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## **A SUSTAINABLE CARBON FOOTPRINT ANALYSIS FOR THE CITY OF KUANTAN, PAHANG MALAYSIA**

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### **Abstract**

Carbon footprint is one of the critical elements in assessing the level of sustainability of an urban area or forest area. Cities are a vital contributor to climate change with 75 percent of global carbon emissions are from cities. Transportation, buildings and urban activities are among the most critical contributors of greenhouse carbon emission globally. The study aims to identify the current condition of total carbon produced in the study area. Geospatial and observation approaches with social distance and standard operation procedure were used during the data collection and fieldwork at the study area. Mapping analysis and survey were used to analyse the activities conducted and the carbon consumption level by visitors of the area. Preliminaries' findings indicate that the visitors' activities and carbon consumption were high within the existing green area at Esplanade Kuantan, Pahang.

**Keywords:** Kuantan, Carbon Footprint, Esplanade Recreational Park

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## **INTRODUCTION**

Climate change has been recognised as the most pressing environmental problem the world will face in the 21st century (Tangang et al., 2012), including in Malaysia. The most affected areas are cities and urban areas with various human activities and rapid physical development that contributed to the rise in global warming and increase in the greenhouse gas emissions. Cities are responsible for 75 percent of global CO<sub>2</sub> emissions, with transportation, concrete buildings and human activities among the most critical contributors (UNEP, 2020). The article will describe the various programmes and initiatives undertaken in the city of Kuantan, situated in the state of Pahang, in addressing the carbon usage in the city. Pahang is the third largest state in Malaysia, with a population estimated at 7.1 million people, and the City of Kuantan is the capital city of the state. According to the State Pahang government (2020), the Kuantan City population was estimated at 341,000 people and the City Council administrative physical area covered around 341 km square with four Mukim, namely Kuala Kuantan, Ulu Kuantan, Beserah, and dan Sungai Karang (MBK, 2021). Kuantan was gazetted as a city status on 08 August 2019, many initiatives and programmes were carried out to minimise the carbon footprint of the city with the provision of green areas as one of the main initiatives undertaken by the local authority.

## **RESEARCH BACKGROUND**

Carbon footprint is defined as the demand for biocapacity required to sequester (through photosynthesis) the carbon dioxide emissions from fossil fuel combustion (ScienceDirect, 2013). Controlling carbon footprint is an essential aspect nowadays with some countries using this approach to ensure urban development's sustainability. The carbon footprint levels of a city can be controlled and minimised with the planting of certain trees or plants and the increase of planned green spaces in the area. However, there is a limited open space in Kuantan city which can be a challenge to reduce the carbon footprint of the area. Certain plants and trees that can control carbon absorption have been increasingly popular in residential areas, which can improve air quality and reduce air pollution and greenhouse gases (Franek & Jarský, 2021; Shishegaran et al., 2020). For Kuantan, air quality has become one of the most crucial elements in improving the city's image as a sustainable city in Malaysia. Therefore, a simple indicator yet practical approach is by identifying existing planted trees around the city in terms of CO<sub>2</sub> absorption ability.

Generally, table 1 indicates CO<sub>2</sub> absorption ability according to the individual plant. Samanea saman is known as 'hujan-hujan', with a daily CO<sub>2</sub> absorption of 28,448.39 at the highest daily absorption compared to other plants. The CO<sub>2</sub> absorption by the plant will be used as the primary approach in the estimation of the calculation of air quality in the study area.

**Table 1:** CO<sub>2</sub> Absorption Ability According to the Plant

No	Scientific Name	Local Name	CO <sub>2</sub> Absorption Capacity (Kg/Tree/Day)
1	Samanea saman	Trembesi (Hujan-Hujan)	28,448.39
2	Cassia Cassiasp	Cassia (Golden Shower)	5,295.47
3	Canarium odoratum	Kenanga	756.59 4
4	Dysoxylum excelsum	During	720.49 5
5	Ficus benyamina	Beringin	535.9
6	Fellicium decipiens	Dlium Kerai payung	404.83
7	Pornetia pinnata	Longan	329.76 8
8	Swettiana mahagoni	Mahagoni	295.73
9	Adenanthera pavoniana	Saga	221.18

*Source: Nurul Akmar & Mastura, (2017)*

## METHODOLOGY

Quantitative research methods with Geospatial and survey analysis were used to identify the CO<sub>2</sub> status in the study area. In terms of Geospatial analysis, calculation was made based on the trees covered area which indicates by the green space provision. As for the ground survey data collection method, visitors' form was used to calculate the volume of visitors daily from 8.00 am to 10.00 pm. Visitors' presence was crucial for the study, as each visitor can contribute to the calculation of CO<sub>2</sub> emissions. According to Grey & Deneke (1978) and Idris et al. (2017), the carbon produced by the respiration of the population in each zone can be calculated based on the assumption that the production of CO<sub>2</sub> by humans are the same, which is 0.3456 tons of CO<sub>2</sub>/human/year. Fitting the study that emphasises people who visit the park, the formula modification made to the name of the variable as shown below:

$$P = J_p \times C_{\text{visitor}}$$

Where,

P = Total CO<sub>2</sub> emissions from the population (tons/year)

J<sub>p</sub> = Total population (visitor)

C<sub>visitor</sub> = Total CO<sub>2</sub> produced by humans which is 0.3456 (ton/human/year)

While the CO<sub>2</sub> absorption capacity is based on Table 2 as indicated by (Prasetyo, Do, & Do 2002) and agreed by Idris et al. (2017) with three types of plants with CO<sub>2</sub> absorption ability, namely tree, bushy and meadow.

