the government to organize people's lives.

The basic idea of the welfare state model comes from the strategy of managing resources for the welfare of the people and includes the liberal, corporatist, and democratic aspects (Andersen, 2012). The United States adopts the liberal welfare state model to formulate policies that allow people to obtain social insurance benefits, establish social safety nets, and care for the poor.

Moreover, this model was adopted by Germany to provide social insurance benefits to the public concerning work and income. In Sweden, it stipulates that social assistance is the mutual responsibility of both citizens and the state.

The government can improve the welfare of the people through social policies. Social welfare is conceived in three elements: how social problems are managed, needs to be met, and opportunities for advancement (Midgley, 1999). These three elements apply to individuals, families, groups, and communities.

The government is responsible for increasing income through investments both in the country and abroad. In general, investments, such as banking, property, hotels, agriculture, plantations, marine, trade, and oil and gas, are in the formal sector. The need for rapid economic growth is the main reason the government policies focus more on developing the formal economic sector.

The informal economic sector, which includes the small or retail trade like food and beverage, has not received much attention from the central and regional governments. However, the publication of the Presidential Regulation (Perpres) No. 125/ 2012 regarding the Coordination of Structuring and Empowerment of Street Vendors affects the future of street vendors. The Home Affairs Ministry Regulation (Permendagri) No. 41/ 2012 regarding the Guidelines for Structuring and Empowering of Street Vendors has also shifted government attention to registered or official street vendors than the unregistered ones. Nilakusmawati, D. P. E., Susilawati, M., & Wall, G. (2019) stated "the policy of empowerment of the program of street vendors by the government is not optimal". This is indicated by the number of unregistered vendors relocated or evicted from their selling places.

Social policies related to social welfare services should guarantee rights to all citizens, including the welfare of the street vendors. Therefore, the policies taken are not partially organized but comprehensively and empower street vendors by involving the state and society. They activate social welfare institutions by following the basis of the state philosophy, Pancasila.

Mostly, the previous studies focused on the influence of education, financial capital, geographic distance, and social networks on business success, also street vendors' welfare. These include knowledge and education influence on the success of informal sector traders (Karonido & Tumaini, 2021; Nirathron, 2006a). The effects of financial capital on the business continuity of street vendors (Gatere, 2016; Marliati, 2020), and the use of public space (geographic factors), and the survival of street vendors (Winter, 2017). In general, food vendors mostly sell near housing, transportation hubs, and workplaces (Rosales Chavez et al., 2021). Social networks also play an important role in determining the success and welfare of street vendors (El-Azzazy, 2019; Kebede, 2015; Mramba, 2015). Although several studies have been conducted on the welfare of street vendors (Giraldo et al., 2020; Nilakusmawati, D. P. E., Susilawati, M., & Wall, 2019), most of them did not focus on essential variables, such as education,

capital, and social networks. Specifically, they mainly focused on the partial relationship between variables. This study bridges the existing gap by focusing on education, financial capital, geographical distance, and social networks, the variables that influence the welfare of street vendors.

RESEARCH METHOD

This study used a sequential exploratory design and mixed methods that combine quantitative and qualitative to obtain complete, valid, reliable, and objective data (Creswell, 2014). A qualitative approach was used to describe the welfare of street vendors in Semarang (RQ1). In contrast, the effect of education, financial capital, geographical distance, and social network on the welfare of street vendors in Semarang (RQ2) was examined quantitatively. The unit of analysis is the street vendors trading in 13 study locations, as shown in Figure 1.

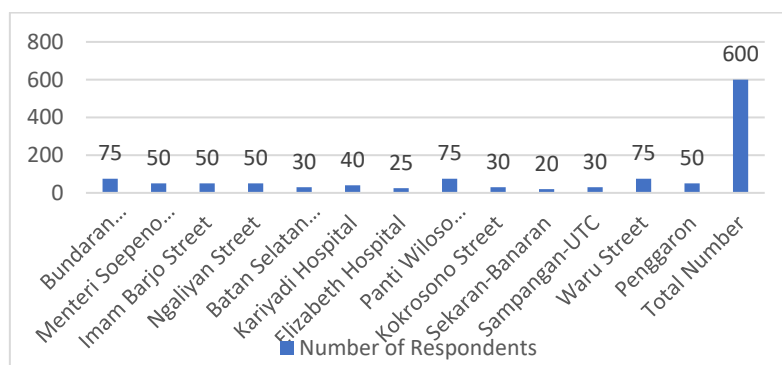


Figure 1. Distribution of Research Analysis Units

The sample was selected randomly by examining the proportion of the study location. A sample of 598 (rounded up to 600) was obtained from a population of 6000 with an error level of 1%. This included the Culinary and Non-Culinary Street vendors who traded in the respective locations for at least 1 year. Furthermore, the 13 study locations were selected based on the number of streets vendors. The largest samples were taken at the Simpang Lima Roundabout, Kokroso Street, and Waru Street.

Interviews and observation were used to collect qualitative data, while questionnaires were utilized to obtain quantitative data by giving respondents a set of questions or written statements. There was a questionnaire with five main variables, including education, financial capital, geographical distance, and social networks as independent variables and the welfare of street vendors as the dependent variable. Moreover, the data validity test was conducted through informant reviews and triangulation of the sources.

The qualitative data analysis techniques were used to answer the first problem (RQ 1) and included data condensation, display, and drawing and verifying conclusions (Miles et al., 2014). Similarly, quantitative analysis techniques were used to answer the second problem (RQ 2) with independent and dependent variables. Specifically, the independent variables influence the dependent variable, including education, financial capital, geographical distance, and social networks symbolized as X1, X2, X3, and X4. Contrastingly, the dependent variable was the welfare of the street vendors, symbolized as Y. The statistical analysis technique used was the multiple linear regression test. Before this test, linearity and significance were examined. The following formula was used to perform a multiple linear regression test.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_n X_n$$

Description:

Y = Dependent variable or response.

X = Independent variable or predictor.

α = Constant.

β = Slope or estimate coefficient.

Test rules significance:

a. F count \geq F table with a significant level of 5% (0.05), then Ho is rejected.

b. F count \leq F table with a significant level of 5% (0.05), Ho is accepted.

In calculating the regression test, researchers used the help of the SPSS program.

RESULTS

The Social Welfare of Street Vendors in Semarang

The social welfare related to the street vendors is interpreted as a condition where life necessities are met, including clothing, shelter, food, health, and interacting with the environment to improve their living standards. Social welfare is examined based on several indicators, including assets owned, savings of money deposit institutions, such as banks and cooperatives, investment ownership like deposits, gold investment, property business, securities, and investing in cooperatives/CV/PT/other joint ventures. The results show that the assets owned by street vendors in Semarang are categorized as shown in Figure 2 below.

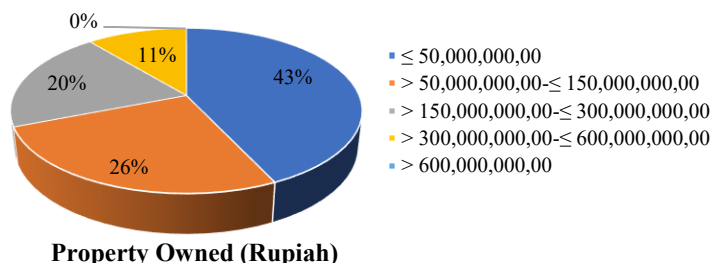


Figure 2. The welfare of PKL in Semarang City based on Total Assets Owned
 Source: Primary Data Processed, 2020

The street vendors in Semarang are classified into five main categories. The dominant category was for vendors with total assets of less than or equal to (\leq) IDR 50,000,000.00, specifically 257 (43%) respondents. Second, 158 (26%) had total assets of $>$ IDR 50,000,000 - \leq IDR 150,000,000.00. Third, 120 (20%) had total assets of $>$ IDR 150,000,000.00 - IDR 300,000,000.00. The fourth was a category had 65 (11%) respondents with total assets worth $>$ IDR 300,000,000.00 - \leq IDR 600,000,000.00. The last category had individuals with total assets worth more than ($>$) IDR 600,000,000.00.

The ownership of a certain amount of money saved in money-saving institutions, such as banks and cooperatives, was also used to examine the welfare of the vendors. In this regard, vendors were also divided into five distinct categories. The first had 238 respondents (40%) without any savings, while the second one had 256 (43%) with savings of less than or equal to (\leq) IDR 10,000,000. The third category had savings of $>$ IDR 10,000,000.00 - \leq IDR 30,000,000.00, specifically 69 (12%). The fourth one had 14 (2%) respondents with savings of $>$ IDR 30,000,000.00 - \leq IDR 50,000,000.00. The fifth category had 23 (4%) vendors with savings of more than ($>$) IDR 50,000,000.00.

The ownership of investments such as deposits, gold investment, property business, securities, stock investment in cooperatives/CV/PT/other joint ventures was also considered. A total of 547 respondents (91%) did not have any investment in the form of deposits, gold investment, property business, or other forms. Only 53 (9%) had 1 type of investment.

Based on the indicators of assets, total savings, and investment, street vendors had a low level of welfare. The data obtained showed that 43% had total assets less than or equal to (\leq) IDR 50,000,000, while 40% had no savings. Furthermore, 43% had savings of less than or equal to (\leq) IDR 10,000,000, while 91% did not have any investments in deposits, gold, property business, or other forms of property.

The Influence of Education, Financial Capital, Geographical Distance, and Social Networking on the Social Welfare of Street Vendors in Semarang

The data obtained were analyzed using IBM SPSS data processing software, with the social network, geographical distance, education, and financial capital as independent variables. The dependent variable was the welfare of the street vendors.

The statistical data processing showed that the correlation value (R) was 0.885. This was the percentage of the influence of the independent variable on the dependent one, also called the coefficient of determination (R^2). Specifically, the coefficient of determination (R^2) was 0.783. This means that the independent variables, including social networks, geographical distance, education, and financial capital, influenced 78.3% of the dependent variable. The remaining

21.8% was influenced by other factors outside the X variable to make the value of e to be = 100% - R² = 100% - 78.3% = 21, 8%.

Table 1. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.885 ^a	.783	.782	.4266
a. Predictors: (Constant), Social Network, Distance_Geography, Education, Financial Capital				

Source: Primary Data Processed through SPSS, 2020

The statistical calculations show that the calculated F value was 536.678, while the significance of probability was 0.00, smaller than 0.050. Therefore, education, financial capital, geographical distance, and social networks simultaneously influenced the welfare of street vendors.

From table 2, the regression equation of $Y = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \varepsilon$ or $Y = 2.143 + 0.302X_1 + 0.229X_2 + 0.232X_3 + 0.075X_4 + e$ was obtained. There was a constant of 2.143 and 0.302 as the coefficient of the effect of education (X1) on the Street Vendors Welfare. Furthermore, the regression coefficient of the effect of financial capital (X2) on Street Vendors Welfare was 0.229, while geographical distance (X3) on Street Vendors Welfare was 0.232. The influence of Social Networks (X4) on Street Vendors Welfare was 0.075.

Table 2. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Standard Error	Beta			
1						
	(Constant)	2.143	.143			
	Education	.032	.024	.359	12.519	.000
	Financial Capital	.229	.027	.291	8.471	.000
	Geographic Distance	.232	.019	.290	12.251	.000
	Social Network	.075	.017	.115	4.385	.000
Dependent variable: Welfare						

Source: Primary Data Processed through SPSS, 2020

The t value for education (X1) was 12.519 with a significance value of 0.000, smaller than 0.050. Therefore, education (X1) partially or individually influences the welfare of the street vendors. The t value for financial capital (X2) was 8.471 with a significance value of 0.00, smaller than 0.050. This means that financial capital (X2) partially or individually influences the welfare of the street vendors.

The t value for geographical distance (X3) was 12.251 with a significance value of 0.00, smaller than 0.050. Therefore, the geographical distance (X3) partially or individually affects street vendors' welfare. The t value for social networks (X4) was 4.385 with a significance value of 0.00, less than 0.050, meaning that social networks (X4) partially or individually affect the welfare of street vendors.

In the regression analysis output, the beta value of education was 0.359 while financial capital had 0.291. Furthermore, the geographical distance beta value was 0.290, while the social network had 0.115. Therefore, education (X1) had the highest beta value and significantly influenced the welfare of street vendors.

DISCUSSION

According to most government officials, street vendors are part of the informal sector that interferes with the beauty of the city (Batréau & Bonnet, 2015; Racaud et al., 2018). Furthermore, they create unfair competition for more established shop owners and reduce their profits by offering pirated and counterfeit goods (Forkuor et al., 2017). Some governments, such as Bangkok and Thailand, allow street vendors to run their businesses (Kusakabe, 2006). In Bangkok, they have developed as an economic entity and have succeeded in reducing poverty (Nirathron, 2006b).

Urbanization increases land values and economic growth and development (Marzuki & Jais, 2020). For this reason, most public spaces are occupied by traders, a major problem in developing countries (Brown, 2006). Generally, street vendors use public spaces to trade and market their products and have a significant turnover. In the last ten years, many traders with substantial capital have been realized in cities. The number of small traders continues to surge because their merchandise is often sold quickly.

The potential of street vendors and the entire informal sector cannot be underestimated. For instance, it offers employment opportunities and absorbs the workforce not accommodated in the formal sector (Cuevas et al., 2009; Tichelaar, 2015). The formal sector is pressured to provide decent wages and working conditions, promoting the informal sector (Nazara, 2010). Furthermore, the informal sector makes a positive contribution that enables the formal sector to survive by distributing goods (Mcintyre-mills & Romm, 2019). It is also a “safety haven” for the unskilled and poorly educated urban residents because it provides alternative sources of income, contributing to their survival.

Most street vendors come from the middle- and lower-class groups of society. During the Covid-19 pandemic, most business people went to the streets to market their products. The Pizza Huts businessmen and several bakers sent marketers to the roadsides to enhance access to buyers. PT. Telekomunikasi Indonesia (Telkom) also sends marketers to the streets to pick potential buyers.

This study showed that education, financial capital, geographical distance, and social networks influence the welfare of street vendors. Therefore, these individuals fight for their welfare because they have an entrepreneurial ethos and unyielding spirit. However, the welfare gains tend to be higher in case the government, through the pro-people policies, provides opportunities for them to run their business. These include issuing regulations that provide room for movement and empowerment as economic entities. The city government should prepare the areas that are accessible to the community for street vendors to trade safely and comfortably.

In case the land in urban areas is no longer usable, the city government should cooperate with investors from the formal sector to allow street vendors to trade in their places. Suppose this is not possible because the city is overcrowded, the government should regulate and organize existing public spaces to be used by the street vendors. This is in line with Roever & Skinner (2016), which stated that the poor urban residents, specifically street vendors, need to access the public spaces to run their businesses seamlessly. Additionally, government policies favoring street vendors will help to maintain their livelihoods sustainably (Assan & Chambers, 2014; Milgram, 2011; Patel et al., 2014; Timalsina, 2011; Uwitije, 2016).

CONCLUSIONS

This study established that street vendors in Semarang city: (1) have low welfare even though they can meet their daily living needs, (2) simultaneously welfare is affected by the education, financial capital, geographical distance, and social network. Therefore, the government should formulate appropriate policies that promote the survival of street vendors. Access to public spaces and institutions that are beneficial for a sustainable future of street vendors should be encouraged. Geographical factors and social networks have a positive effect on the welfare of street vendors, so further and in-depth studies are needed on the influence of geographic factors and social networks on the welfare of street vendors.

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URBAN LOW-COST HOUSING EFFECT MENTAL HEALTH

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Abstract

As the number of people moving to urban areas increases by the year, it also increases the prevalence of mental health problems worldwide. Low-income groups in urban areas have had to choose to live in low-cost housing due to the higher cost of living. This study aims to understand the effect of living in low-cost housing. The objectives are to study and analyse mental health conditions for the low-income group living in low-cost housing in an urban area. This study was conducted at the Federal Territory of Kuala Lumpur, Malaysia. The questionnaire used is an adaptation of the Depression, Anxiety, and Stress Scale (DASS-21), and the sample selection used homogenous sampling. The site selection is based on the housing scheme's characteristics: location, density, property age, and surrounding land use. The data collected were analysed using correlation analysis to determine the relationship between urban low-cost housing living and mental health. The results have shown that 57.8 per cent of the respondents have depression, 65.7 per cent have anxiety, and 55.9 per cent have stress with various severity. The findings show that low-cost housing associated with poorer mental health is caused by several factors.