**Table 2:** CO<sub>2</sub> Absorption Ability According to the Type of Plant

No	Type of Plant	CO <sub>2</sub> Absorption Capacity (Kg/Ha/Day)	CO <sub>2</sub> Absorption Capacity (Ton/Ha/Year)
1	Tree	1559.1	569.07
2	Bushy	150.68	55.00
3	Meadow	32.88	12.00

Source: Idris et al., (2017) and Prasetyo, Do, & Do, (2002)

For this study, due to limited time and budget constraints, Esplanade Kuantan, Kuantan River Front Park & Taman Rekreasi were selected as the areas to collect the visitor data and used to calculate the carbon footprint analysis. The areas were selected as this area has been used as a recreational area and many residents of Kuantan were familiar with this area,

## ANALYSIS AND FINDING

Table 3 indicates the volumes of visitors to the Esplanade Kuantan measured daily for five weeks. The total number of visitors were approximately 5133 within the period of the study. Week 01 indicated the highest percentage at 22.05, followed by week 05 at 21.96 per cent, and for three other weeks, it is below 20.00 per cent. The weekly average of the visitor at 1,027 persons with an average of 147 visitors using the area daily.

**Table 3:** Average Visitor Daily (08.00-22.00)

Weekly	The visitor (J <sub>p</sub> )	%	CO <sub>2</sub> /Visitor	Total CO <sub>2</sub> (P)
Week 01	1132	22.05	0.3456	391.2192
Week 02	976	19.01	0.3456	337.3056
Week 03	905	17.63	0.3456	312.7680
Week 04	993	19.35	0.3456	343.1808
Week 05	1127	21.96	0.3456	389.4912
Total	5133	100		
Average Weekly	1027		0.3456	354.7930
Average Daily (P <sub>t</sub> )	147		0.3456	50.6847

Source: Authors, (2022)

Figure 1 shows the fourteen points of measurement to estimate the width of the study area in hectares. The estimated size for the Esplanade Kuantan

includes River Front Park and Taman Rekreasi. The total area estimate is 2.428 hectares.

**Figure 1: Profile Area (2.428ha)**  
Esplanade Kuantan (River Front Park & Taman Rekreasi)



Source: Author 2022

In terms of geospatial analysis, based on GIS data, the size of the coverage area was identified based on the type of trees planted in the area. Table 4 shows the measurement based on the geospatial map in figure 1 for Esplanade Kuantan. The Estimated covered area is 2.42 hectares, including trees, bushy and meadows. Most of the area covered with canopy trees at 76 percent with CO<sub>2</sub> absorption ability at 1050.09, small trees at 13 percent with CO<sub>2</sub> absorption ability at 17.3602, and 11 percent surrounded by grass or meadow with CO<sub>2</sub> absorption ability at 3.20496.

**Table 4: CO<sub>2</sub> Absorption Ability According to the Type of Plant**

No	Type of Plant	Area (%)	Area (Ha)	Ability Absorb Co2 (Ton/Ha/Year)	Amount
1	Tree	76	1.84528	569.07	1050.09
2	Bushy (small tree)	13	0.31564	55.00	17.3602
3	Meadow (grass area)	11	0.26708	12.00	3.20496
Total amount CO <sub>2</sub> absorption ability for the area (T <sub>i</sub> )					1070.65865

Source: Authors, (2022)

In terms of carbon footprint Analysis, Table 5 indicates the S value is at a lower level and therefore, the CO<sub>2</sub> absorption ability of trees in the study area is considered to be in good condition and considered to be sustainable based on literature review. According to the S values at -1019, the site still has a surplus in visitors at a maximum of 3000 daily.

**Table 5:** Carbon footprint analysis (S value)

Variable	Description	Total
P <sub>t</sub>	Total CO <sub>2</sub> emissions from the population (tons/year)	50.6847
T <sub>t</sub>	Total CO <sub>2</sub> absorption ability according to the type of plant (tons/year)	1070.6587
S <sub>value</sub>	P <sub>t</sub> - T <sub>t</sub>	-1019.9739

Source: Authors, (2022)

Therefore, the green area provided by the City Council of Kuantan, namely Esplanade Kuantan, is significantly sufficient for the needs of visitors and the surrounding environment.

## CONCLUDING REMARK

In general, CO<sub>2</sub> absorption ability needs to be introduced based on policies of the local authority in order to improve the air quality level in the city. For Kuantan City, the esplanade, RiverFront Park and Taman Rekreasi provide ample green spaces that can significantly control or reduce the CO<sub>2</sub> emission with higher absorption capacity. Based on the study, it is recommended that specific trees with prominent leaf characteristics, such as *Terminalia catappa* or 'ketapang' and *Samanea saman* or Trembesi that have the capacity to absorb high carbon dioxide should be planted in various part of city areas in order to improve the rate of carbon dioxide absorption created by various human activities.

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**ASSESSMENT OF PAYMENT RATES AND WILLINGNESS TO PAY  
AT TOURIST DESTINATION - A COMPARISON BETWEEN  
KUNDASANG AND KOTA BELUD, SABAH, MALAYSIA**

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**Abstract**

The state of Sabah is rich in unique and interesting natural resources, history, festivals and culture. This diversity of products and attractions has led to an increase in domestic and international tourist arrivals to the state. This article aims to examine the payment rates and tourist willingness to pay those who visit different tourist destinations in Kundasang-Ranau and Kota Belud, Sabah. The evaluation and case study research methods were used in this study. In this study, the evaluation and case study research methods were applied. A total of 150 people took part in this study, who visited a variety of tourist attractions in Kundasang-Ranau. There were 93 respondents in Kota Belud who took part in the study. The findings show that all the tourist destinations in Kundasang-Ranau charge visitors an entrance fee. Only five tourist attractions in Kota Belud require an entry fee. In Kota Belud, all designated tourist places charge a service fee, but in Kundasang-Ranau, only a few charges a service fee to tourists. The survey's findings also revealed that most respondents in both study locations considered the fee charged was appropriate in comparison to the services provided by the tourist attractions visited. In summary, the desire to pay among the respondents questioned was impacted by payment rates at tourist destinations in both locations.

**Keywords:** Payment rates, Assessment, Willingness to Pay, Tourist Destination

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## **INTRODUCTION**

On a global scale, tourism has experienced consistent expansion in recent decades (Arionesei et al., 2014) and now plays a significant part in the development of the rising international economy (Khan et al., 2020; Khan et al., 2020). According to Nabila and Jabil (2021), tourism is recognized as an industry capable of generating income through foreign exchange flows in most countries of the world as well as being the fourth largest industry in the global economy (Honey & Gilpin, 2009). The world's total number of international visitor arrivals is expected to reach 1.5 billion in 2019. This represents a 4% increase over the previous year's statistics. Tourism is seen as a leading and resilient economic industry, particularly in the face of current challenges (UNWTO, 2019; UNWTO, 2018).

In developing countries, the tourism sector is also seen to be very helpful in promoting economic growth by providing employment opportunities, generating income, diversifying the economy, protecting the environment and promoting cross-cultural exchanges (Honey & Raymond, 2009). Developing countries, such as Malaysia, are not lagging behind in terms of developing their own tourism industries, particularly in the ecotourism sector. After the industrial and commodities sectors, tourism is the third largest contribution to Malaysia's GDP. (Bernama, 2016; Department of Statistics Malaysia, 2020; MIDA, 2022). In 2019, the sector contributed about 15.9 percent to total GDP. In the recent years before the COVID-19 outbreak, the tourism industry in Southeast Asia has experienced a significant growth phase, and Malaysia launched the Visit Malaysia Truly Asia 2020 campaign targeting 30 million visitors and RM100 billion tourists (MIDA, 2022).

Tourism is defined as a transient visit activity that lasts at least 24 hours in the destination (Vanhove, 2005). Tourism is a network of temporary activities in which individuals or groups travel to a resort site from their place of origin (Badrudin, 2001; Muljadi, 2009; Yu et al., 2017; Camelari, 2017). Willingness to pay, often known as willingness to pay (WTP), is an important feature of tourism services. This is because tourism is an activity that requires payment when using a service. Willingness to pay is widely used to assess the worth of non-market items, such as nature-based activities like tourism (Baig et al., 2019; Neill, 2022).

Willingness to pay is the value or amount of payment a person is willing to pay for a quantity of a product or service (Krishna, 1991; Zhao & Kling, 2007; Namkung & Jang, 2017; Schidmit & Bijmot, 2020). In general, willingness to pay is defined as the highest price or value of payment that a person is willing to make in order to obtain a good or service. In the tourism industry, willingness to pay refers to a person's desire to pay for environmental conditions or an evaluation of nature's resources and services. This is done in order to improve the quality of the environment so that it can satisfy the appropriate criteria (Sofyan & Herlina, 2015). Hun and Anuar (2014) define willingness to pay as the most



money that tourists are willing to spend on recreational amenities. A person's willingness to pay more can be judged by whether they are willing to spend more money in order to acquire better goods and services. When visitors and tourists visit a tourist attraction, they are charged a fee.

When there is a willingness to pay linked with tourism, there is a cost to be paid when participating in the activity. Entrance fees to tourist locations other than activity fees and service costs are among the prices imposed to tourists in general (Jabil et al., 2020). In general, an entrance fee is a price levied on tourists who visit a paid tourist attraction. Entrance fees at tourist locations typically vary based on particular factors, such as age and citizenship status. Tourists are charged service and activity fees when they use the services or engage in the activities offered at tourist locations. The value of service fees and activity fees varies as well, depending on the sort of activities and services supplied (Nabila & Jabil, 2022).

Tourist willingness to pay can be determined by whether they are willing to pay when visiting a tourist site. Fees imposed at tourist destinations are typically used to improve the services and facilities provided at these locations for the benefit of tourist comfort. The fee charged is also a significant source of revenue for tourist locations that are visited by tourists (Sorefoglu, 2018). Tourist visits also generate revenues for tourist locations, such as admission fees, rental fees, sales revenue, licences, permits, and special service fees (Lindberg, 2001; Adetola et al., 2016). Several studies show that entry fee rates are required to cover operating expenses and costs in tourist destinations based on the price of entry fee payments in many developing countries (Laarman & Gregersen, 1996; Krug et al., 2002; Mmopelwa et al., 2007). The purpose of this study is to review and investigate the rates charged by tour operators, the various sorts of fees, the appropriateness of the rates charged, and respondents' recommendations for rates that should be charged in two different tourist sites.