Keywords: urban environment, density, mental, health

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INTRODUCTION

Mental disorders do not only affect adults but also adolescents and children. One may have mental health problems since childhood, and some due to several factors that caused them to experience mental health problems. According to the World Health Organization (WHO) (2020), almost 1 billion people are living with mental disorders and one person dies every 40 seconds by suicide. The COVID-19 pandemic impacted billions of people and worsened their mental health. The number of people with depression is 264 million, and anxiety disorders are around 284 million in 2017 worldwide (Ritchie & Roser, 2018). Females have a higher number of mental disorders prevalence compared to males. In Southeast Asian countries, Malaysia has the highest percentage of mental disorders, and the prevalence is increasing and worsening in the COVID-19 pandemic. Mental disorders could affect anyone, and more than one disorder at a time.

In most developing countries, people with mental disorders are among the most marginalised (WHO, 2010). Socioeconomic status may cause a higher prevalence of mental disorders in urban areas, living conditions, surrounding environment, and education level. Many studies found that people born and raised in urban areas have an increased risk of mental disorders (Hoisington et al., 2019). Urban living with a higher population density is associated with a greater incidence of mental health problems (McDonald et al., 2018). As the number of people moving to urban areas is increasing by the year, the rate of mental health problems in urban areas is also increasing in line with the number of populations. Urban areas offer a limited provision of housing, land, facilities, and green spaces, which could not suffice the increasing number of populations. This study aims to understand and study the effect of low-cost urban living on mental health. The objectives are to study and analyse mental health conditions for the low-income group living in low-cost housing in urban areas, focusing on the common mental disorders of depression, anxiety, and stress.

LITERATURE REVIEW

Built environment and health has been a topic of interest for nearly half a century. Recent studies on the relationship between the built environment and health are not only on physical health but also on mental health. However, the relationship between the built environment and mental health findings is still limited and conclusive. According to Tao, Yang, and Chai (2020) and Barros et al. (2019), the built environment of a neighbourhood gives a resident an initial feeling of safety and disorder, which can be an emotional response that can improve or harm residents' social wellbeing and mental health depending on their feelings. There are abundant studies that have found that a built environment can also become a determinant affecting the risk of mental disorders. Apart from this, socioeconomic conditions and mental health of the population also have one of the characteristics in the built environment that need to be included (Amone-P'Olak et al., 2009;

Beemer et al., 2019; Garrido-Cumbrera et al., 2018; Greif & Dodoo, 2015; Suglia et al., 2011; Xiao et al., 2018). The built environment also can, directly and indirectly, influence mental health (Evans, 2003).

Low-cost housing and mental health

Built environment consists of the physical environment and human-made features built for human use. Housing is an essential characteristic in the built environment where it is an essential requirement for shelter and people to live to work their daily life routines. In an urban area, the cost of living is higher, the land and spaces are limited, and most people could not afford medium and high-cost housing for a comfortable and better living due to their socioeconomic status limitations. Thus, the low-income group will reside in squatters or low-cost housing in the urban area, which is affordable. Housing with good housing conditions with sufficient space, higher housing quality, better housing quality, and strong housing affordability will create better mental health (Hoisington et al., 2019; Qiu et al., 2019; Wang et al., 2018). Singh et al. (2019) summarise that housing disadvantages, such as overcrowding, mortgage, delinquency, housing mobility, and housing tenure, can impact mental health.

Evans (2003) listed the direct effect of housing characteristics on mental health, such as house type, floor level, housing quality, and neighbourhood quality. Housing types, floor level, density, overcrowding and quality are associated with mental health (Marzukhi et al, 2020; Barros et al., 2019; Beemer et al., 2019; Ferguson & Evans, 2019; Qiu et al., 2019; Shenassa et al., 2007). Li and Liu (2018) derived a conceptual framework indicating that housing can cause perceived stress and mental health problems through housing and neighbourhood stressors, the housing cost burden, overcrowding, inadequacy of indoor facilities, housing instability, and physical and social deprivation. According to Feng and Astell-Burt (2018), housing conditions such as housing types, floor, and housing facilities can directly affect mental health and indirectly affect community satisfaction, such as neighbourhood relationships, which indirectly affects mental health.

Most of the studies find a relationship between housing and mental health. This study is essential to find evidence of mental health problems in low-cost urban housing and the factors that may cause it through housing characteristics.

METHODOLOGY

This study aims to study the relationship between low-cost urban housing and mental health, and the factors contributing to it. A questionnaire was distributed to the selected area of low-cost housing in the Federal Territory of Kuala Lumpur, Malaysia, specifically at Flat Hang Tuah and Flat Sri Selangor. This study was conducted before the COVID-19 pandemic outbreak in February 2020. The sample size (N = 102) is selected based on their availability at home and willingly participating in the survey. The sample selection uses the homogenous sampling

method in which the respondents have similar living locations. The selected area was based on housing characteristics: density, property age, location, and surrounding land use.

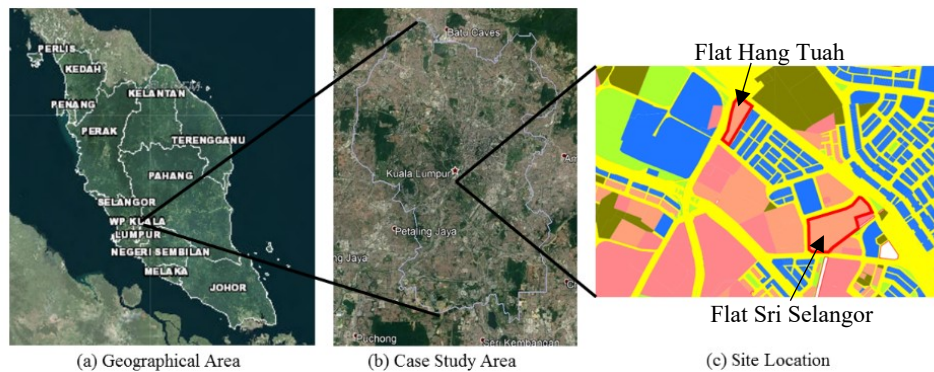


Figure 1: Location of Area of Interest

The questionnaire survey is divided into two sections: the respondent's demographic profile and the second section is the adaptation of the Depression, Anxiety, and Stress Scale (DASS-21). The first section consisted of the respondent's gender, age, citizenship, race, religion, academic qualification, employment status, household income, marital status, number of dependents, and homeownership status.

The second section consisted of evaluation scales adapted using the DASS-21 questionnaire, including the characteristics of the built environment and housing spaces to evaluate the factors contributing to mental health problems consisting of 23 questions. The evaluation scales responses consist of four answers: (1) "did not apply to me at all", (2) "applied to me to some degree, or some of the time", (3) "applied to me to a considerable degree or at a good part of the time", and (4) "applied to me very much or most of the time". DASS-21 questionnaire is a self-report scale designed to measure the states of depression, anxiety, and stress.

The statistical analysis is performed using the Statistical Package for Social Sciences Version 26.0 (SPSS) for the correlation analysis. The correlation analysis uses the Spearman analysis with a significance value set at $p < 0.05$ (one-tailed) to explore the relationship between low-cost urban housing and mental health.

RESULTS

The respondents answered all the distributed questionnaires accordingly, and no questionnaire returned incomplete. The respondents who took part in the survey were male (47.1%) and female (52.9%). The respondents' age ranged between 15

years old and above 65 years old. Most of the respondents were between 35 and 44 years old (23.5%). For the respondents' academic qualifications, most of them finished secondary school and are employed. The respondent's socio-demographic profile is reported in (Table 1).

Table 1: Respondent's socio-demographic profile

Variables	Percentage
Gender	
Male	47.1
Female	52.9
Academic Qualification	
Primary School	26.5
Secondary School	62.7
Higher Education	4.9
None	5.9
Employment Status	
Employed	47.1
Student	2.0
Housewife	25.5
Unemployed	25.5
Household Income (MYR)	
Below MYR1,000	61.8
MYR1,001 – MYR3,000	36.3
MYR3,001 – MYR6,000	2.0

States of depression, anxiety, and stress are analysed based on the self-reported scales of DASS-21. It is shown that 57.8 per cent of the respondents have depression, 65.7 per cent have anxiety, and 55.9 per cent have stress with various severity ranging from mild to extremely severe. More than half of the respondents have depression, anxiety, and stress from these results, and most of these people were not aware of the symptoms. Many factors may contribute to these mental health problems, and as stated in previous studies, it is shown that a built environment, such as housing, can have a direct effect on mental health (Evans, 2003).

Based on (Table 2), it is shown that depression and stress are mostly in a mild and moderate state; however, 25.5 per cent have severe and 15.7 extremely severe anxiety. According to the Mental Health Handbook (2019), anxiety refers to feeling worried, nervousness, fear, and apprehension. As the percentage of anxiety is the highest, the factors contributing to it will be analysed based on the collected data.

Table 2: Respondent’s states of mental health severity

Severity	Percentage		
	Depression	Anxiety	Stress
Normal	42.2	34.3	44.1
Mild	26.5	5.9	18.6
Moderate	21.6	18.6	23.5
Severe	6.9	25.5	12.7
Extremely Severe	2.9	15.7	1.0

A correlation analysis is performed involving the respondents' basic socio-demographic profile with depression, anxiety, and stress to find the relationship. The socio-demographic variables analysed were gender, age, employment status, household income, and dependents. The significant correlation of household income with anxiety is at the 0.01 level based on the analysis. The dependent's significance correlation with depression, anxiety, and stress is at the 0.01 level. The correlation analysis of the socio-demographic profile with the states of depression, anxiety, and stress is detailed in (Table 3).

Table 3: Socio-demographic and mental health relationship

Variables	Mental health states		
	Depression	Anxiety	Stress
Gender			
Coefficient (r)	-0.042	0.125	0.028
Significant p Value	0.676	0.212	0.784
Age			
Coefficient (r)	0.026	0.013	0.065
Significant p Value	0.794	0.896	0.515
Employment Status			
Coefficient (r)	-0.056	0.021	-0.014
Significant p-Value	0.578	0.834	0.886
Household Income			
Coefficient (r)	-0.090	-0.266**	-0.179
Significant p-Value	0.369	0.007	0.072
Number of Dependents			
Coefficient (r)	-0.314**	-0.294**	-0.324**
Significant p Value	0.001	0.003	0.001

However, based on the analysis, the relationship between gender, age, and employment status could not significantly correlate with depression, anxiety, and stress. The correlation between household income and anxiety might be due to most of the respondents' income of below MYR1,000. This income is considered a small income when living in an urban area. Most of them could not afford a better and comfortable living area. The number of dependents shows a significant correlation with depression, anxiety, and stress, which might be due to the

number of people living in one unit being overcrowded. Based on the collected data, 33.3 per cent of the respondents are residing alone or have two people in one housing unit. The remaining 66.7 per cent of respondents live together with three to ten people per housing unit. This housing scheme built up is only 650 square feet and one or two bedrooms. When the number of people living in one housing unit is more than three, this causes them to have limited space, less privacy, and inadequate spaces.

Low-cost housing living effect on mental health

Every living environment gives a different feeling to each person. The surrounding environment and in-house environment could provide a sense to the residents. A negative feeling will lead to a negative effect, especially in low-cost housing in the urban area. Most low-cost housing has smaller built-up spaces, inadequate facilities, and a noisy and deprived area. A total of ten questions were selected that consist of questions regarding the respondents’ feelings toward their home and neighbourhood. The correlation analysis performed for these questions with depression, anxiety, and stress shows that neighbourhood areas and own living spaces can also affect its residents without realising it. The details of the correlation analysis are shown in (Table 4).

Table 4: Correlation between respondents feeling and mental health

Variables	Mental health states		
	Depression	Anxiety	Stress
Negative feeling in the neighbourhood area			
Coefficient (r)	0.545**	0.343**	0.382**
Significant p Value	0.000	0.000	0.000
Sudden breathing difficulty in the neighbourhood area			
Coefficient (r)	0.287**	0.531**	0.457**
Significant p Value	0.003	0.000	0.000
Could not work up an initiative at home			
Coefficient (r)	0.606**	0.516**	0.629**
Significant p Value	0.000	0.000	0.000
Over-react to the situation at home			
Coefficient (r)	0.367**	0.460**	0.558**
Significant p Value	0.000	0.000	0.000
Agitated when at home			
Coefficient (r)	0.536**	0.381**	0.591**
Significant p Value	0.000	0.000	0.000
Difficulties to relax at home			
Coefficient (r)	0.601**	0.401**	0.617**

Variables	Mental health states		
	Depression	Anxiety	Stress
Significant p Value	0.000	0.000	0.000
Feeling downhearted and blue when at home			
Coefficient (r)	0.657**	0.333**	0.470**
Significant p Value	0.000	0.001	0.000
Close to panic when at home			
Coefficient (r)	0.466**	0.365**	0.382**
Significant p Value	0.000	0.000	0.000
Unable to become enthusiastic over anything when at home			
Coefficient (r)	0.718**	0.569**	0.578**
Significant p Value	0.000	0.000	0.000
Feeling scared without reason when at home			
Coefficient (r)	0.445**	0.504**	0.362**
Significant p Value	0.000	0.000	0.000

The analysis shows that the respondents' feelings when they are in their neighbourhood and home are perfectly correlated with depression, anxiety, and stress. The analysis shows that the respondents felt negative, insecure, and uneasy at home. A sense of a secure and safe neighbourhood area is vital for residents to live and perform their daily routines. However, when residents feel insecure, they will have difficulty performing their daily routine. Referring to (Table 4), the respondents' feelings are negative towards the neighbourhood and experience sudden breathing difficulties in the absence of physical exertion, which has a significant correlation at level 0.001.

A home is the most private space and place for relaxing and resting after working for all people. However, based on the analysis, it is found that the respondents were having difficulty relaxing, feeling insecure, and could not work up with initiatives or feel enthusiastic when they are at home. This feeling has a significant correlation at level 0.0001 with depression, anxiety, and stress. All these feelings are due to the respondents not having their own private spaces and an overcrowded home. Other than that, the feeling of insecurity is due to the gloomy and dark corridors, odour, suicide cases, and criminal cases. The neighbourhood's location is near a Light Rail Transit (LRT) station and near to a hectic traffic road with high-volume commercial centres creating excessive noise that can become a contributing factor to mental health problems in the long term. This is in line with Ma et al. (2018) and Pun et al. (2019) who found that a person living near the main road has a higher possibility of having anxiety, depression, fatigue, and sleep disturbances. The summary of (Table 4) shows that the residents are not happy in their own spaces, which can lead directly and indirectly, to depression, anxiety, and stress without realising it.

DISCUSSION

The analysis shows that residents' feelings when they are in their neighbourhood area and at home can increase depression, anxiety, and stress severity. There is a strong relationship between the respondents' feelings at home and depression, anxiety, and stress. The surrounding environment and in-house spaces contribute to the feeling. Smaller units, overcrowding, noise, dark and gloomy corridors, and insecurity give the residents a long-term effect on mental health.

Previous studies found that the built environment, such as housing spaces, surrounding, in-house overcrowding, and deprived areas can affect mental health directly and indirectly (Evans, 2003; Qiu et al., 2019; Singh et al., 2019; Suglia et al., 2011; Wang et al., 2018). In-house overcrowding causes the spaces in the house to be insufficient for the dwellers and having less privacy, which affects mental health (Cable & Sacker, 2019; Firdaus, 2017; Shultz et al., 2019; Marzukhi et al., 2020). It is in line with the significant correlation between the household number and depression, anxiety, and stress. The smaller size and limited housing units with a bigger number of households create distress for the household and are associated with mental health problems.

The location and surrounding environments, such as the surrounding land use, light, air, and provided facilities also have a relationship with mental health (Boadi et al., 2005; Kim & Yoo, 2019; James et al., 2017). The built environment, especially housing, is associated with mental health more than physical health (Barros et al., 2019; Tao et al., 2020). The low-cost housing location is usually in a lower estate value and generally in a deprived area. In this research, the residential area is located near the Kuala Lumpur City Centre. It is a bustling place and located near one of the LRT stations, where the surrounding roads are active most of the time with the vehicle sounds. The building has also been around for more than 50 years and has low maintenance and low-quality housing.

Built environment factors are supported by socioeconomic factors associated with mental health. The household income is significantly associated with mental health (An et al., 2020; Garrido-Cumbrera et al., 2018). A long-term impact on poverty, poor housing conditions, overcrowding and mental health is found (Ma et al., 2018; Pepin et al., 2018). Most likely, the residents have a lower income and higher dependents, causing them to be in lower-income groups. Most of the respondents could not afford to live in a better residential area due to the lack of resources. Apart from that, due to these areas being a walkable distance to a commercial and public transport station, it is more economical for them to travel to work using public transport instead of using personal vehicles, which cost higher.