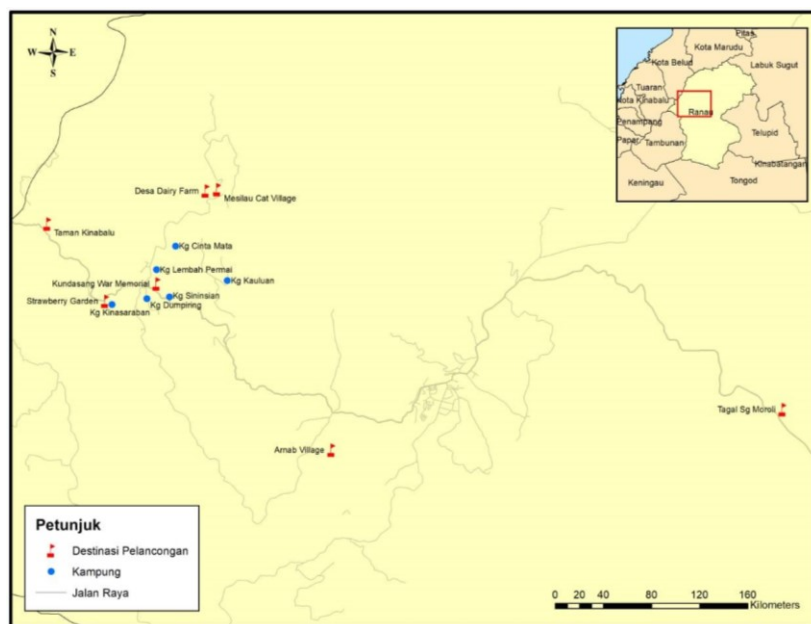
## **MATERIALS AND METHODS**

### **Study Area**

#### **(i) Kundasang-Ranau**

Kundasang, Sabah is a settlement in the Ranau district located in the Crocker Range which has an altitude of about 4,000 feet to 6,000 feet above sea level. The environment of Kundasang is surrounded by evergreen forests that are dense with nature. Within four kilometres of the town of Kundasang is the Kinabalu Park which has one of the oldest tropical forest reserves in the world and is rich in biodiversity. In this forest reserve area is located Mount Kinabalu, the highest mountain in Southeast Asia which is the pride of the state of Sabah (Ramzah & Amriah, 2008). The distance from Kundasang to Ranau town is 15 kilometres.

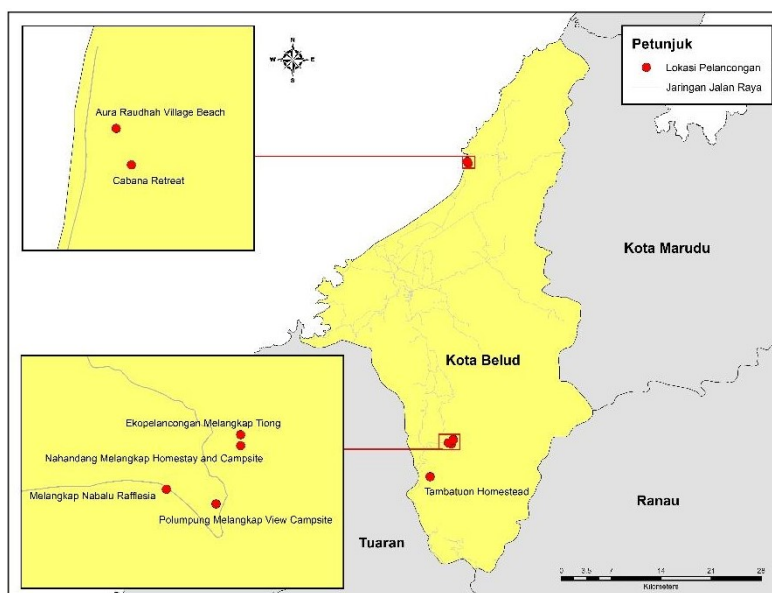
This area has several main villages, namely Lembah Permai, Cinta Mata, Kaulan, Sinisian, Dumpiring and Kinasaraban. The distance from Kota Kinabalu city centre to Kundasang is estimated at around 92 kilometres. The five tourist destinations studied in Kundasang are Kinabalu National Park, Strawberry Garden, Kundasang War Memorial, Desa Dairy Farm and Mesilou Cat Village while the two study locations in Ranau are Arnab Village and Tagal Sg. Moroli, Kampung Luanti, Ranau.



**Figure 1:** Study Area in Kundasang, Sabah  
Source: Modified from Google Earth (2021).

## **(ii) Kota Belud**

Kota Belud is a district located in the West Coast, Sabah. The distance from this district to Kota Kinabalu is about 70 kilometres or equivalent to an hour and a half journey by car. The district has several villages such as Kampung Rampayan, Kampung Siasai, Kampung Sembirai, Kampung Pirasan, Kampung Kulumbai and Kampung Kelawat (Jabil et al., 2021). There are many tourist destinations in Kota Belud. However, only seven tourism destinations were selected in this study, namely Polumpung Melangkap View Campsite (PMVC), Cabana Retreat, Melangkap Nabalua Rafflesia, Tambatuon Homestead, Ekopelancongan Melangkap Tiong, Aura Raudhah Village Beach and Nahandang Melangkap Homestay and Campsite.



**Figure 2:** Study Area in Kota Belud, Sabah  
 Source: Modified from Google Earth (2021).

## Methods

The researcher intends to assess and investigate the fee rates charged by tour operators, the variety of fee categories, the appropriateness of the fee rates charged, and the respondents' recommendations for the fee rates that should be charged in this study. As a basis, the research design employed by the researcher was a survey and a case study. According to Childers (1989), survey methods are routinely employed for decision-making in fundamental research. Furthermore, this strategy is employed to solve difficulties that are related to an issue. An assessment design is the most common study design used in social science research to examine a phenomena or issue that happens in a single area. The collection of data linked to an organisation, process, programme, service, or resource is a thorough and methodical procedure that involves evaluation (Powell, 2006; Alexander et al., 2020). The case study design is used to investigate phenomena, formulate hypotheses, and validate research methodologies (Teegavarapu et al., 2008; Yin, 2004).

The number of responders participated in Kundasang - Ranau is 150, while in Kota Belud it is 93. Visitors to specified tourist locations in both research areas were the intended respondents in this study. The sample method employed

is simple random sampling, which means that all visitors have an equal chance of being responders in this survey.

Following that, the data from respondents' demographic profiles and visit characteristics were analysed using the Statistical Package for The Social Science (SPSS) software. The analysed data is then provided in tabular form, accounting for overall frequency and percentage. To assist researchers in examining the categories and criteria of fees charged by tour operators, the data for the categories and criteria of fees charged at tourist destinations were evaluated using content analysis. Following that, theme analysis was used to assess the appropriateness of the rates charged to visitors and visitors' recommendations for the rates paid at tourist locations. Theme analysis might be described as the study's final product (Braun & Clarke, 2006; Vaismoradi & Snelgrove, 2019). The end outcome of theme analysis is decided by the researcher's purpose to attain the desired level of descriptive and interpretive (Vaismoradi et al., 2013, 2016; Bengtsson, 2016; Vaismoradi & Snelgrove, 2019). In this case, visitors to the two study locations will be asked open-ended questions and their answers will be dialyzed and classified using similar and appropriate themes.

## RESULT AND DISCUSSION

### Respondents Demographic Profile

The demographic profile of respondents who visited Kundasang-Ranau and Kota Belud in Sabah is shown in Table 1. The majority of respondents who visited selected tourist locations in Kundasang-Ranau were domestic tourists, while the majority of respondents who visited Kota Belud were locals. In terms of marital status and age, the majority of visitors to the study area were single and between the ages of 21 and 30. For visitors to the study region, there was a considerable disparity in employment and total monthly income. This is due to the fact that the bulk of visitors to selected tourist spots in Kota Belud are students. The majority of visitors to the research area were in their upper secondary, pre-university, or higher education levels.

**Table 1:** Respondents Demographic Profile

Demographic Characteristic	Criteria	Kundasang - Ranau		Kota Belud	
		N	(%)	N	(%)
Respondent Categories	Locals	50	33.0	52	55.9
	Domestic Tourist	96	64.0	41	44.1
	International Tourist	4	3.0	-	-
Sex	Man	87	58.0	34	36.5
	Woman	63	42.0	59	63.4

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Marital Status	Single	92	61.3	85	91.4
	Married	58	38.7	8	8.6
Age	20 years and below	5	3.33	2	2.2
	21 - 30 years old	69	46.0	82	88.2
	31 - 40 years old	38	25.3	3	3.3
	41 - 50 years old	20	13.3	4	4.3
	51 years old and above	18	12.0	2	2.2
Level of Education	Informal Education	-	-	-	-
	Low Education	1	0.7	-	-
	Secondary Education	80	53.3	13	14.0
	Pre-University / Diploma	32	21.3	33	35.5
	Higher Education	37	24.7	47	50.5
Occupation	Public sector	36	24.0	5	5.5
	Private sector	25	16.7	8	8.9
	Self-employed	39	26.0	3	3.3
	Traders/entrepreneurs	9	6.0	1	1.1
	Retired	7	4.6	-	-
	Students	19	12.7	73	78.5
	Housewife	15	10.0	3	3.3
Total Income Monthly	RM2,500 and below	75	50.0	12	12.9
	RM2,501 - RM5,000	41	27.3	7	7.5
	RM5,001 - RM7,500	7	4.7	1	1.1
	RM7,501 - RM10,000	4	2.7	-	-
	RM10,001 and above	4	2.7	-	-
	<i>Not relevant - student respondents</i>	19	12.7	73	78.5

N=Frequency

### Respondents Visit Characteristics

The characteristics of visitor visits to the two tourism attractions are shown in Table 2. According to the study's findings, the majority of respondents to the chosen resort destinations were on vacation and managed privately. The majority of respondents' visits were with family and friends in private or rented vehicles. There is a substantial disparity in the length of time visitors remain in the research area, with the majority of respondents visiting Kundasang-Ranau overnight and staying in homestays, whereas the majority of respondents visiting Kota Belud do not stay overnight and visit just on a day trip. This is related to the demographics of respondents who visited the two research areas. The majority of visitors to Kundasang-Ranau are domestic tourists on vacation from districts other than Kundasang-Ranau, Sabah.

**Table 2:** Respondents Visit Characteristic

Characteristics	Criteria	Kundasang - Ranau		Kota Belud	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Visit type	With family	80	53.3	10	10.8
	With partner	19	12.7	3	3.2
	With friends (Institution etc.)	51	34.0	80	86.0
Main purpose to visit tourism destination	Holiday	142	94.0	44	47.3
	Study	4	3.0	42	45.2
	tours/education purpose				
	Attending workshops/courses/identity camps	4	3.0	1	1.1
	Others	-	-	6	6.5
Way to manage visit	Managed privately	131	87.33	58	62.4
	Managed by a travel agency	11	7.33	3	3.2
	Managed by the institution/department/company	8	5.33	32	34.4
Information about tourism destination	Social media	101	67.33	40	43.0
	Family	23	15.33	5	5.4
	Friends/ acquaintances	23	15.33	42	45.2
	Travel brochures/magazines	3	2.0	4	4.3
	Others	-	-	2	2.2
Transportation	Private vehicle	63	42.0	39	41.9
	Rental vehicle	68	45.3	25	26.9
	Travel package vehicle	11	7.3	4	4.0
	Others	-	-	25	26.9
Accommodations	Homestay	76	50.6	40	43.0
	Hotel/motel	39	26.0	2	2.2
	Relative homes/acquaintances	4	2.7	6	6.5
		31	20.7	45	48.4
	Did not stay				

### **Fee Rates and Willingness to Pay at Tourist Destinations Selected in Kundasang-Ranau and Kota Belud**

The explanation of the concept of fee rate and willingness to pay in this tourist destination is examined from four aspects, namely (i) the criteria for the type of fee charged; (ii) the value of the fees charged at selected tourist destinations; (iii) an opinion on the entry fee rate to be charged and (iv) a proposal for the entry fee rate to be charged.

#### **Criteria for Types of Fees Charged to Visitors**

The findings revealed that 100 percent of respondents who visited chosen tourist locations in Kundasang-Ranau were paid an admission price, but only 57.0 percent of those who visited Kota Belud were charged an entrance fee. This is due to the fact that there are tourist spots in Kota Belud that do not charge guests any admission fees. The entrance fee payment is frequently charged to visitors of a tourist location and varies depending on the time period or type of access (Spergel & Moye, 2004; Adetola et al., 2016). (Lindberg, 2001). According to Reynisdottir et al. (2008) and More (1999), as the number of tourists increases, so will the cost of spending in tourist destinations, as many locations will receive more visitors. As a result, visitors who come to support the cost of their costs at each tourist location are charged an admission fee. According to the findings of the study, the number of respondents who spend a lot for activity fees is highest in Kota Belud, Sabah. This is due to the fact that certain tourist attractions in Kota Belud offer more activities for visitors.