A person's feelings towards their daily life, their surroundings, and working up to the daily routine are essential to determine the state of their mental health well-being. The feeling can be contributed to the surrounding environment, which either creates a negative or positive feeling depending on the stressor levels. Daily routines will expose a person to a different environment (Song et al., 2018).

Shobri et al (2021) and Firdaus (2017) found that the availability of basic facilities and green spaces could improve satisfaction levels towards life, making it easier for daily routines, and make people feel better and release stress. The environment could improve mental health through vibrancy, creativity, and excitement, especially in urban high-density residential areas (Boyko & Cooper, 2014). A negative perception or feeling threatened from the surrounding environment can contribute to poor mental health outcomes (Byers et al., 2019; Tao et al., 2020). Even though the feeling is a personal control, the surrounding environment can still affect and worsen the negative feeling if it is uncontrolled.

There were several strengths and limitations associated with low-cost living and mental health. A key strength of this study lies within the fact that the built environment, especially the housing environment, can give effect to mental health directly and indirectly, as the home is a place where people spend time the most. However, these findings are limited, as the study primarily focused on urban high-density residential and did not explore low-density residential.

CONCLUSIONS

The main conclusions of this study are drawn together and presented. These findings support the conclusion that the built environment, especially housing, is associated with mental health, whether directly or indirectly. A smaller space, an ageing building, insufficient spaces and facilities, and more environmental stressors can affect personal controls and lead to poor mental health. As the lower-income group could not afford to live in a better surrounding environment due to lack of resources, these groups often live in high-density, low-cost housing in most urban areas. As the number of dependents is increasing, and the spaces are limited, a home could not become a place where the dwellers could relax after working and the long-term effect of this has caused poor mental health that leads to mental health problems.

Housing is essential, and as a key determinant of health and happiness, the quality of life depends on the provision of housing and the facilities that come with it. Living spaces should be conducive and safe to secure people's daily life routine with minimal negativity and feeling threatened. People with mental health problems living in deprived, insecure, gloomy, dark, excessive noise, and crowded spaces will worsen their mental health problems. It will affect people with mental health problems and will gradually affect people without mental health problems in the long-term. The placement, design, facilities, and quality of low-cost housing need to be reconsidered. A low-cost housing with better lighting, ventilation, suitable location, and suitable design could improve residents' feelings about their housing quality. Thus, it affects mental health and promotes an improved quality of life.

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INVESTIGATING URBAN GROWTH BOUNDARY AS MECHANISM TO PLAN FOR SUSTAINABLE URBAN DEVELOPMENT

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Abstract

Urban encroachment into the peri-urban areas has blurred the borders between urban and rural areas. Thus, the urban growth boundary (UGB) has been used to encourage the sustainable development of cities and improve long-term planning efficiency. Studying the understanding of the UGB concept in ensuring sustainable development in Malaysia would be beneficial. This study aimed to investigate the perception and understanding of the UGB concept and function to achieve sustainable urban development. An online survey was conducted involving 82 experts, which comprised planners from PLANMalaysia and academicians in the field of urban planning. Results indicated that the perception of the UGB score was significantly greater by 1.16 than the normal score of 3, which indicated that the experts agreed that UGB could improve the urban development. The findings also indicated that the existing planning policy and inclusion of UGB had protected agricultural and natural land; however, stricter and tighter borderless development should be conducted.

Keywords: Urbanization, Sustainable Urban Development, Urban Growth Boundary, Urban Containment Boundary

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INTRODUCTION

Agenda 11 of the United Nations Sustainable Development Goals (SDGs) is the Sustainable Cities and Communities, which called for a better way to manage cities because cities are hubs for economic development and social well-being for most people on Earth (UN, 2016). It is projected that the population in cities will rise to 5 billion by 2030, with a higher rate in developing nations (Easton, 2012; UN-Habitat, 2016; Samat, 2019). Yet, in most countries, cities only occupied less than 10% of their total land area. Therefore, proper planning and management practices must be available to deal with urbanisation issues and related challenges (UN, 2016). Moreover, heavily populated cities can threaten the nation if they are not planned and managed properly (Samat, 2019). Planning should take the current situation into account and predict the future development for their sustainability (Othman et al., 2021). However, efforts to control urban development are often faced with challenges due to the lack of understanding and scientific tools or methods to maintain municipalities within controlled city boundaries (Cilliers, 2015; Fertner et al., 2016).

To use scarce land resources effectively in satisfying urban demand, the urban form has been utilised to manage growth (Sharma, 2014). The urban form has been claimed to shape the urban layout and promoting sustainable urban development (Zivkovic, 2019). The compact urban form with a high-density mixed-use and intensified urban form is more sustainable than the sprawl type of urban growth (IEREK, 2016). Furthermore, urban expansions with designated growth boundaries have also been popularly used to ensure land demand and supply will be allocated sustainably (Tayyebi et al., 2014). Although several developed countries have used this approach to plan and control urban expansion (Chen, 2020), not much effort has been exerted in developing nations. Thus, a proper understanding of this concept is needed to be effectively used as a planning tool. Thus, this study aims to investigate the understanding of the concept of urban growth boundary (UGB) and the perceptions of experts on urban growth in Malaysia.

RESEARCH BACKGROUND

UGB and the urban containment boundary (UCB) are defined as proactive growth management tools which sought to contain, control, direct or phase growth to promote a compact, contiguous urban development (Tayyebi et al., 2014). Moreover, Mathur (2014) and Chen (2020) also added that UGB could help preserve farmland or environmentally sensitive land (including hill slopes and forests), guide urban development towards the central, and encourage denser development. Historically, these two approaches have been used in urban growth limits since the end of the 19th century, where opposition started against the unregulated ribbon type of growth in England. In 1947, the Town and Country

Planning Act allowed the local authority to incorporate green belt proposals in their development plan in England. Subsequently, numerous countries such as Great Britain (Gunn, 2007), Australia (Eddo, 2007), Iran (Tayyebi et al., 2014), India (Venkataraman, 2014) and Saudi Arabia (Aldalbahi and Walker, 2015) have successfully adopted the UGB as a way to curb urban sprawl and overcome related problems.

In the United States, UGB was used to control urban sprawl. Portland, Oregon has used this concept as a planning mechanism to plan and project future sustainable urban expansion to accommodate a 20-year forecast of housing needs and employment growth (Oregon Metro, 2018). Similarly, Melbourne, Australia also used a similar approach to ensure sustainable land use to accommodate future urban expansion (Cilliers, 2015). In the United States, more than 100 cities have adopted this concept. Portland, Oregon has been one of the most published cities which used this approach to plan future expansion. Its suitability in Asian cities was assessed by Venkataraman (2014) in the city of Bengaluru, India, which aimed to limit urban sprawl within the city.

Furthermore, Aldalbahi and Walker (2015) also have emphasised that limiting urban growth within a specific boundary has allowed the transportation services to keep up on demand and commuting becomes much shorter in the city of Riyadh, Saudi Arabia. The People's Republic of China's Town and Country Planning Act required the establishment of urban construction boundaries in Chinese city master and detail plans in 2006 (Long et al., 2009) and has inspired the attention of the Chinese Government for restricting the irrational urban sprawl, protecting the green space and ecological space from being developed (Zheng et al., 2017; Ren et al., 2020). Furthermore, Zheng et al. (2017) also emphasised that UGB can be utilised to design and enforce extensive planning policies and decision-making mechanisms, such as land-use zoning systems, thus mitigating the adverse effects of blind urban growth and encouraging sustainable development.

Despite many positive views that UGB/UCB has been seen to achieve sustainable urban development, this concept has also been debated. In Melbourne, much concern was shown over unchecked development within existing UGB, which can result in unsustainable land use (Birrell, 2005). The investigation by Dierwechter and Carlson (2007) also highlighted that UGB could worsen traffic congestion and economic unsustainability for urban, suburban and local governments. Furthermore, other issues criticising UGB included escalating land prices, a distraction from creative planning and its lack of regional division. It was supported by Mathur (2014) that the UGB is most likely to increase land prices, depending on housing demand and supply elasticity for its effect on property prices.

Malaysia has started to adopt a sustainable development agenda back in 2001 when it became one of the national policy agendas within the Eight Malaysia Plan from 2001 to 2005 (Marzukhi et al., 2011; Adham et al., 2015). Furthermore, PLANMalaysia has developed a set of indicators which can be used to measure the development sustainability called the Malaysian Urban Indicators Network (MurniNet) system (Mun et al., 2019). This development was a national aspiration aimed at fulfilling the concept of sustainable development of the country (PLANMalaysia, n.d). Various initiatives have been conducted to achieve sustainable urban development where local municipal councils have played active roles in planning sustainable urban development. Among the initiatives are the Cleaner and Greener Penang initiatives by Pulau Pinang City Council, PJSmart City initiative by Petaling Jaya Municipal Council, Malaysia Smart City Programs by Ministry of Housing and Local Government and Green City Action Plan 2020 by Melaka State Government.

Cleaner and Greener Penang initiatives have proposed a way for Penang to restore the living environment in encouraging a cleaner and greener city (PPCC, 2017). It also improves the quality of life of Penangites by building a trilateral partnership with the state government, private sector company and community to empower the community to work closer towards a cleaner and greener Penang (PPCC, 2017). PJSmart City's initiative goals are to become a resilient and smart city by using technology to provide a cleaner, greener and more connected city (PJMC, 2017). Smart City programs have shown the government's effort to ensure which cities are smart and sustainable. This effort will leverage other national initiatives, such as the National Fiberization and Connectivity Plan (Ministry of Housing and Local Government of Malaysia, 2018).

Another initiative in Malaysia is the Green City Action Plan (GCAP), which seeks to transform into a low carbon city. Energy, transport and waste are important in the GCAP, among other projects, such as tourism and water management (Jamaludin and Sulaiman, 2018). GCAP prioritises the reduction of GHG emissions in the energy sector by preparing a comprehensive energy plan and implementing demonstration projects to reduce energy consumption (Melaka State Government, 2020). Although various initiatives have been conducted in planning for sustainable urban development, UGB/UCB can function as a mechanism in achieving sustainable urban development. This initiative was already outlined in the 2nd National Urbanization Policy. Thus, this study aimed to investigate the understanding of the UGB and USG concepts in the context of Malaysia.

MATERIALS AND METHODS

This study explores the usage of UGB/UCB as mechanism for promoting sustainable urban development. The study used a quantitative survey, which involved asking the experts to answer a self-administered online questionnaire. The survey was conducted in English and Malay based on the respondents' preference, and the questionnaire required approximately 10 minutes to complete. Apart from providing their demographic information, participants responded to 12 statements which potentially reflected the perception of experts in urban planning in Malaysia on the suitability of UGB as a planning growth policy. Therefore, the online survey was conducted to measure the respondents' perception of urban growth in Malaysia and their understanding of the concept of UGB and how it can be used to plan and manage USG. Therefore, in the last section, the perception of those who understood the meaning of the UGB concept was considered. The scores were based on a five-point Likert scale (from 1=*strongly disagree* to 5=*strongly agree*).

The survey was conducted from 15 to 30 March 2020 using purposive sampling. The selected respondents were those who had worked or conducted research and teaching on planning-related sectors, such as PLANMalaysia and academicians in the field of urban planning. Those respondents are knowledgeable, experienced and are experts in urban planning, thus making the findings suitable in the context of planning in Malaysia (Utomo et al., 2018). Therefore, the 82 respondents participated in the survey is sufficient to provide an input for this study (Thordal-le Qument, 2016). Six statements were used to investigate the respondents' perceptions on urban expansion and planning policy in Malaysia. Moreover, six statements were used to measure the respondents' perception of urban growth boundary as a mechanism to achieve sustainable urban development.

Reliability tests were conducted to ensure the validity of the study. Results indicated that the Cronbach's alpha for UGB is $\alpha = 0.719$ and USG is $\alpha = 0.706$. This indicated that the survey instrument was valid and reliable.

FINDINGS AND DISCUSSIONS

Profile of the Respondents

This study aimed to understand the perception of local experts on the UGB concept and the suitability of this concept in planning for sustainable urban development in the context of Malaysia. In total, 82 respondents aged 18 years and older answered the survey. Thus, all respondents have work experience in urban planning and development in Malaysia. Table 1 depicted the demographic characteristics of the respondents. Out of 82 respondents, slightly over 64% of the respondents were male. The majority of respondents were from 18 to 27 years old.

This study aimed to identify perceptions on the suitability of UGB as a planning mechanism to achieve sustainable urban development in Malaysia. Table 1 shows that most respondents have had experience in the planning sector in Malaysia for more than five years (57.3%). Only 25 respondents (30.5%) had less than five years of experience in Malaysia's planning sectors.

Table 1: Respondents' Demographic Characteristics

Demographic variables	Categories	Frequency (%) (Percentage) (n=82)
Gender	Male	53 (64.6%)
	Female	29 (35.4%)
Age	18 - 27 years old	33 (40.2%)
	28 - 37 years old	16 (19.5%)
	38 - 47 years old	16 (19.5%)
	48 - 60 years old	16 (19.5%)
	More than 60 years old	1 (1.2%)
Education	Certificate or below	1 (1.2%)
	Diploma or Bachelor's Degree	59 (72.0%)
	Master or PhD Degree	22 (26.8%)
Experience in planning sector	Less than 5 years	25 (30.5%)
	Between 5 and 10 years	9 (11.0%)
	Between 10 and 15 years	12 (14.6%)
	Between 15 and 20 years	11 (13.4%)
	More than 20 years	15 (18.3%)
	Not applicable	10 (12.2%)

Perception of UGB in Malaysia

Based on the previous analysis on reliability, five statements were used to investigate the respondents' perception of Malaysia's urban expansion and planning policy. Table 2 shows the descriptive statistics of the respondents' perceptions on UGB in Malaysia. The perceptions asked in the questions involved urban growth and existing policy, which guided urban planning and development in Malaysia. The mean values for all items were above 3, indicating that the respondents tend to agree with the statements and perceived that UGB is a useful concept to control USG in Malaysia.

As indicated in Table 2, planners agreed that UGB could manage urban spatial growth with a mean value of 3.91 ($SD = 0.789$). As to the second question on the ability of UGB to protect agricultural and natural land, the value of 4.16 indicated that the respondents had an overly strong tendency within their answer.

Respondents also strongly agreed that UGB could be used to plan future urban expansion. The findings from the analysis further indicated that respondents strongly agreed on the role of UGB in planning future urban expansion. As stated in DPN2, UCB and UGB have become policy approaches at the national level to manage urban spatial growth in Malaysia (PLANMalaysia, 2016). Although this concept was yet to be implemented in Malaysia, it was piloted for the city of Kuantan, Pahang. Finally, respondents strongly agreed that UGB could be used to handle crisis situations such as virus outbreaks. For example, in handling diseases or viruses such as COVID-19, spatial connectivity through transportation hubs can easily be controlled if a boundary exists between urban and non-urban areas. Thus, the spatial diffusion of COVID-19 can easily be broken at the edge of the city (Neiderud, 2015, Samat, 2020).

In addition to descriptive statistics, the one-sample t-test was used to determine whether the sample mean comes from a distribution with a given mean and construct confidence intervals for the mean. Based on the summative score of perception of UGB, the result indicated that the perception on UGB score was statistically and significantly greater by 1.16 (95% CI, 1.06 to 1.26) than the normal score of 3, $t(81) = 22.996, p < 0.01$.

Table 2: Descriptive Statistics of Perceptions of Respondents on UGB in Malaysia

Item	Perception on UGB	Mean	SD
UGB1	UGB has successfully been used to control urban spatial growth.	3.91	0.789
UGB2	UGB can preserve natural and agricultural areas	4.16	0.711
UGB3	UGB can assist planners in directing urban future.	4.32	0.564
UGB4	UGB can be used to ensure sustainable cities and communities.	4.26	0.562
UGB6	In crisis such as disease outbreak, UGB can also be used to control spread of disease.	4.15	0.669

Perception on Controlling USG

The survey asked the respondents to rate their perceptions on controlling USG in Malaysia. As shown in Table 2, respondents agreed that urban growth in Malaysia cannot be controlled. The mean value of 2.82 ($SD=1.135$) indicated that most respondents tends to disagree with that statement. Urban expansion has not encroached into agricultural land, which also has a low mean score of 2.06. It shows that most respondents disagreed with the statement. The findings has shown that proper planning and monitoring need to be conducted since Malaysia is experiencing rapid urbanisation. For example, In 2015, Malaysia's population was 31.4 million, with 74% of them residing in urban areas. However, in 2020, the population increased to 33.8 million, and 77% lived in urban areas. It was projected to reach 41.5 million in 2040, with 85% living in urban areas (Samat,

2019). In Peninsular Malaysia, the size of the build-up area has increased from only 435,090 ha to 759,900 ha from 2001 to 2008. In 2015, it increased further to 1,160,553 ha (NPP, 2001; 2008; 2015; Samat, 2019). Although the built-up area only covered 8.8% of the total land area of Peninsular Malaysia, more than 74% of the population lived within this area. Thus, a systematic planning approach needs to be implemented to ensure that rapid expansion of urban areas does not have negative effects.