**Table 3:** Types of Fees Charged by Tourist Destination Operators

Type of payment	Kundasang - Ranau		Kota Belud	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Entrance fee	150	100.0	53	57.0
Service fee	17	11.3	16	17.2
Activity Fee	6	4.0	56	60.2

#### **Rates Charged to Visitors at Tourist Destinations**

The findings of the study in the two study locations differ in terms of the fee rates paid to visitors. All tourist places investigated in Kundasang-Ranau charge visitors an entrance fee. In Kota Belud, there are tourist attractions that do not require admission fees, such as Tambatuon Homestead and Aura Raudhah Village and Beach. The entrance charge rates for the two research locations varied based on a number of parameters established by the tourism establishments operators. For example, the entrance cost charged to domestic tourists differs from the fee charged to international travellers. The rate of payment of activity

fees and service fees varies depending on the tourist sites visited by the respondents. Furthermore, there are tourist locations in both study areas that do not charge respondents any service or activity fees. This is due to the tourist destination's lack of services or activities to offer guests. The Kundasang War Memorial, for example, does not collect any activity or service fees. This is due to the fact that this tourist spot is a historical relic, and tourists can snap photographs as keepsakes. The majority of the tourist spots visited by respondents in Kota Belud offer lodging to guests. This is due to the fact that the selected tourist locations in Kota Belud provide a variety of camping-related services and activities in the tourist destinations researched. As one of the most important sub-sectors of tourism, accommodation services constitute the backbone of the tourism business. This is due to the fact that travellers require a place to relax while travelling (Paundel, 2013). When there is no hotel service at a tourist location, travel is deemed incomplete (Cooper et al., 2008; Paundel, 2013). Domestic and international tourism rely heavily on accommodation services. As a result, camping-style accommodation is recognised as an essential form of accommodation in many vacation destinations. Such housing services are quite popular in a number of European and American countries (Cooper et al., 2008; Saxena, 2008; Paudel, 2013; Cvelic-Bonifacic et al., 2017).

**Table 4:** Rates and Criteria for Payment of Fees in Kundasang - Ranau

Location	Payment Category	Price
Kinabalu National Park	<b>1. Entrance fee</b>	
	Citizens 18 years and above	RM3
	Citizens 17 years and below	RM1
	Non-citizens 18 years and above	RM15
	Non-citizens 17 years and under	RM10
	<b>2. Activity fee</b>	
Climbing Mount Kinabalu	RM350	
Kinabalu National Park	<b>3. Service Fee</b>	
	Lemaing Hotel Kinabalu	RM300
	Panalaban Hotel Kinabalu	RM407
	Grocery / souvenir shop	-
	Restaurant	-
Strawberry Garden	<b>1. Entrance fee</b>	RM3
	<b>2. Activity Fee</b>	
	Picking strawberries	RM60/KG
	<b>3. Service fee</b>	-



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Kundasang War Memorial	<b>1. Entrance fee</b> Adult citizens Non-adult citizens Students and children	RM3 RM10 RM2
	<b>2. Activity fee</b>	-
	<b>3. Service fee</b>	-
Dairy Farm Village	<b>1. Entrance fee</b> Adults Children	RM5 RM4
	<b>2. Activity fee</b> Feeding goats Feeding cows	RM3 RM3
	<b>3. Service fee</b> Fresh milk Yogurt Ice cream	RM5 RM3 RM3
Mesilou Cat Village	<b>1. Entrance fee</b>	RM4
	<b>2. Activity fee</b> Feeding cats	RM3
	<b>3. Service fee</b>	-
Arnab Village	<b>1. Entrance fee</b>	RM10
	<b>2. Activity fee</b> Feeding rabbits Giving milk to the rabbits	RM3 RM2
	<b>3. Service fee</b> Taking picture Grocery store Restaurant	RM30 - -
Tagal Luanti, Sungai Moroli, Ranau	<b>1. Entrance fee</b>	RM5
	<b>2. Activity fee</b> Feeding fish Bathing with fish Foot soak - adults Foot soak - children	RM1 RM10 RM5 RM2
	<b>3. Service fee</b> Fee to bring a digital camera Snacks	RM3 RM1

**Table 5: Rates and Criteria for Payment of Fees in Kota Belud**

Location	Payment Category	Price
Polumpung Melangkap Campsite View	<b>1. Entrance fee</b>	RM3
	Overnight stay	RM6
	<b>2. Activity fee</b>	-
	<b>3. Service fee</b>	
	<ul style="list-style-type: none"> <li>● Tent</li> <li>2 pax</li> <li>4 pax</li> <li>6 pax</li> <li>8 pax</li> <li>● Sleeping bag</li> <li>● Pillow</li> <li>● Air mattress</li> <li>● Mat</li> <li>● Table</li> <li>● Chair</li> <li>● Portable gas</li> <li>● BBQ pit</li> <li>● Canopy</li> <li>● Fan</li> <li>● Facilities</li> <li>Kitchen hut</li> <li>Multipurpose hut</li> <li>Multipurpose hut (20x4)</li> <li>Traditional bamboo hut</li> </ul>	RM10 RM20 RM30 RM40 RM5 RM3 RM10 RM3 RM5 RM1 RM15 RM10 RM15 RM5 RM40 RM40 RM80 RM40
Cabana Retreat	<b>1. Entrance fee</b>	RM5
	<b>2. Activity fee</b>	
	<ul style="list-style-type: none"> <li>● Driving an ATV</li> <li>● Cycling</li> <li>● River Cruise &amp; Fireflies (Adult)</li> <li>● River Cruise &amp; Fireflies (Children)</li> </ul>	10 minutes/RM30 30 minutes/RM80 30 minutes/RM10 RM75 RM65

	<b>3. Service fee (accommodation)</b> <b>Quad tent</b> <ul style="list-style-type: none"> <li>● <b>Value deal</b> Weekdays Weekend</li> <li>● <b>Stay and dine in</b> Weekdays Weekend</li> </ul>	     	     	
	<b>Deluxe queen</b> <ul style="list-style-type: none"> <li>● <b>Value deal</b> Weekdays Weekend</li> <li>● <b>Stay and dine in</b> Weekdays Weekend</li> </ul>	     	     	     
	<b>Classic Tent</b> <ul style="list-style-type: none"> <li>● <b>Value deal</b> Weekdays Weekend</li> <li>● <b>Stay and dine in</b> Weekdays Weekend</li> </ul>	     	     	     
	<b>Deluxe Single</b> <ul style="list-style-type: none"> <li>● <b>Value deal</b> Weekdays Weekend</li> <li>● <b>Stay and dine in</b> Weekdays Weekend</li> </ul>	     	     	     
	<b>Romantic Tent</b> <ul style="list-style-type: none"> <li>● <b>Value deal</b> Weekdays Weekend</li> <li>● <b>Stay and dine in</b> Weekdays Weekend</li> </ul>	     	     	     

Complementing Nabalu Rafflesia	<b>1. Entrance fee</b> Citizen (Adult) Citizen (12-16 years old) Citizens (children) Non -citizen (Adult) Non-citizen (12-16 years old)	RM3 RM2 Free RM6 RM4
	<b>Overnight fee</b> Citizen (Adult) Citizen (12-16 years old) Non -citizen (Adult) Non-citizen (12-16 years old)	RM6 RM4 RM12 RM8
	<b>2. Activity fee</b> Hiking (Complete hill) (1-5 hikers + 1 guide)	RM65/pax
	<b>3. Service fee</b> <ul style="list-style-type: none"> <li>● Tent rental (4 pax &amp; 8 pax)</li> <li>● Canopy rental (chairs &amp; table)</li> <li>● Traditional Home</li> <li>● Hall</li> <li>● Board (gas tank etc.)</li> <li>● Homestay &amp; house</li> <li>● Karaoke set</li> <li>● Pillows, blankets &amp; mats</li> <li>● BBQ pit</li> <li>● Fire pit</li> <li>● Tube/buoy</li> </ul>	<ul style="list-style-type: none"> <li>✓ RM20 &amp; RM40</li> <li>✓ RM15/hour</li> <li>✓ RM45/night</li> <li>✓ RM30/2 hour</li> <li>✓ RM30-RM50</li> <li>✓ RM70-RM180</li> <li>✓ RM50/2 hour</li> <li>✓ RM3</li> <li>✓ RM10</li> <li>✓ RM20</li> <li>✓ RM3-RM5/3 hour</li> </ul>
Tambatuon Homestead	<b>1. Entrance fee</b>	Free
	<b>2. Activity fee</b>	-
	<b>3. Service fee</b> Standard family Standard queen Standard double decker	RM100 RM40 RM25/pax
Complementing Tiong Ecotourism	<b>1. Entrance fee</b>	RM3
	<b>2. Activity fee</b> Feeding fish	RM1

	<b>3. Service fee</b>	-
Aura Raudhah Village Beach	<b>1. Entrance fee</b>	-
	<b>2. Activity fee</b>	-
	<b>3. Service fee (accommodation)</b>	
	<ul style="list-style-type: none"> <li>● Pyramid Chalet</li> <li>● Blue Box Chalet</li> <li>● Pink Box Chalet</li> <li>● Blanket</li> <li>● Pillow</li> <li>● Towel</li> <li>● Single bed 1 set</li> <li>● Single mattress 1 set</li> </ul>	RM80 & RM100 RM160 RM180 RM5 RM5 RM5 RM30 RM20
Nahandang Complements Homestay and Campsite	<b>1. Entrance fee</b>	RM3
	<b>2. Activity fee</b>	-
	<b>3. Service fee (accommodation)</b>	
	Campsite + camp Twin queen bed Twin single Queen bed	RM6 & RM10 RM180/night RM80/night RM75/night

### Appropriateness of Fees Charged to Visitors

According to the study's findings in Tables 6 and 7, the majority of respondents who visited the study region were satisfied with the fees imposed by tour operators. Incoming tourists are more inclined to pay if the fees are meant to improve tourist facilities and services (Peters, 1998; Tisdell & Wilson, 2003; Tao et al., 2012; Bruner et al., 2015).

**Table 6:** Appropriateness of Fee Rates Charged to Visitors in Kundasang-Ranau

<b>Statement</b>	<b>Percentage (%)</b>
The rates charged are reasonable with what the tourist premises have offered	74.1
The fees charged are expensive and not affordable with what the tourist premises have to offer	17.2
The fees charged are cheap and well worth what the tourist premises have to offer	8.7

**Table 7:** Appropriateness of Fee Rates Charged to Visitors in Kota Belud

Statement	Percentage (%)
Rates are reasonable with the services provided	57.0
Fee rates are reasonable with the activities provided	26.9
The fees charged are expensive	13.0
<i>Not answering</i>	3.1

### Suggestions for Rates to Be Charged to Visitors

The results showed that the majority of respondents who visited Kundasang-Ranau and Kota Belud advised that the current payment rate be maintained by the tourism establishments involved. Respondents in Kundasang-Ranau advise that the admission price rate be reduced, the fee charged to international tourists be increased, and the entrance fee rate for children and adults be distinguished for tourist places that do not separate the entrance fee rate according to criteria. Furthermore, several respondents proposed that tour operators add items and attractions to the tourist areas involved.

In Kota Belud, the proposal given by the respondents is to increase the existing fee payment rate for the purpose of upgrading the existing facilities and reduce the fee payment rate, especially for students. Next, there are respondents who suggested that fees should be charged at tourist premises that do not charge entrance fees.