Table 3: Descriptive Statistics of perceptions of Controlling USG in Malaysia

Item	Perception on controlling USG	Mean	SD
USG1	Urban growth in Malaysia can be controlled.	2.82	1.135
USG2	Urban expansion in Malaysia has not encroached into agricultural land.	2.06	.880
USG4	Urban expansion in Malaysia is sustainable.	3.21	.782
USG5	Available policies and plans have managed to ensure sustainable urban development.	3.41	.916
USG6	Malaysia has enough resources and policies to handle the crisis in an urban area.	3.28	.959

The findings also indicated that respondents tend to agree that existing urban planning policy and strategy have managed to ensure sustainable urban development with a mean score of 3.21. Furthermore, respondents also agreed that Malaysia has enough resources and policies to handle the crisis in an urban area, with a mean score of 3.28. Malaysia has been tested with the recent outbreak of COVID-19, which became a pandemic as announced by the World Health Organization on 11 March 2020. Thus, it is timely to reexamine the existing planning policy to ensure tighter control which has been placed on borderless development (Samat, 2020), such that UGB/UCB should be implemented (PlanMalaysia, 2016). The result of the one-sample t-test has shown that the perception on controlling USG score (Mean = 2.96, SD = 0.638) was not different from (95% CI, -0.18 to 0.09) the normal score of 3, $t(81) = -0.623$, $p > 0.05$. Based on the study, experts agreed that UGB could be used towards achieving sustainable urban development. Thus, this concept should be put into practice where dynamic urban models such as the cellular automata model can be used to predict future need and location of land for development. Thus, UGB can be determined and monitor such development by taking the need of future generations into account.

CONCLUSION

Urban expansion and industrialisation in Malaysia have caused various socio-economic and environmental issues in urban and rural areas (Utomo et al., 2018). Therefore, the spread of cities beyond their boundaries has caused a new realm

of challenges for urban management about poverty, urban sprawl and social disorder. While a few studies emerged to understand the UGB concept and reveal the effect of UGBs on sustainable urban development in Malaysia, this study featured the contribution of UGB to evaluate the experts' perception about UGB to control USG for the protection of agricultural and natural land into the future of Malaysia. UGB and other urban land policies have contributed to Malaysia's USG. Still, the separation of their percentages in the direction of USG is a considerable issue that cannot be revealed through technical approaches. Thus, the study was conducted by looking at the experts' opinions quantitatively as researchers are advised to use judgmental data quantification to reduce bias and enhance the reliability of research findings (Bruce et al., 2008; Thordal-le Quement, 2016). However, findings from this study indicated that experts are aware that urban spatial growth has encroached on the urban fringe. Although they strongly believed that the existing policy and plans managed to ensure that sustainable urban development is achieved, previous studies indicated that the agricultural and natural land had been overtaken by the manufacturing and services sector (Utomo et al. 2018). Consistent with Long et al. (2015) and Zheng et al. (2017), experts believed that UGB could be used to manage USG in Malaysia. Although respondents demonstrated that Malaysia has adequate resources and policies to tackle challenges in urban and peri-urban areas, this study is in agreement with Samat (2020) which showed that the existing planning policy could be reevaluated to establish an accurate investigation for developing land beyond UCB. Nevertheless, this study was conducted without an in-depth analysis on sustainability, including development, considering the physical, social and environmental elements. A further study with an in-depth survey would probably reveal more concrete results.

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TRAVEL MODE CHOICE INTENTION IN REDUCING TRAFFIC CONGESTION IN KAJANG, SELANGOR

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Abstract

The intentions behind a person's choice of transportation mode is vital information to have in strategic planning for a sustainable transportation system, and is very useful in predicting the behaviours of people. This paper was conducted to identify people's preferences of public transport. Using the Theory of Planned Behaviour (TPB) as the psychological determinant, three main indicators, attitude, subjective norm and perceived behavioural control (PBC), were explored to identify the mode choice of public transportation among the residents of Kajang. The data was obtained through questionnaires by employing a multistage sampling technique, where 348 respondents were approached. Partial Least Square (PLS) analysis showed that attitude was the dominant indicator among residents of Kajang for modes of public transport. This paper will contribute to the advancement of knowledge in the theory of mobility and travel behaviour, as well as act as baseline data for predicting people's travel behaviour in future mode shift strategies dealing with everyday issues of traffic, such as congestion.

Keywords: Travel intention, psychological mechanism, Theory of Planned Behaviour, public transport

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INTRODUCTION

The current developments in the transportation sector have proven to be unsustainable, and require a change in people's travel behaviour to reduce traffic congestion. This is owing to the fact that road traffic has risen substantially over time as a result of most homes now owning two or more vehicles (Nasrudin, Abdullah & Hoon Leh, 2017). Using public transport is a viable solution to the alarming trend of motorization (Suwardo et al., 2015). Focusing on mode choice behaviour for public transport is an important aspect of public transport planning, as it has a direct impact on shaping the structure of the urban transport system and forms the basis of urban public transport planning and management (Chen & Li, 2017). However, a low percentage of public transport ridership impedes the achievement of objectives to reduce traffic congestion and air pollution (Nghah et al., 2020).

Due to the inefficiency of public transport, many people are forced to travel by car, which exacerbates traffic congestion. The modal share of public transport in Malaysia is currently over 20%, which is a worrying indicator of the future of the country's urban transport system that needs to be reconsidered (Abdelfatah et al., 2015). According to previous research, the decision to use public transport is a difficult one that is influenced by a variety of circumstances. First, research by Kamaruddin, Osman, and Che Pei (2012), showed that 32.3% of their sample size considered safety to be the most important factor affecting customer satisfaction in terms of public transportation. Furthermore, according to Eriksson and Forward (2011), buses are associated with delays and may not be available when you need them apart from not being able to cater for certain locations. Finally, Shaaban and Maher (2019) found that commuters who have to wait longer for public transportation are prone to higher levels of stress. It can be concluded that more congestion, a higher loss of productivity, poorer quality of life and lower levels of liveability and competitiveness may result from the lack of an effective public transport system (Abdelfatah et al., 2015). Hence, for well-functioning and sustainable cities, an effective public transportation network is required.

This paper focusses on the travel intentions behind public transportation usage among people living in Kajang, Selangor, with a particular emphasis on the relationship between psychological determinants and the final travel behaviour of the riders. Intention refers to what people intend their behaviour to be. The stronger the intent to perform the behaviour, the more likely it is the behaviour will be performed. It is important to recognise the intentions of people using public transport, as well as to meet the expectations of the public, because, in general, user satisfaction is the most important consideration of any service provider (Hamzah, Ayub & Hilmi, 2015).

THEORITICAL FRAMEWORK

Psychological predictors are critical for comprehending travel-related decisions, especially in the design and implementation of successful transportation policies aimed at reducing vehicle usage in cities (Garcia et al, 2019). Such predictors are defined through the Theory of Planned Behaviour (TPB), and often apply to travel research. This theory is a helpful conceptual framework for better understanding the complexities of human social behaviour (Ajzen, 1991). According to the TPB model, individuals' behavioural intentions are shaped by attitudes, subjective norms and perceived behavioural control (PBC) (Ambak et al., 2016). Behavioural intention, according to Ajzen (1991), is a cognitive representation of a person's willingness to perform a specific activity, and is seen as an immediate antecedent of actual behaviour. The intentions are the precursors to behaviour (Ambak et al., 2016). Attitude is the first predictor. Achaempong (2017) claims that attitude is the anticipation of all consequences an action or behaviour may result in, as well as a reflection of the personal values associated with these outcomes. Subjective norm, on the other hand, is described in Dill et al. (2014) as a person's view of whether or not those significant to them believe they should execute a behaviour. Last but not least, the third predictor, PBC, reflects a person's opinion of how easy or difficult it will be to accomplish a specific behaviour (Zailani et al., 2016). Overall, behavioural intention' will henceforth be referred to as 'travel intention' within this paper, as it is its appropriate name in the field of transportation.

RESEARCH MODEL AND HYPOTHESES

The TPB model was used to investigate the extent to which attitude, subjective norms and PBC directly impacted Kajang's residents' intentions to take public transport. Figure 1 illustrates the conceptual model:

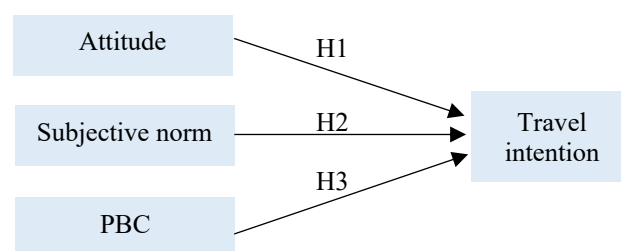


Figure 1: Travel Intention Conceptual Framework

To begin, a hypothesis for attitudes regarding travel intentions was created. According to Li et al. (2015), compared to subjective norms and PBC, attitude plays a much larger role in affecting the choice to take public transport, indicating

that improving travellers' attitudes can considerably boost their intentions to utilise public transportation. Zailani et al. (2016) discovered that attitude is a significant predictor of the intention to utilise public transport for a diverse range of objectives, explaining the 34.6% variation in intention found in their results.

Next, in terms of subjective norm, the majority of prior research has found a link between subjective norm and travel intention. The findings of Fu and Juan (2017), which studied travel intention alongside Customer Satisfaction Theory (CST), demonstrate that subjective norm is the most significant predictor of behavioural intention in regards to public transport usage. The study also claims that, while subjective norm does not influence target behaviour directly, it does have a beneficial impact on behavioural intention indirectly.

Last but not least, prior studies have revealed a link between PBC and intention as a third predictor in TPB. A study that predicted PBC as being mediated by travel intention in predicting travel behaviour is Zailani et al. (2016). PBC was shown to be a significant predictor of the intention to utilise public transportation for a variety of reasons, accounting for 49.8% of the variation in the study's results. Using an online and paper-based survey, Li et al. (2015) found that PBC partially explained the variance in intention discovered by the researcher. In addition to this, their quantitative survey analysis revealed that PBC has a greater impact on intention than on behaviour.

In conclusion, based on the discussions above, the hypotheses derived for this paper were:

H1: Attitudes have an effect on travel intentions for public transport.

H2: Subjective norms have an effect on travel intentions for public transport.

H3: PBC has an effect on travel intentions for public transport.

RESEARCH METHODOLOGY

Research Area

Kajang, Selangor was selected as the research area to study the growing problem of traffic congestion. Salem et al. (2011) highlighted that Kajang has a high rate of car ownership and use, making it the ideal place to look into the impact of parking policies for lowering car usage. Moreover, in terms of public transport usage, research by Norhisham et al. (2018), using the Quality of Service (QOS) system, found that Kajang was in dire need of improvement.

Household Survey

Kajang is divided into sixteen sections. Two sections, Section 4 and 7, were selected through the multistage sampling technique demonstrated in Fadzil & Rashid (2012). Household surveys, utilising self-administered questionnaires, were collected from 360 respondents to gain a thorough understanding of the

situation, however only 348 were deemed usable. The Partial Least Squares Structural Equation Modelling (PLS-SEM) method was used with the SmartPLS 3.0 software to assess the determinants influencing travel intention. In most cases, a PLS-SEM result is analysed and evaluated in two models: a measurement model (reliability and validity of the measure generated) and a structural model (hypothesis testing).

THE RESULTS AND DISCUSSION

Measurement Model

Figure 1, Figure 2 and Table 1 summarise the results of the measurement model. Recommended by Ramayah et al. (2018), the analytical measurement model included four assessments: examining indicator loadings; testing the reliability of internal consistency; evaluating convergent validity; and evaluating discriminant validity. According to Hussain et al. (2018), the appropriate cut off value for indicator loading is 0.7. Owing to an indicator loading of less than 0.7 (Figure 1), one item from PBC (pbc-3) was removed from the model.

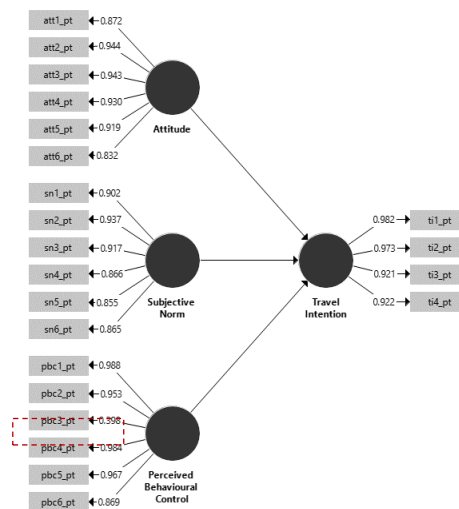


Figure 1: Initial Indicator Loading

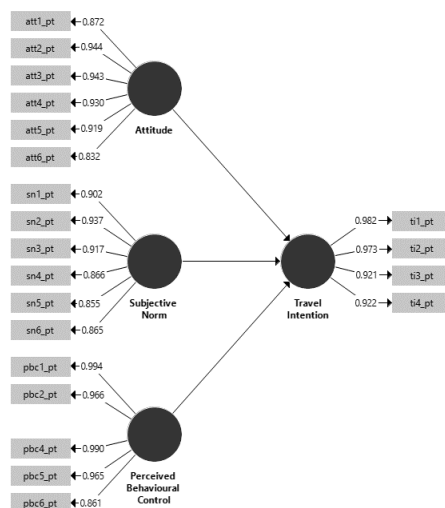


Figure 2: Final Indicator Loading

For the remaining items (Figure 2), Cronbach's alpha and composite reliability (CR) were used to measure their internal consistency reliabilities. This paper relied on Chen and Yan's (2019) accepted value of > 0.7 for both Cronbach's alpha and CR. Convergent validity is the initial stage in determining validity. It was determined by computing the AVE value for the psychological construct for public transportation. An acceptable AVE score is 0.50 or above, which indicates that the construct explains over 50% of the variation found in its components on average (Sarstedt et al., 2014). Cronbach's alpha, CR and AVE values for this study's construct are listed in Table 1.

Table 1: Cronbach's alpha, CR, and AVE

Variable	Cronbach's Alpha	CR	AVE
Attitude	0.957	0.966	0.824
PBC	0.977	0.982	0.915
Subjective norm	0.948	0.958	0.794
Travel intention	0.964	0.974	0.903

After construct reliability and convergent validity have been proven, the discriminant validity of the construct must be evaluated. The discriminant validity was assessed using the Fornell and Larcker criteria, as well as through cross-loadings (Hussain et al., 2018; Hair et al., 2011). According to Xin et al. (2019), the square root of the AVE for the measured variables should be larger than their correlation coefficients, suggesting a strong discriminant validity for

the Fornell and Larcker criteria. To calculate cross-loadings, however, each indicator loading must be at their highest for their assigned sub-construct on the same row (Hair et al., 2011). Table 2 and Table 3 showcase this study's discriminant validity results. The psychological construct of this study successfully attained acceptable discriminant validity, as seen in the two tables.

Table 2: Fornell and Lacker Criterion

Variable	Attitude	PBC	Subjective Norm	Travel behaviour
Attitude	0.908			
PBC	0.360	0.957		
Subjective Norm	0.425	0.246	0.891	
Travel intention	0.719	0.464	0.561	0.950

Table 3: Cross Loading

	Attitude	PBC	Subjective Norm	Travel intention
att1_pt	0.872	0.257	0.336	0.545
att2_pt	0.944	0.393	0.398	0.672
att3_pt	0.943	0.380	0.400	0.722
att4_pt	0.930	0.325	0.365	0.671
att5_pt	0.919	0.272	0.399	0.663
att6_pt	0.832	0.321	0.413	0.619
pbc1_pt	0.352	0.994	0.241	0.453
pbc2_pt	0.405	0.966	0.251	0.483
pbc4_pt	0.398	0.990	0.270	0.499
pbc5_pt	0.351	0.965	0.257	0.455
pbc6_pt	0.134	0.861	0.115	0.267
sn1_pt	0.357	0.123	0.902	0.481
sn2_pt	0.383	0.158	0.937	0.522
sn3_pt	0.375	0.172	0.917	0.508
sn4_pt	0.328	0.226	0.866	0.403
sn5_pt	0.300	0.221	0.855	0.402
sn6_pt	0.482	0.382	0.865	0.616
ti1_pt	0.675	0.461	0.560	0.982
ti2_pt	0.648	0.466	0.546	0.973
ti3_pt	0.746	0.412	0.585	0.921
ti4_pt	0.654	0.424	0.425	0.922

Structural Model/ Testing the Hypotheses of Travel Intentions regarding Public Transport

Once all the constructs of measurement were proven to be reliable and valid, the structural model was evaluated. The significance of the results was determined using 500 samples bootstrapped from the initial 348 cases. The testing hypothesis for each path analysis suggested in the research hypotheses is shown in Figure 1. With 0.05 and >1.96, the P-values and T-values were both significant (Hair et al., 2011). Surprisingly, all constructs of the study contributed significantly to the dependent variable. It was confirmed, by looking at the results in Table 4 and Figure 1, that attitude ($\beta = 0.522$; $T = 15.266$; $P = 0.000$) had a substantial impact on travel intention. As a result, H1 received a lot of support. Furthermore, when looking at the positive effects of subjective norm on travel intention (H2), the data showed that subjective norms influenced travel intention favourably ($\beta = 0.205$; $T = 4.507$; $P = 0.000$), and confirmed H2. PBC had a favourable and substantial impact on travel intention ($\beta = 0.288$; $T = 6.437$; $P = 0.000$), indicating that H3 was supported.

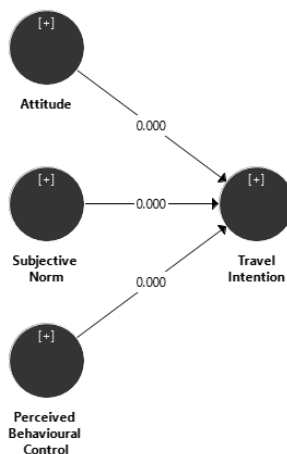


Figure 3: Path Analysis Assessment

Table 4: Testing Hypotheses

	Hypothesized Path	Path-Coefficient (β)	T-Statistic	Result
H1	Attitude > Travel Intention	0.522	15.266	Significance
H2	Subjective Norm > Travel Intention	0.205	4.507	Significance
H3	PBC > Travel Intention	0.288	6.437	Significance

Notes: Significance at P-values < 0.05 and T-values > 1.96

According to Hussain et al. (2018), the value of beta (β), or the path coefficient, denotes the expected variation that will be found in the dependent construct for every unit of variation in the independent construct; or, the greater the value of β , the stronger the effects of an independent construct on the dependent construct. In this paper, the results of β (Table 4) show that, for every one unit rise in attitude, subjective norm and PBC, the predictors contributed 0.522, 0.205 and 0.288 increases in travel intention, respectively. Attitude was the strongest predictor of travel intention in this study. This is consistent with most previous research (Li et al., 2015; Zailani et al., 2016), which proves that improvements in travelling attitudes can significantly increase a person's intention to use public transportation. Overall, the goal of this paper was to determine the intentions behind using public transport in order to encourage more travellers to switch from private vehicles to public transport. Due to the importance of attitudes in social psychology, theories from that field may be beneficial to better understanding travel behaviour, and, as a result, developing more successful ways of modifying planning practices (Dill et al., 2014).

CONCLUSION AND RECOMMENDATION

This paper has highlighted the determinants affecting the intention behind travel mode choices by adopting psychological variables into the study's conceptual model. These determinants have been analysed using the Partial Least Squares Structural Equation Modelling (PLS-SEM) via the SmartPLS 3.0 software. Hence, the conclusions drawn from this paper are as follows:

1. The 348 participants of this study made for a sufficiently large sample size, as confirmed by the overall acceptable value for measurement and structural model.
2. All the variables had substantial impacts on public transportation users' travel intentions, with attitude being the most important predictor, followed by PBC and subjective norm.

More research should be conducted in the future to determine the impact of attributes related to people's decisions for using public transportation, such as travel characteristics or socio-demographic factors, in order to encourage people to use public transportation in Kajang, Selangor and other cities. Aside from that, this approach should be used in other cities and countries to analyse people's choices of transportation modes.

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THE INFLUENCE OF LAND USE ACTIVITIES TOWARDS MASS RAPID TRANSIT (MRT) FEEDER BUS SERVICE RIDERSHIP

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Abstract

The Mass Rapid Transit (MRT) feeder bus service is a complementary public transport service provided to encourage ridership of MRT rail services in Malaysia. In brief, this feeder bus service plays a role in connecting people to and from MRT stations. The objective of this study is to determine the passenger volume generated at each MRT feeder bus stop location in the study area, and relate it to surrounding land use activities. Using the rule of thumb in public transportation systems, 200 m and 400 m radial buffers were identified as catchment areas of the bus stops. The key finding from this study is the relationship between volume of passenger and land use activities. This study concludes that land use activities influence MRT ridership, and that the presence of shelters or waiting poles is important to encourage ingress or egress.

Keywords: feeder bus, catchment area, land use activities, ridership

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INTRODUCTION

Over the years, land use has significantly impacted traffic mobility (Zuo, Wei, & Rohne, 2018), therefore, land use and transit planning must be coordinated simultaneously (Litman, 2008) because it can influence on people's habits, behaviour, culture, identity (Colonna, Berloco, & Circella, 2012) and eventually mode choice (Vos, 2015). Normative practice of self-oriented transportation development has resulted in the lack of mutual, shared and interoperable transportation principles, leading to transfer difficulties and deficiency between various mode of transports (Chen, Shan, Ye, Yi, & Wang, 2017). Thus, integration between bus and rail modes is important to ease the interchange between modes of transportation (Clifton & Mulley, 2018) as some passengers use both services in one trip to their final destination (Ciaffi, Cipriani, & Petrelli, 2012).

Despite the development and improvements of new and existing rail transits, however, huge challenges and limitations are still present as the ridership captured is not optimum (Hu, Zhang, & Wang, 2012). Hence, the accessibility of an existing feeder network is an important determinant in yielding ridership (Tabassum, Tanaka, Nakamura, & Ryo, 2017) as it eases access to the transport services. Globally, feeder shuttle service is the most common method used to encourage rail ridership (Anspacher, Khattak, & Yim, 2005) as it connects different modes of transportation (Bachok & Zin, 2017) and considered the supplementary role required for sustainable development of urban transit system (Hu et al., 2012), while feeder routes serve as linkage between local areas (demand) with main transit networks (Ciaffi, Cipriani, & Petrelli, 2012). In brief, integrating bus service facilities and features with urban rail transit services could bring significant benefits to the development of urban public transportation systems.

PAST STUDIES OF CATCHMENT AREA CONCEPT

In past studies, catchment areas had been defined in several ways. The most common definition is the distance that a pedestrian is willing to walk to access the transit (Flamm & Rivasplata, 2014; Jiang, Zegras, & Mehndiratta, 2012). The fundamental distance thresholds of 400 m (1/4 mile) and 800 m (1/2 mile) of pedestrian catchment areas were used as these are the acceptable walking distance (El-geneidy, Grimsrud, & Rania, 2014; Guerra, Cervero, & Tischler, 2012). A radial-based catchment area was widely used (Guerra et al., 2012) in transportation planning practices, for example, a service area analysis of stop's coverage was conducted by Tabassum et al. (2017) to estimate the number of people that were able to use the service within walking distance.

In Malaysian context, the Green Neighbourhood Guidelines developed by the Federal Department of Town and Country Planning (FDTCP) states that for human mobility within a neighbourhood, common facilities such as bus stops are

to be situated in walkable locations that are within 400 m or a five-minute walk, and transit stations are to be situated within 800 m or a ten-minute walk. Thus, in this study, the catchment area is measured at 200 m and 400 m radial distance from each bus stop. This scale is chosen based on previous research by Azmi and Karim (2012) and Sukor and Fisal (2018) on public transport users' willingness to walk in Malaysian cities. However, willingness to walk is also associated with land use activities and the environment.

A more clustered land use has higher possibility to attract public transportation users with lesser widespread public transportation networks, thus curbing the urban sprawl (Vos, 2015). According to Gu, Hickman, and Tong (2013) different land uses have different effects on the demand of public transportation and Stojanovski (2018) found land use diversity positively results in more passengers boarding the buses. Nevertheless, transit ridership is limited by the number of people working or living within the catchment area (Flamm & Rivasplata, 2014), for example, only 30% from the number of residents and jobs contribute to bus patronage (Stojanovski, 2018). Hu, Fille, Khoon, Guang, and Monterola (2016) investigated the relationship between land use and public transportation ridership. By identifying the boarding and alighting rate for each locality and the land use data parcel around each transportation point, the transportation demand at a certain point provide information on its role in the entire system (Hu, Fille, Khoon, Guang, & Monterola, 2016). Therefore, in this study, the number of passenger ingress at each bus stop were identified and related to existing land use activities.

METHODS

Site selection

Kajang was selected due to its highest population and density within the whole district. Kajang MRT Station serves as the first or last station for the MRT Sungai Buloh–Kajang line and acts as an interchange station with another rail line service which is KTM commuter (Kajang Station). Four feeder buses served the Kajang MRT Station: i) T461 Taman Kajang Utama; ii) T462 Seksyen 4 Bandar Baru Bangi; iii) T463 Seksyen 8 Bandar Baru Bangi; and iv) T464 Teras Jernang.

Bus stops marking and route tracking

The existing bus stop signages or shelters for each bus stop in all routes were identified on site and their locations were marked into a GPS device. Locations of passenger waiting areas without signages were marked based on information given by bus drivers. The collected bus stop coordinates were used as reference points when recreating bus stop points for the actual data analysis process.

Land use analysis

Land use data around 200 m and 400 m radius from bus stops were used for the catchment area analysis in this study. Land use activities were recategorized to simplify the interpretation of land use composition around bus stops, while ensuring the significance of each land use throughout the data analysis process without excluding any land use activities. The listed 36 land use activities identified by local authority were regroup into 11 main land use categories for the purpose of bus stops catchment analysis (refer legend in **Figure 2**). Land use around a bus stop was identified through GIS spatial analysis by generating bus stop buffers. Figure 1 shows the flow of technique used to demarcate the buffer zone from bus stops and to obtain land use composition by using query expressions in ArcGIS 10.7.

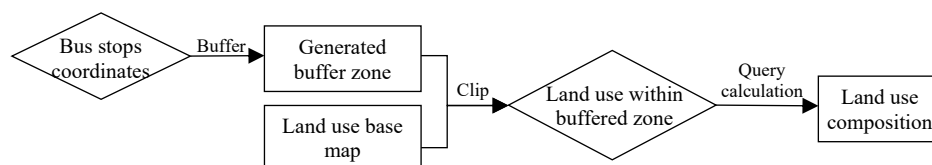


Figure 1: Flow of techniques used in demarcating buffer zone and calculating land use composition.

On-board survey

On-board observation was conducted to collect the data of passenger ingress at each bus stop during the whole journey for each trip selected. The data was collected on three weekdays and two weekends. For each day, at least 15 trips were selected and observed at each route including peak and off-peak hours. The data presented in this paper was collected in early 2020.

FINDINGS AND DISCUSSION

Land use activities and composition

Catchment along the full route was not conducted in this study because it might not fully reflect the whole catchment area as the distance between one bus stop to another varies and might be longer than the acceptable walking distance. This could introduce gaps in the route's catchment area and reduce the willingness to walk to access feeder bus services (bus stops). Therefore, the overlapping buffer of 200 m and 400 m from each bus stop within all routes were merged into one continuous buffer representing the catchment area as a whole. **Figure 2** shows the catchment area for all four feeder bus routes served by Kajang MRT Station which approximately covers an area of 1775 ha. The catchment areas served by these routes mostly travel southward from Kajang MRT Station with T464 route serving the farthest route. This route also covers the Kajang Town located at the north side of Kajang MRT Station.

Figure 3 shows the total land use covered by activities within the 200 m and 400 m service catchment areas. In both buffer zones, the highest land use covered is transportation namely road and railway which is excluded from this discussion. While road and railway are important for connectivity and accessibility in transportation network study, this study focuses on land uses that can potentially generate passengers. Therefore, within 200 m buffer, the highest land use activities covered is residential (24.11%), followed by institution and public facilities (12.26%), and open spaces and recreational (10.14%).

Similar proportion of land use activities covered is shown in **Figure 3** within buffer of 400 m with the highest being residential (24.21%), followed by institution and public facilities (12.99%), and open spaces and recreational (13.97%). In overall, almost three quarter of land use covered by all routes are trip generation and attraction areas that are capable of inducing higher number of feeder bus users.

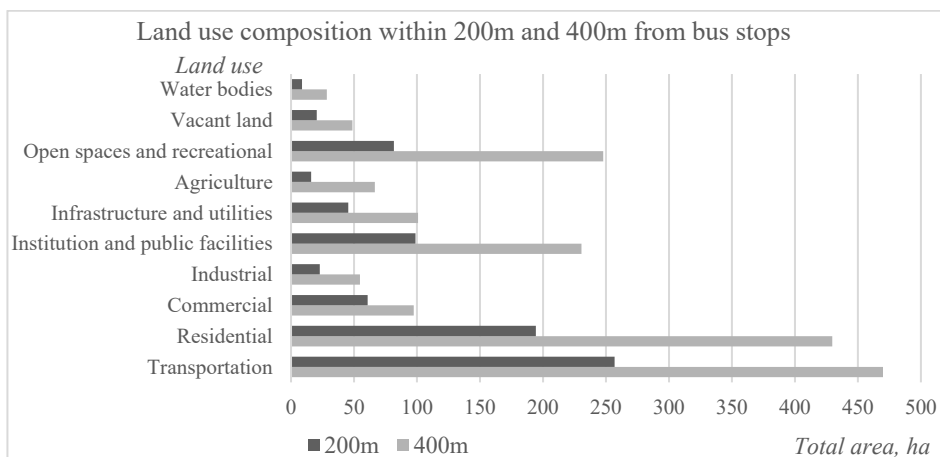


Figure 3: Total area of each land use activities within 200 m and 400 m of service catchment area

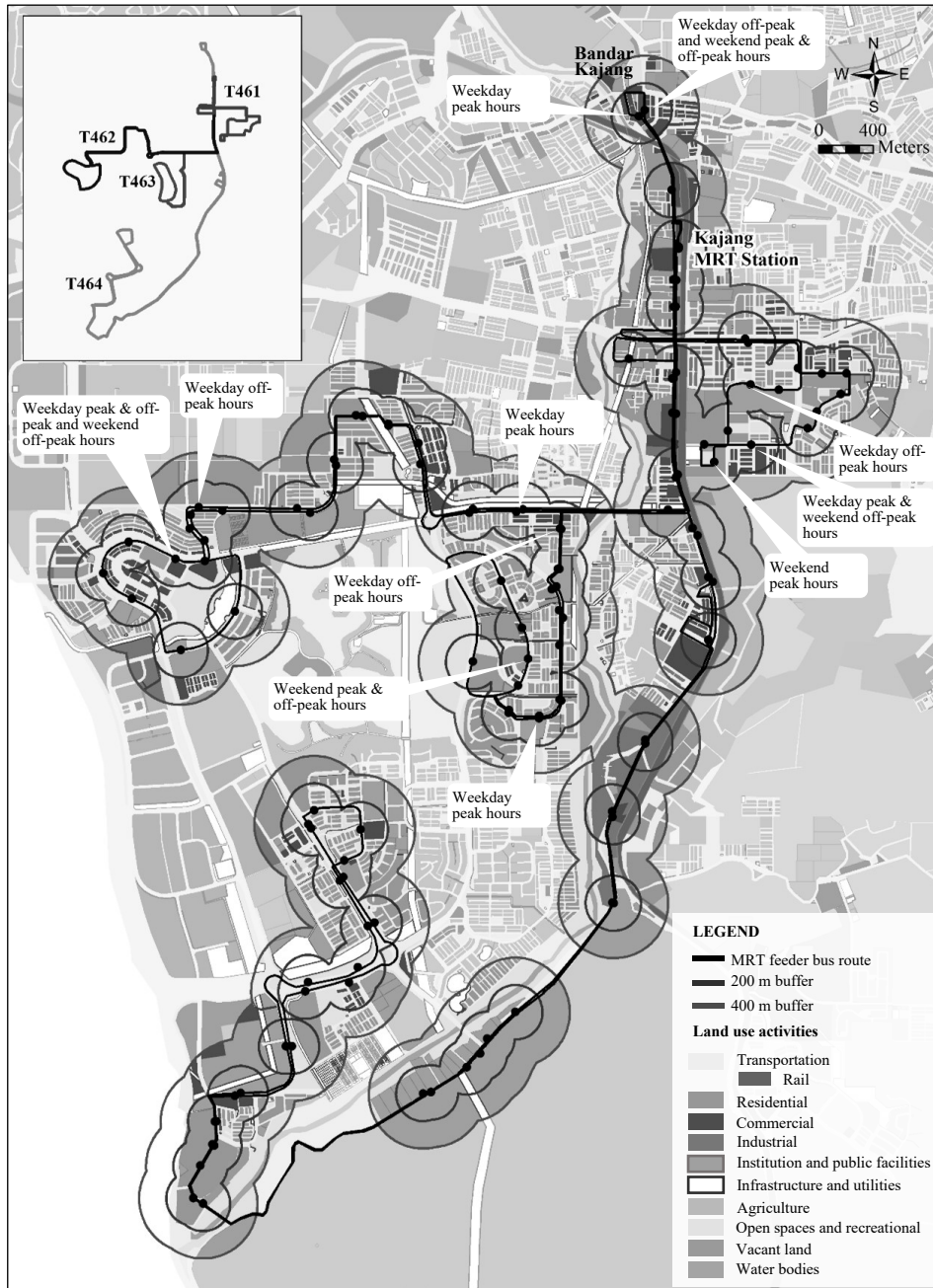


Figure 2: Land use activities around MRT feeder bus stops within 200 m and 400 m service catchment area

In practice, housing area is one of the trip or passenger generation areas in land use and ridership studies especially during morning trips where passengers commute to work and attraction areas such as location of activities. High density residential and commercial areas are said to be significant in promoting the propensity to walk as these areas have convenient environment (Kang, Jayaraman, & Keng, 2013; Abdul Aziz, 2014; Norhisham, Syamsir, Abu Bakar, & Ramli, 2020).

Highest passenger ingress

To study the demand at each bus stop, this study only extracts the highest number of passenger ingress at each bus stop on weekdays and weekends during both peak and off-peak hours. The origin (Kajang MRT Station) of route T461, T462, T463, and bus stop at Kajang MRT Station in route T464 were excluded from the analysis of land use activities at bus stop along the routes. **Figure 4** to **Figure 7** show the highest demand at each bus stop along all four routes during weekdays and weekends. **Figure 2** portrays each location of bus stops (and details of land use activities around bus stops) mentioned in the following paragraphs.

Based on Figure 4, the highest number of passenger ingress at route T461 during peak hours is eight passengers at bus stop 9 (Perumahan Seksyen 2) on weekdays and seven passengers at bus stop 7 (Flat Citra) on weekends. On the other hand, the highest number recorded at route T461 during off-peak hours is nine passengers at bus stop 5 (SK Kajang Utama) on weekdays and seven passengers at bus stop 9 (Perumahan Seksyen 2) on weekends. Since these bus stops serve residential areas and educational institutions and services, there is demand even after peak hours.

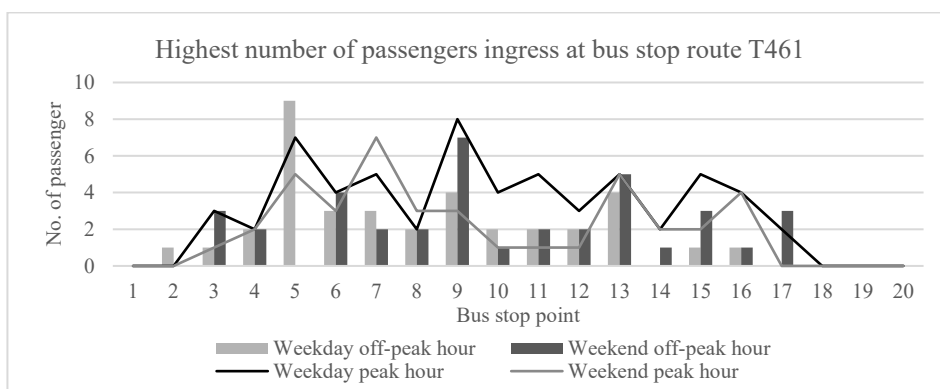


Figure 4: Highest number of passenger ingress at each bus stop route T461 during peak and off-peak hour

The highest number of passenger ingress at route T462 (Figure 5) during peak hours is eight passengers at bus stop 6 (Komersial Seksyen 4 Tambahan) on weekdays and six passengers at bus stop 17 (Kompleks PKNS Bangi) on weekends. In contrary, the highest number of passenger ingress during off-peak hours is only four passengers at bus stops 5 (Reko Sentral (Opp)), 17 (Kompleks PKNS Bangi), and 25 (Seksyen 8 Fasa 2) on weekdays, and five passengers at bus stop 17 (Kompleks PKNS Bangi) on weekends. These bus stops generate higher demand than the other areas along route T462 during peak and off-peak hours due to the presence of commercial areas and shopping complexes near these bus stops. Kang, Jayaraman, and Keng (2013) also suggested that good feeder routes should serve areas with common focal activities such as shopping malls, schools, and commercial centres.

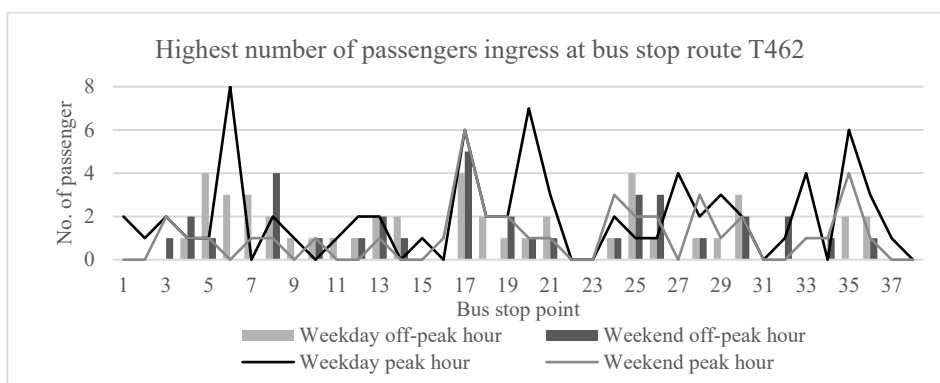


Figure 5: Highest number of passenger ingress at each bus stop route T462 during peak and off-peak hour

Based on Figure 6, the highest number of passenger ingress at route T463 during peak hours is six passengers at bus stop 11 (SK Jalan Ampat) on weekdays and eight passengers at bus stop 14 (Pangsapuri Anggun) on weekends. The highest number of passenger ingress at route T461 during off-peak hours is only four passengers at bus stops 24 (SMK Jalan Ampat (Back-Opp)) on weekdays and 11 passengers at bus stop 14 (Pangsapuri Anggun) on weekends. Bus stop 14 shows the highest number of passenger ingress both during weekdays and weekends but at different time frames. Similar to route T461, this route serves residential areas and educational institutions. Norhisham, Syamsir, Abu Bakar, and Ramli (2020) also found similar outcome of higher ridership at routes that serve these land use activities.

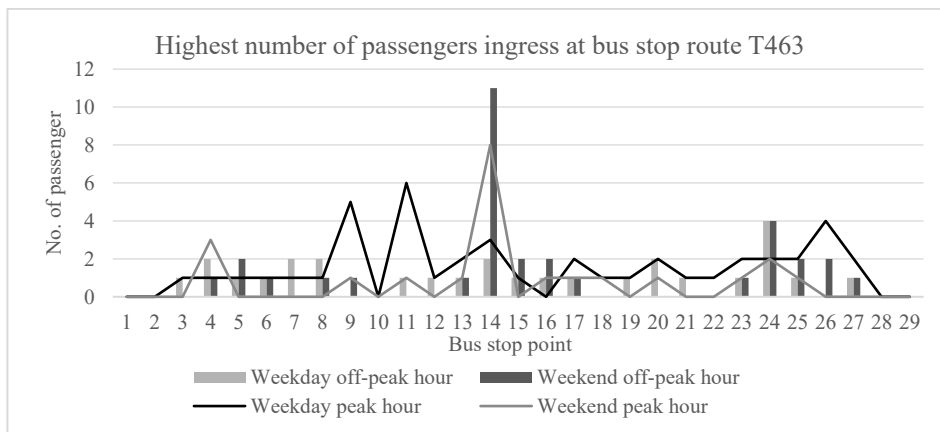


Figure 6: Highest number of passenger ingress at each bus stop route T463 during peak and off-peak hour

Based on Figure 7, the highest number of passenger ingress at route T464 during peak hours is 11 and 20 passengers at bus stop 29 and 30 in Kajang Town on weekends. Similarly, the highest numbers of passenger ingress for this route during off-peak hours at bus stop 30 (Bandar Kajang) are 13 and 12 passengers on weekday and weekend, respectively. Bus stops 29 and 30 show the highest number of passenger ingress on both weekday and weekend period but at different time frames as these two bus stops are located in Kajang city and T464 is the only route among the other three routes that serves up till Kajang city. T464 proves that it has a longer service area to suburban residences, thus overcoming the issue of low access at residential areas and providing access to town areas (Abdul Aziz, 2014).

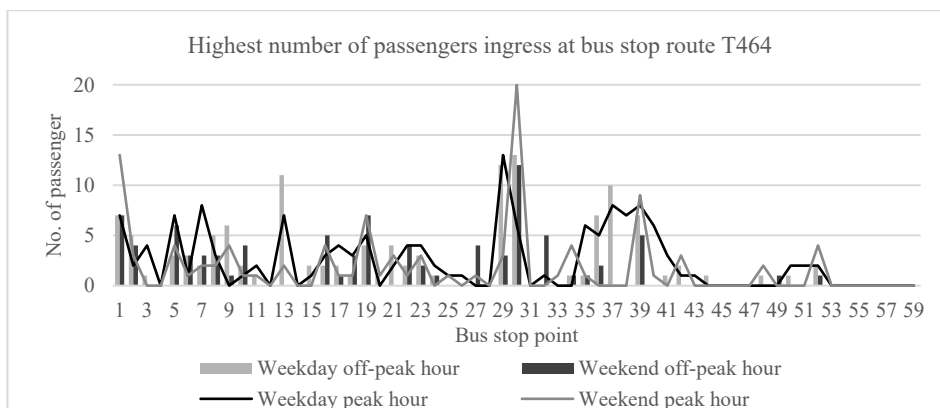


Figure 7: Highest number of passenger ingress at each bus stop route T464 during peak and off-peak hour

In average, the findings of passenger ingress in this study clearly show that the demand for MRT feeder bus at each bus stop along each route is below five passengers regardless of land use activities. We assume that the declining number of passengers at bus stops close to the MRT station is due to existing overlapping services by other bus service operators and among the MRT feeder bus itself, providing passengers better options to ride any bus that arrives first. Apart from that, it should be noted that not all passengers who ride these MRT feeder buses have the intention to access the MRT Kajang rail service as some of them egress earlier at other bus stops along the routes. Therefore, feeder bus is not only important for some passengers as their first and/or last mile mode of transportation to complete their trips, but also simply as the mode of transfer between bus stops.

In addition, the overlapping buffer presented in this study does not necessarily mean that it is accessible especially by walking because the accessible area could be smaller as barriers such as high-elevated road dividers discourage user's movement from one side of the road to the other. In most cases in this study, bus stops are provided at both sides of the road to increase user convenience and options of ingress or egress points. Currently, there is no overhead pedestrian bridge that connects Kajang MRT Station to the other side of road, and this may reduce accessibility of users to the station.

CONCLUSION

In conclusion, land use activities that exist around bus stops had influence on the feeder bus ridership. Even though the analysis involves percentage composition as part of the interpretation, it does not reflect the whole situation in the real world, as the passengers demand also depends on other land use attributes such as land use density. Coverage of land use activities alone is not enough because the density of population that resides or works varies between each activity. For example, industrial or commercial areas may experience higher demand during working hours, while residential areas may generate more passengers during the early period and end of the day. This limitation could be overcome if other land use attributes were included during analysis. However, since this study aims to evaluate the current demand, understanding the existing land use activities is adequate.

ACKNOWLEDGEMENT

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FRONTING THE BACK LANE OF HERITAGE STREET: CASE STUDY OF PETALING STREET

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Abstract

Back lanes are ubiquitously found in every city as they are a required component according to the by-laws. The intention of back lane is to serve as a service road and consequently society tends to neglect and had led to a forgotten public space due to its lack of maintenance. Thus, this has discouraged the pedestrian movement as it is unsafe because the laneway is mainly hidden from public eye. Therefore, it became a space for undesirable activities to be taken place especially for hoodlums. In line with the Kuala Lumpur Tourism Master Plan 2015-2025, that gives emphasise to revitalise forgotten spaces, this research looks into the issues of back lanes in Petaling Street with the aims to unlock its potentials. The study adopted a qualitative approach through 2 phases. The first phase is through literature review to study and understand its historical background follows by site observation through photographs and recording of the site existing conditions. The second phase is through interviews with urban planning experts and business owners to discuss the historical value, issues and parameters to revitalize the back lane. The outcome of the research divulges that revitalization of back lane and shifting the front façade to the back lane or adapting to a double façade are able to greet the public with new urban social spaces and that tenants are able to utilize and give it a new meaning.

Keywords: Alleyway, back lane, cultural heritage, pedestrian, revitalization

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INTRODUCTION

As of late, back lanes have gained more attention from the public than ever before due to the rising trend of revitalization of the lost space and green alley programmes in western countries. According to Clay & Barnett (1978) a study on neglected back lane had been done where they claim alley to be a hidden resource channelling an idea for urban residents to rethink the possibilities of the lost space. Back lane is often defined as an alleyway or a path that is tucked in between two building blocks presumably the back façade of shophouses or residential terrace house (Hess, 2008; Ismail & Ching, 2016; Wolch et al., 2010). Back lanes predominantly serve as a secondary access which its ends will be linked to the major road.

Rapid urbanization in Kuala Lumpur since 1990s has made drastic transformation in its urban landscape, especially the Central Business District (CBD) with multiple on-going mega development projects such as the Warisan Merdeka Tower and Tun Razak Exchange (TRX); sandwich in between the old and new of Kuala Lumpur has changed the landscape of its city (Draft Kuala Lumpur Structure Plan 2040, 2020). Studies have also presented that back lane and alleyways plays a vital role in forming the entire city network especially for its pedestrian to elevate social cohesion and improve street connectivity (Handy et al., 2003; Alawadi et al., 2020). Therefore, isolated back lanes in the city centre have disrupted the efficacy of the pedestrian network system where pedestrian may have to take a detour instead as safety precaution, especially for females. According to Khalid et al. (2018), respondents from his research mentioned that urban core area of Kuala Lumpur is lacking accessibility, social and economic activities. He highlighted that the city needs better quality of space planning to spike organic growth in urban area. Back lanes are valuable assets to the community as mentioned by Wan (2017) and help builds pedestrian connectivity.

To building a better city and a safe one, pedestrian network should be prioritized to mitigate one of the main urban issues namely traffic congestion, pollution and crime (Wan, 2017). According to the Safe City Programme that was launched in Malaysia in 2004, Crime Prevention Through Environmental Design (CPTED) was one of the key measures to be integrated as part of the development strategy under the city's Kuala Lumpur Structure Plan 2040 (Boon et al., 2020). Green alley programme which is consider a strategy for CPTED is explored by Weber and Schneider (2021) where greenery is integrated to alley beautification as a tool to elevate the nature experiences and well-being in city centres. Therefore, an upsurge of beautification of improving alleyways is practiced by many countries and Malaysia is not to be excluded. In fact, the government is seem actively pushing on alleyways improvement programme especially places that has heritage recognition or cultural value (Isa et al., 2020).

In 2009, with a RM20 million budget from the Ministry of Finance, Think City was established by Khazanah Nasional Berhad to safeguard the city's

heritage after George Town, Penang was awarded the UNESCO World Heritage status. From then on, they have launched a George Town Grants Programme (GTGP) to work on projects to improve on the public realm and encourage placemaking and conservation (ThinkCity, 2009). Think City has completed a total of 8 alleyways improvements thus far. In addition, since 2018 uprising initiative to revitalize back lane by Kuala Lumpur City Hall (DBKL) itself and other private organizations can be witnessed in the back lane of Jalan Alor vicinity and Brickfields (Chan, 2018).

However, Petaling Street which is situated in the secondary heritage zone had been paid little attention to. The challenges to heritage preservation were highlighted by Bindajam et al., (2020) as a response to the 'Draft Kuala Lumpur Structure Plan 2040' mentioned that there are little to no effort being made to safeguard heritage areas that had been damaged. Petaling Street known for its street hawking activities and traditional food hawkers is in gradual demise and is becoming inconsequential due to the aging community and shop vendors (Tan & Aminuddin, 2019). Moreover, constant public debates of street hawking activities that hire migrant workers sparks incongruity in cultural authenticity (Yeoh, 2014). However, the recent rejuvenation of one the back lanes tucked in Lorong Panggung which also function as public outdoor gallery, resulted in restaurants and cafes opening their back door as an entrance to visitors and thus open up the potential of impactful urban intervention. Therefore, this form the research gap on why Petaling Street is chosen as the selected site for this case study because of its constant progressive state to bridge the tangible and intangible cultural aspect of old and new.

This research explores the back lanes to be rejuvenated as to celebrate and safeguard the cultural heritage in Petaling Street. The objective of the research includes to understand the heritage value of back lane in Petaling Street which includes intangible aspects, to investigate and analyse the current condition of back lane in Petaling Street and more importantly to understand the parameters in revitalization of back lane. This research only focuses on selected back lane namely, Penjaja Gallery Tun H.S Lee, Lorong Petaling and Lorong Panggung. These selected back lanes are chosen due to their potential of revitalization based on its pedestrian connectivity from the main pedestrian nodes.

RESEARCH METHODOLOGY

This study adopted a case study approach as a qualitative research methodology whereby a specific site and area is chosen for in-depth investigation. A case-study strategy is fit for this research because it is dealing with its contextual condition (Yin, 2017).

Selection of Case Study Area

The case study area chosen is Petaling Street also known as Chinatown in Kuala Lumpur. Each back lanes in Petaling Street are historically prominent and has its own story. The back lane scene of shophouses in Petaling Street are homes to street traders and food hawkers that has been around since the 90s. In 2019, one of the back lanes namely, Lorong Panggung located at the fringe of Petaling Street went through a facelift that has gentrified the area attracting various visitors and tourist back to Petaling Street. However, the rest of the back lanes in Petaling Street especially Penjaja Gallery Tun H.S Lee and Lorong Petaling deserve more attention for uplifting and revitalization.

The data collection is mainly divided into two phases: 1) Preliminary Study 2) Semi-structured interviews.

Preliminary Study

Literature review is carried out before field observation to research and understand the background of the site and its recent development. A preliminary site investigation was done to survey the selected back lanes in Petaling Street. Site observation is used as a tool to discover how these back lanes are currently being utilize and its existing conditions as there was no data available. There are total of 5 back lanes found in Petaling Street. Three back lanes are chosen for this study based on their cultural values, pedestrian potential and current happenings - Penjaja Gallery Tun H.S Lee, Lorong Petaling and Lorong Panggung.

A structured observation was carried out by using the sustainability model as a guide for the checklist which includes three components of environment, society, and economy.

Semi-structure Interview

The interview with business owners was carried out with the objective to investigate the pros and cons of having back lane as part of the front façade and entrance to their business premise. The interview was separated into two parts, elite interview and feedback interview. Elite interviewing involves affiliate experts or authority in capable of providing comprehensive answers to this research (Gillham, 2000). An elite interview was conducted with respondents from Think City that has completed revitalization of back lane projects in the Kuala Lumpur vicinity. The second elite interview was carried out with a respondent Management that has completed the recent Little Demon Alley Project. Secondly, feedback interview was carried out with shophouses owners that effected by the recently completed Little Demon Alley project and two owners of shophouses that having double frontage entrances on Lorong Panggung. Among the business occupying the shophouses are as in Table 1.

Table 1: List of Feedback Interviewee
Source: Author

Shopfront facing	Name of Shop	Nature of Business	Interviewee
Lorong Panggung	Concubine KL	Restaurant & Bar	Co-Founder
Jalan Petaling	Bubble Bee Cafe	Restaurant & Cafe	Barista
Jalan Petaling	Da Bao	Restaurant & Bar	Founder
Jalan Panggung	Kaffe 16	Cafe	Senior Barista
Jalan Panggung	Luckin Kopi	Restaurant	Manager

FINDINGS & DISCUSSION

First Case Study: Penjaja Gallery Tun H.S Lee

Historical Value

Based on literature review, Penjaja Gallery Tun H.S Lee was known as Madras Lane for having a Madras Theatre which was burned down in 1979 (Bernama, 2019). There was no tangible heritage left behind. The empty plot of land functions as car park, local wet market and home to food hawkers that has been around for more than 50 years (Lee, 2019). Therefore, Penjaja Gallery Tun H.S Lee is best defined as an intangible cultural heritage value due its traditions and practices among the community which are the wet market and the street food hawker. The locals especially the baby boomer’s generation that grew up in the area would always go back for its hawker delicacy even though they already have move out of the city into the suburbs.

Current Conditions

The current condition of the back lane is overall unpleasant. The dampness from the wet market and rubbish from pedestrian resulted in an unhygienic condition. Lack of lighting and ventilation due to the metal roof supported by very rusty steel structure that is providing shade resulted in the back lane being damp creating a foul smell. This resulted in the wide use of artificial lighting by vendors. Compounded by restricted Covid19 Movement Control Order, the overall environment is slowly dilapidating as the market is less frequented by regulars.

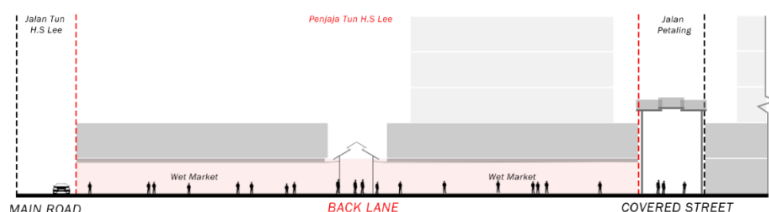


Figure 2: Cross section across back lane of Penjaja Tun H.S Lee

Source: Author



Figure 3:
(L) Unwelcoming entrance from Jalan Hang Lekir, (R) Damp floor at the wet market
Source: Author

Second Case Study: Lorong Petaling

Historical Value

Lorong Petaling, a back lane famous with its street hawking culture that start as early as 5am in the morning namely Pasar Karat. According to the Kuala Lumpur Hawkers and Petty Traders Association multiple controversy against the flea market had been raised due to the questionable items sold which ranges from antiques, old handphones, pots and pans, clothing, shoes etc and also concerns of blocking emergency exits. There were plans to rebrand the market by DBKL in 2017 by streamlining the lot size, repainting the murals and ensuring the legitimacy of the goods sold (Lim, 2017) but yet to happen.

A long time Teow Chew porridge vendor operated by 3 siblings who has occupied the alley for half a century (Lai, 2019) continues to operate with its non-permanent plastic sheeting roof and just a few tables and chairs to maintain its traditional look. Similar to the first case study of Penjaja Tun H.S Lee, the antique market of Pasar Karat and the street food vendors have made their mark in Lorong Petaling for decades, establishing the intangible cultural values of the street.

Current Conditions

The current condition of Lorong Petaling is overall well maintain but it gets quiet in the late afternoon when there is minimal activity and pedestrian flow. The marking of the lots on the floor for the vendors in Pasar Karat can be seen however, the conditions of the murals are fading and peeling off. The busy hours occur only in the morning until afternoon. The use of space in the evening is mostly used as a car park and one of the restaurants utilizing the back lane as a spill over space for grilling (Figure 4)



Figure 4: Condition of Lorong Petaling.

Source: Author

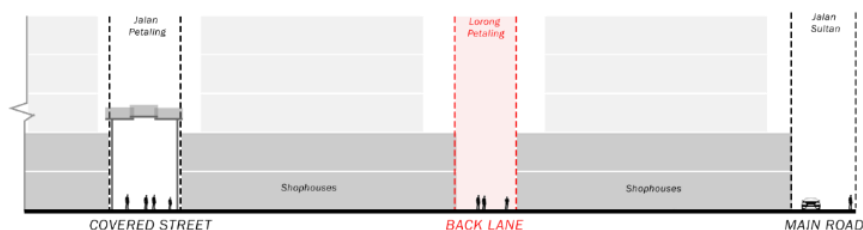


Figure 5: Cross section across back lane of Lorong Petaling.

Source: Author

Third Case Study: Lorong Panggung

Historical Value

The third case study is Lorong Panggung also known as ‘Little Demon Alley’ as narrated by one of the respondents for its three historical tales. Firstly, it was the playful children making noises that would disturb the neighbour, secondly was the said ‘entertainment’ establishment where the gang members and brothel were given names such as ‘gambling ghost’, ‘smoking ghost’ and ‘whoring ghost’ resulted in the name ‘Little Demon Alley’.

A little local coffee shop also known as kopitiam called Ho Kow Kopitiam tucked in one of the lots in the back alley has been operating for almost 60 years ago with the usual traditional spilled over area serving Nanyang breakfast to regulars. Another Chee Cheong Fun stall operating in the mouth of Lorong Panggung is also a go-to spot for locals. When conducting community engagement, the owner of Chee Cheong Fun shared with the respondent that he was living right at the corner of Lorong Panggung when he working as an electrical mechanic and had remained there for decades. In 1981, he eventually moved out from the city with his family but went back to Lorong Panggung to set up his Chee Cheong Fun store. Unfortunately, the street hawker has permanently closed due to a fire outbreak in the end of 2020.

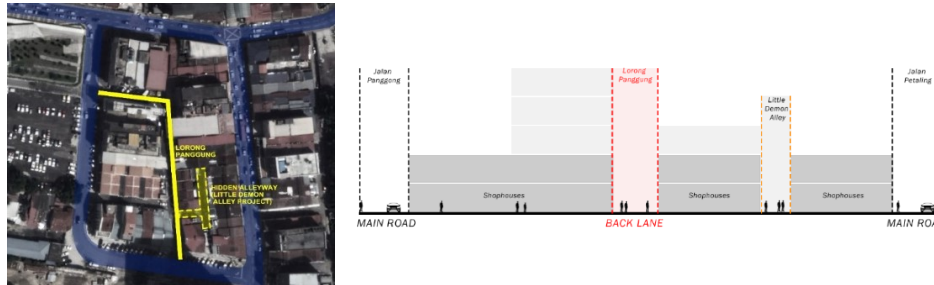


Figure 6: Location of hidden alleyway “Little Demon Alley”.
Source: Author

Lorong Panggung compared to the first and second case study differs since it has four shophouses with double frontage, one facing the main road another the back lane. These shophouses are only halved length compared to typical adjacent units, no air well or courtyard and no five-foot way at the main entrance. However, a hidden alleyway is sandwiched in between these shophouses breaking them off and creating a courtyard space within. These hidden alleyways have been left abandon for the longest time with rubbish and debris everywhere. A revitalization project was launched that took 8 months for completion involves cleaning up the dilapidated area, restoration of the 4 shophouses and building an arch bridge from the main entrance.



Figure 7: Before and after revitalization of “Little Demon Alley”
Source: Bai Chuan Management

A total of six mural paintings are introduced as part of the revitalization strategy to attract pedestrians. The art murals are carefully plan and selected to reflect on the daily lives of the early Chinese settlers in the back lane, as refer to Figure 9. Each of these murals incorporate with a QR code next to it which allow visitors to listen to a recording of voice clip tells the tale of the past. 10 shophouses that shared the Little Demon Alley are rented out to carefully selected tenants that is able to bring value and contribute to the essence of the area. After the revitalization of the hidden alleyway, it was very well received by the public and became a new attraction that has attracted many urban dwellers to revisit the lost roots of Petaling Street. (I. Lim, 2019)

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Figure 8: Art murals depicting the daily life in the back lane of early Chinese settlers
Source: Author

Current Conditions

Lorong Panggung is inviting and pleasant, mostly due to the revitalization project that has since become a tourist attraction for foreigners as well as locals. The back lane is clean and odourless, comfortable to be wandering around. However, only the front portion of the back lane is more densified in terms of pedestrian movement, the back part remains quiet with no activities.



Figure 9: Before and after revitalization of the shophouses facing Lorong Panggung
Source: Bai Chuan Management

The four double fronted shophouses are all restaurant, bar and café that started their business after the revitalization of the Little Demon Alley as many entrepreneurs and business saw potential in the new area. One of the main concerns that brought up by the business owners for having both front and back entrance is crowd control and the need to constantly monitor the back entrance, facing issues such as passer-by using it as a short cut thus call for security concern.

Parameters in Revitalizing Back Lane

Penjaja Gallery Tun H.S Lee and Lorong Petaling are two case studies that require further revitalization. However, Lorong Panggung case study highlight

parameters for successful revitalization of back lanes - understanding its historical and cultural importance, current issues, community engagement, planning programmes and maintenance. Research on historical and cultural background of the back lane either through archival research or oral history establishes desired culture value of the place, a *genius loci*. Baseline study is necessary to understand the current issues such as homeless and drug addicts that are often found in the back lanes, as in Petaling Street example. Whereas rigorous community engagement identifies current and future needs of the community and how to improve existing conditions before any revitalization takes place.

Crafting programmes and activities after the revitalization helps to promote and at the same time as part of the community engagement. For example, Lorong Fest Festival to celebrate the cultural heritage of Penjaja Gallery Tun H.S Lee with art exhibition and posters to capture the stories of the long-time food vendors. Little Demon Alley are often used as an outdoor exhibition space especially during any Chinese festivities. After revitalization, maintaining the back alley is the key factor to a successful back lane project that requires financial assistant either from the community, sponsors, or authority.

CONCLUSION

This research has unveiled the importance of the intangible cultural heritage of Petaling Street through its back lanes stories that have yet to realize its full potential. The image and identity of Petaling Street is already tarnishing and will need to be carefully rebuilt to par up with new urban development especially with the on-going mega development of Merdera 118 and the increase foot traffic from the MRT interchange station that begun in the end of 2016. Revitalization or an uplift is very much needed to improve the back lane condition especially on the back lane of Penjaja Tun H.S Lee and Lorong Panggung. With its intangible historical footprint of traditional street hawkers and markets the vendors deserve a better space. Revitalizing these back lane will not only activate the lost space but also encourage the use of public space that will contribute to the slowly gentrified Petaling Street when new business and cafes starts blooming in Petaling Street. This can be seen from the case study of Lorong Panggung, in the hidden alley of Little Demon Alley revitalization project that set an example of how a revitalize the alleyway can boost economical means and bringing back the locals to revisit Petaling Street. The result from this research will highly encourage back lane revitalization especially in historical sites to activate its lost space to draw in urban dwellers and shop owners to treating the back entrance as equal importance as the front entrance.

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PERSPECTIVES ON MALAYSIA'S LACK OF IMPLEMENTATION OF GREEN BACK LANES

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Abstract

Malaysia has been utilising green back lanes since the '90s. In spite of the several benefits of these lanes, such as the formation of active spaces, decrease in runoff water, and visitor attractions, green back lanes are yet to be deployed in the residential regions of Malaysia, prompting the question as to why these lanes have not yet been installed extensively. The objectives of this research work were: to determine what experts opined regarding the installation of green back lanes in the country, study the scenarios which caused the absence of implementation, produce a report showing the outcomes and analysis, and offer suggestions. The researcher deployed the interview strategy for ascertaining the views and standpoints of architects, town planners, maintenance staffs, project managers, and marketers on the dearth of green back lane installation. The research emphasises on the aspects of cost, maintenance, and safety.

Keywords: back lane, green back lane, green alleys

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INTRODUCTION

This study presents a critical perspective on the inadequate deployment of green back lanes in Malaysia and identifies three crucial concerns. The first concern is that the green back lanes are exclusively installed in high-cost accommodations and affluent strata housing in Malaysia. Therefore, there is a bit of a misunderstanding among the communities that green back lanes are extremely imprecise spaces. The next concern is that several back lanes in residential areas have been unsafe for the inhabitants. The residents believe that lanes which are accompanied with gentle landscapes and lights are much safer. The green back lanes make the inhabitants feel insecure as someone can pass by from the backside of their homes. The third concern is that the presence of a green back lane makes it tough for public utility suppliers to gain access to the property for building, repairing, and up keeping utility lines. Hence, infrastructure and upkeep could be the aspect driving the dearth of implementation of such lanes in the country.

Thus, to accomplish the primary objective, two goals are formulated as follows:

- i) To ascertain the opinion of professionals on installation of green back lanes in Malaysia.
- ii) To study the aspects of safety, maintenance, and cost in the installation of green back lanes in Malaysia.

BACK LANES: AN OVERVIEW

A back lane is a thin road located between rows of constructions, utilised as a general public track (Tawil, Lias, Usman, Yusoff, Che Ani & Kosman, 2013). It is also called as alley. It is an unfavourable street which is typically been ignored by the residents. This statement is supported by Li (2014), Ford (2001), and Aniza, Nurhayati, Mohamad, Rosniza and Aliyah (2016).

Table 1: Back lanes as unutilised spaces

Author (Year)	Statement
<i>Li (2014)</i>	Alleys or back lanes used to be places that were easy to be forgotten in such discourse
<i>Ford (2001)</i>	Alleys became displeasure because they were threatening, risky, and unsound places
<i>Aniza, Nurhayati, Mohamad, Rosniza and Aliyah (2016)</i>	The back lane area of the house is not a potential quality space for daily activity and be neglected as positive spaces

These statements indicate that before today, a majority of individuals paid little attention to the back lane on the limited area, which is typical for a residential terrace region

The Planning Standard and Guidelines offered by PLANMalaysia (JPBD) describe the back lane as the separation between the rows where houses are constructed. Malaysian laws address the back lane: Street, Drainage and Building Act 1974 (Act 133). Subsection 69 (1), Street, Drainage and Building Act 1974 [Act 133] specifies a back lane as a built or planned accessible area (or its parts), including entry points and estate specified for present or future use as an alley, including multiple alleys, drainage system, and other aspects linking a back lane. Act 133, Section 68 specifies local regulations where a back alley is declared open for public use. Typically, when a rear hallway is provided to the authorities, it is designated a public area regardless of its form. Jabatan Kerja Raya (JKR) specifies that a back lane (including those behind buildings) is open for use by public transport based on specific rules.

FACTORS THAT CONTRIBUTE TO THE LACK OF GREEN BACK LANE IMPLEMENTATION IN MALAYSIA

Maintenance of Green Back Lanes

As the green back lanes are implemented under strata landed titles, they need to conform to specific acts like the Housing Developers (Control and Licensing) Act 1966, Strata Titles Act 1985, National Land Code Act 1965, Building and Common Property (Maintenance and Management) Act 2007, and the newest Strata Management Act 2013. Strata landed titles are regulated under Strata Management Act 2013 (SMA) and the Strata Titles Act 1985, which also safeguard and control land parcels having strata titles. These guidelines manage the division of constructions into plots and strata title lands, along with their management and maintenance. Payment of sinking fund and maintenance fee, for instance, is required under SMA 2013. Every parcel holder is exclusively accountable for the maintenance and overhaul of his/her parcel along with any accessory plots. The upkeep of the collective plot is a joint obligation of all parcel holders. Thus, a medium is necessary to aid the Management Corporation's or developer's appropriate regulation and upkeep of the common possessions.

A back lane should help avert the proliferation of fire and aid fire operations. It should also function as an escape path as well as a space to navigate in times of emergencies. The Fire and Rescue Department has mandated a minimum stipulation of 3,048 meters (10 feet) as victim rescue access and for dousing fires from the backside of the structure. Therefore, the written permission, called planning permission, of the Local Planning Authority is required by the implementers. Planning permission is required following attainment of land conversion agreement if the building proposals are to move forward. The question is: how will maintenance be carried out in the green back lanes, will it be costlier, and will people be ready to help in the upkeep of the green back lanes and shell out the maintenance fees?

Safety

Experts have expressed contrasting opinions regarding safety of residents' safety when back lanes are provided. The favourable view certainly comes from government organisations like PLANMalaysia, which greatly recommend installation of back lanes as a place to warrant owners' privacy between the rows of residential properties and as a location for calm illumination and ventilation among buildings so as to create a favourable and wholesome environment. Conversely, as per Kuo, Bacaicoa and Sullivan (1998), people felt most apprehensive in heavily covered landscape regions and relaxed in open and well-preserved areas. The safety factors pertain to not just physical but also non-physical aspects like culture and religion. The influence of non-physical aspects in the dearth of installation of green back lanes is because of the country's culture and people's reluctance to acclimatise. As noted by Bavani (2020), the inhabitants at Taman Bukit Indah complained that back lanes are not safe and might cause health issues.

High Cost

The socioeconomic standing of a residential zone too has an influence on the pricing. Nevertheless, new information has been uncovered, considering the resilient green cover protecting the neighbouring areas. Hardie and Nickerson (2004) asserted that construction cost involving tree protection could be up to 5.5%; however, builders could offset their investment by demanding additional maintenance charges and command a better market price. Crompton (2001) indicated that residential properties with better natural aspects, including proximity to open areas and parks, are about 8% to 20% more valuable than similar properties. The price premium starts declining as the distance from such expanses approaches a half-mile.

METHODOLOGY

Considering the Movement Control Order (MCO), semi-structured interviews were conducted through a Web-based platform. Maximum Variation Sampling was utilised for choosing samples from every unit of study. This method is based on purposeful filtering instead of random selection. It encompasses choosing a small number of samples with an assortment of attributes for attaining a varied outcome. Consequently, the quality of the outcomes assumes priority over the number of respondents. An individual with the knowledge of administering a project or installing green back lanes was selected as the sample. The researcher will obtain a variety of standpoints on the lack of installation of green back lanes in Malaysia, given the assortment of sample attributes.

As the participants responded in Bahasa Melayu, the transcription procedure was quite challenging. After all transcripts are collected, the researcher will carry out a thematic analysis. This is a technique of methodically defining

all the key ideas which surface from the interviews and then classifying and cultivating them into generic themes. Partially-structured interviews require even more time than the structured ones because of the need to develop coding frames and perform content assessment on a huge number of interviews. The questioner will either write the replies or record them on a tape. Hence, in this research, the data processing is performed manually instead of using a computer. It means that all the data acquired from the interviews has been converted into English, and the key highlights from all the interviews of the samples have been assembled into one topic.

Each participant was allotted a code. For instance, 'GTP' represents participant number 1 who belongs to the category of government sector town planner.

Table 2: Code references based on the respondents' backgrounds

Code	Respondent's Background	Number
<i>GTP</i>	Government town planner	3
<i>PTP</i>	Private town planner	1
<i>PAR</i>	Private architect	3
<i>PPM</i>	Private project manager	1
<i>PMN</i>	Private maintenance worker	1
<i>PMK</i>	Private marketer	1
Total		10

DATA ANALYSIS AND RESULT

The outcomes attained from the assessment of the responses of the participants have resulted into two primary themes, which are landscape back lane and active back lane. The following table shows the themes derived from the responses of the participants.

Table 3: Respondents' responses on the definition of 'green back lane'

	%
Active Back Lane	
Back lane as exercise spaces	80
Back lane as tourism attractions	60
Back lane as business site	20
Landscape Back Lane	
Back lane fill with soft scape	20

Three parameters that have caused the lack of Green Back Lane's implementation in Malaysia have been examined to attain the objectives. First one is the maintenance. The second one is considerations for safety. Finally, the third

parameter is the cost. The following table shows the themes and subthemes derived according to the responses of the participants.

Table 4. Respondents' responses on causes lack implementation of the green back lane in Malaysia

	%
<i>Maintenance</i>	
Involvement of management body	100
Complicated approval building process	80
Demanding maintenance	30
<i>Safety</i>	
Physical Safety	100
Visual Privacy	80
Emotional Safety	70
<i>Cost</i>	
Maintenance fees	100
Aesthetic fees	100

The assessment of the outcomes leads to the answer for the study of the 3 objectives. The study also demonstrated that cost, safety, and maintenance all proved to be the factors leading to the lack of the implementation of the green back lane in Malaysia. All the participants had different viewpoints. For the maintenance parameter, 100% were in agreement regarding the complexity of the green back lane process. Also, 100% of the participants agreed that the lack of green back lanes implementation in Malaysia is because of management involvement, 80% of them agreed that the building approval procedure is tedious, and 30% of them agreed that the green back lanes need a great deal of maintenance. In case of safety factor, the absence of green back lanes implementation in Malaysia can be attributed to the fact that 100% of the participants agreed on physical safety, 80% of them agreed on the visual privacy, while 70% of them agreed on the emotional safety. Also, 100% of the participants agreed that cost was a factor in the lack of green back lane implementation in Malaysia.

DISCUSSION OF FINDINGS

Advantages of Provision Green back Lane

Most of the respondents considered green back lanes to be an active area. As per 8/10 respondents, a green back lane can be defined as a back lane with active spaces. Even if 2/10 respondents would agree with this, they also added that the greenery maintained in the back lane would welcome others to come and participate in various activities.

As mentioned by PAR1, a green back lane can be regarded as a fun and lively back lane, which invites people to do plenty of activities in the parks. Also, an active green back lane is good for community centres, offering numerous benefits to the community overall, and even for senior citizens. This also created a spot for people to do various things in the green back lane. For instance, during COVID-19 pandemic, people were restricted from going out in public, which also resulted in various health issues and socioeconomic issues like higher divorce rate as well as mental health drowning. With green back lanes, senior citizens were able to take a daily stroll in proximity to their home in order to maintain their fitness. Using the green back lane also helped Alzheimer's patients.

As per GTP2, green back lanes allowed people to take a break from negative social environment. People who were trapped at their homes during Movement Control Order (MCO) tended to get more stress. In such a situation, green back lanes helped facilitate social interactions as people could take a walk or chat with the neighbour near their house area. As per PPM1, green spaces were used as active places since individuals who are used to visiting parks and open spaces frequent were three times more likely to attain prescribed levels of physical activity versus non-users. For exercise, people tended to prefer nearby parks and open areas that were more appealing and open.

Since concrete and asphalt materials are lesser in green back lanes, this allowed growing certain plants and vegetables, performing mural painting, and also setting a few chairs and picnic tables in the area for activities. As per PTP4, the project also offered 'a beautiful walkable, public area to attract more crowd towards local businesses. For example, mural paintings displayed in the back lane at Bandar Maharani in Muar, Johor, gave a more positive, clean and bright environment to the community. With this example, green back lane will also attract a greater number of tourists, which would eventually boost local business economy, as well as simultaneously accomplish the city's goal to get revitalised.

Lack of Green Back Lane Implementation in Malaysia

As per the study, two interrelated phenomena that could have resulted in the above-mentioned issue were: 1) planning and maintenance; 2) religion and culture. However, the major contribution was from planning and maintenance.

With regards to planning and maintenance, extended approval procedure is regarded to be a key factor. For instance, the concept of green back lanes was used for strata landed houses instead of non-strata landed houses, and the building approval process involved all of the town planners. As per GTP1, GTP2, GTP2, and PTP1, implementing green back lanes required involvement of various management bodies and included a complex approval process, which was in line with the statement of Marzukhi et al. As per (2020), getting approval for the landscape with regards to the back lane plan was regarded to be a challenging stage in the Malaysian planning process. A certain gap is required amongst the

rows of the buildings in order to prevent fires from spreading and making the task easier for firefighters, in case a fire breaks out. During emergencies, it also acted as an escape route without congestion. Not just that, the back lane is also regarded as a path forward for utilities and infrastructure. Thus, implementers need to keep space for a green back lane in order to offer alternate routes during an emergency or to be used as alternative utility route. The main cause of delays in refurbishing such projects is the complicated approval system for getting authorisation from the local government. A delay would add up to the project's anticipated cost. This may explain the reason why even though the adoption of green back lanes in Malaysia goes back to the 1990s, not much significant residential development has happened in terms of utilising them. As per GTP2, greater efforts are needed in the submission process. This includes various components, such as construction plan approval, submission of development permission application, infrastructure plan approval, and other procedures mandatory for the verification of the building's Principal Submitting Plan (PSP) complying to all government rules and regulations. This is because of the developers' need to persuade the departments of alternative emergency and utility route, including technical drawings and designs and, and also convince them on how maintenance would be established.

Another factor associated with the first phenomena would be the cost of maintenance. Also, these maintenance costs can change at any moment. The primary responsibility pertaining to MC includes maintenance and administration of the common land, and also any property that has been entrusted towards it, in a proper and serviceable condition. The Commissioner of Building (COB), Managing Agent, the Joint Management Body, and the Management Corporation are all partners associated with the strata property management, along with areas of building repair, office administration management, inventory management, coordination and processing of operation and maintenance costs. Table 3 shows the maintenance activities that have been highlighted by a respondent (PMN1). Due to this, the residents refrain from paying higher greater maintenance costs, which is the main reason for the poor adoption pertaining to green back lanes in Malaysia. This finding was backed by Hardie and Nickerson (2004), which stressed upon the statement that even though construction costs for lots with trees conserved could reach up to 5.5%, developers could earn back their money by increasing the costs of maintenance and thus also get higher market rates. Cost factor associated with high maintenance can be attributed towards the lack of effectively implementing green back lane in Malaysia. Maintenance fees have been seen to impact the buyers' perceptions towards the house, because of the associated exclusivity and expensiveness. This list was provided to PMN1 in order to get information regarding Malaysia's green back lane maintenance activities as well as frequency. The table below presents the list and answers:

Table 5. List of maintenance frequency and activities according to PMN1

	Maintenance Activities	Frequency
Native Landscaping	Check for and rid unnecessary vegetation, such as weeds	Every 3 months or as needed during growing season
	Remove and replace any dead and diseased plants	Every 3 months or as needed
	Thin crowded vegetation	Every 3 to 4 months
Permeable Pavements	Leaves, lawn clippings, mulch, sediment, and litter can all be checked.	Every 2 to 3 months
	To better avoid clogging and ensure water flows across the pavement, sweep it (consult product recommendations)	After heavy rain or once a year
	To prevent unwanted plants in street spacing, maintain any adjacent planting areas.	Every day
	Inspect the pavement for sunken, broken, or incomplete units/sections and repair or substitute the aggregate between the pavers as required.	Once a year
Greenways	Check to see if the water is drained correctly and not ponding.	Often (once a month) or as needed after rain

The phenomenon pertaining to religion and culture has a role to play towards ineffective implementation of green back lane. This finding was in line with the earlier study carried out by Bavani (2020). As per most of the respondents, which included consultant and local authority, the provision of green back lane also needs to consider other people's backgrounds, such as status, religion as well as cultural beliefs. In Malaysia, the kitchen is normally built near a back lane where, with regards to green back lane housing, people may actively walk passing through the kitchen. In such case, Muslim women stated their concern of feeling uncomfortable when people walking by would see them cooking in the kitchen. They were worried if the maintenance workers or neighbours would see their *aurat* when they are cooking at the kitchen. This is because they believe that Muslim women need to protect their *aurat* from the sight of non-*mahrms*. With regards to peoples' belief pertaining to Feng Shui views, the kitchen is regarded as a sign of prosperity, and thus any concerns that could hinder the peace need to be dealt with caution.

Concerning the mentioned observations, respondents GTP2 and GTP3 indicated the challenges about creating green back-lanes for residential areas where building age exceeds ten years. Citizens know the benefits of creating green back-lanes and the health aspects of green lane environments; however, there is a resistance against such implementations. Moreover, in contrast with

planned residential regions, it is challenging to renew back lanes after obtaining approval for older residential regions.

Strategies to Encourage Green Back Lane Implementation in Malaysia

This research identified two emphasis areas that should be employed to motivate people to create green back-lanes: 1) Indulging residents and creating a system using the bottom-up scheme; 2) Creating a green back-lane knowledge base.

Involving the locals comprises the bottom-up technique where the objective is to reduce maintenance expenditure. The GTP1 indicates that the green back-lane concept was initiated by Jawatankuasa Kemajuan dan Keselamatan Kampung (JKKK) (also called Resident Association) to create a green aspect about the back lanes. In Indonesia, the Depok City is an appropriate example of residents' cooperation to create a green back-lane. Residents collaborate to create such lanes, negating the need to involve many administrative units, simplifying the system and reducing costs. Moreover, it is feasible to reduce maintenance costs too. Social aspects like the religious and local way of life can be smoothened because neighbourhood agreement is critical.

In the handbook context, the administration should hand over the reckoner for references concerning builders and develops to motivate sustainable architecture and landscaping methods to help reduce floods, create a maintenance system, cost plan, and implement Crime Prevention Through Environmental Design. The Chicago Department of Transportation (CDOT) launched the Green Alley Handbook to motivate the adoption of best management processes (BMP) for Chicago and neighbouring areas' alleys. The department also wanted to address infrastructure issues caused by higher temperatures and precipitation.

CONCLUSION

It is observed that green back-lanes provide several environmental, systematic, and social advantages; however, there is a lack of widespread adoption because of several reasons. Cautionary processes and appropriate action have been established for administrative focus to facilitate the implementation of this social benefit. These actions are expected to increase green adoption, which is critical for the present environment. People have powerful ideas and know the benefits and consequences; however, several aspects hinder the implementation of such ideas.

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