According to Buckley (2006), the rate of fees imposed on tourists can influence their behaviour, such as their choice of alternative activities or tourist locations. This is consistent with his research on the impact of entrance fee payments on visitor behaviour. In this instance, low-income travellers are more likely to choose low-cost activities or tourist sites. However, according to Burns and Grarfae (2006), fee payments at a reasonable level have no effect on the behaviour of low-income tourists. As a result, some researchers argue that fee payments and the consequences they will have should be addressed in relation to other aspects such as visitor characteristics, service quality, and how fees are paid (Buckley, 2006; Garrod & Fyall, 2000).

**Table 8:** Suggestions for Rates to Be Charged to Visitors in Kundasang - Ranau

Statement	Percentage (%)
Maintain the existing fee rate	37.9
Distinguish the entrance fee for adults and children	17.2
Raise entrance fees for foreign tourists	12.9
Need to add products and attractions in tourist destinations	11.6
Reduce the entrance fee charged	10.4

**Table 9:** Suggestions for Rates to Be Charged to Visitors in Kota Belud

Statement	Percentage (%)
Maintain existing payment rates	46.2
Charging entrance fees at tourist destinations that do not charge entrance fees	15.1
Reduce payment rates especially for students	11.8
Raise the fee payment rate	9.7
Not answering	17.2

## CONCLUSION

A willingness to pay (WTP) survey should be conducted to determine visitor input and satisfaction with fee rates imposed at tourist locations. According to the study's findings, the majority of visitors to Kundasang - Ranau and Kota Belud claimed that the payment rate is reasonable and appropriate for the level of services given at tourist locations. In this approach, tourist fees can assist tour operators in improving existing tourism facilities and services. This could lead to an increase in the number of people visiting a single tourist destination in the future. However, the respondents' ideas for the appropriate payout rate were found to be varied. As a result, stakeholders, particularly tourism development planners and policymakers, must develop and implement an integrated and systematic strategy to ensure that tourist destinations in the state can offer competitive and sustainable rates, improve service quality, and diversify the products offered.

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## **BACKPACKER TOURISM CIRCUIT IN KOTA KINABALU, SABAH**

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### **Abstract**

Kota Kinabalu is a well-known tourist destination in the Malaysian state of Sabah. This city serves as the beginning point for the majority of the Sabah state's tourism circuits. This research is focused on the backpacker tourist circuit of Kota Kinabalu. Furthermore, this study involves an analysis of backpacker tourist locations that may be promoted into visiting the various destinations in Sabah via tourist circuits. The study design employed is a survey approach with quantitative approaches as research tools. In this study, a total of 228 backpackers in Kota Kinabalu responded to the questionnaire. The study only involved backpackers originating from countries in continental Europe, North and South America and Oceania. ArcMap 10.8 was used to map the circuit that was discovered during the data processing. The study's findings revealed that the backpackers' tourist circuit in Kota Kinabalu is limited and significantly impacted by prominent attractions visited by mass tourists. This research also shows that there are several acceptable tourist locations in Kota Kinabalu's backpacker tourist circuit that may be grouped according to certain themes like cuisine tourism, educational tourism, ecotourism, mountaineering or hill climbing tourism. Overall, Kota Kinabalu's tourist sector offers tremendous growth potential for backpacker tourism, which may become the mainstay of the industry. As a result, the government and other stakeholders must do more to boost backpacker tourism in Kota Kinabalu.

**Keywords:** Backpacker tourism, tourist circuit, alternative tourism, travel, GIS

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## **INTRODUCTION**

Backpacker tourism developed in the early 1980s, perhaps as a result of previous overland “hippy” travel (Cohen, 1973; Hampton, 2013; Thieme et al., 2021). According to Cohen (2018), backpackers spend their money in far more geographical areas than typical mass tourism, resulting in less tourism growth. Backpacking is a type of low-cost, independent travel that involves the use of a backpack that can be easily carried over long distances or for extended periods of time, public transportation, inexpensive accommodation such as youth hostels, often a longer trip duration than traditional vacations, and an interest in meeting locals as well as local sightseeing (Pearce, 1990; Loker-Murphy & Pearce, 1995; Jayasinghe & Boyagoda, 2020). As a result, in order to establish a backpacker tourism destination, a specialized tourist circuit that fits the essential criteria of a backpacker must be considered.

Deka (2018) emphasizes that tourist circuit design is concerned with the planner's or host agency's strategic planning and development of tourism skills. The preparation of a circuit is a comprehensive approach for molding a commerce or tourist destination into an industrial setup that includes all of the procedures necessary to fulfill the tourism business's goal (Deka, 2018). As a result, people, stakeholders, and tourists must all work together to safeguard nature and maintain the region's culture and legacy. Aside from their relevance in the tourism industry, strong human and environmental interactions are also critical for the sustainability of the locals who live in the region (Khalilah et al., 2017). According to the Department of Tourism India (2003), the development of the tourist circuit requires the development of proper support systems at various locations along the tourist route and at the same time provides opportunities for locals to be involved in the tourism development process. Local tourist destination managers must be aware of the essential variables that might improve a destination's competitive advantage, as well as the relationships between them (Nguthi et al., 2021).

Access and evaluation of the destination, master plan, land use and planning, ecological architecture, advertising tactics, marketing tourism skills, conservation, and viewing the attractions that assist to glorify tourism in any location are all part of the overall planning process (Deka, 2018). According to him, when these qualities are met, tourism development may be a valuable instrument for stimulating the economy, alleviating poverty, conserving nature, maintaining culture and ethnicity, and generating job opportunities for locals.

Malaysia, on the other hand, is a major part of Southeast Asia's backpacker tourist network. It is an important transit point for tourists because of its location between Thailand, Singapore, Indonesia, and the Philippines. The state of Sabah, which benefits from Mount Kinabalu and Sipadan Island, is a major draw for tourists to this well-known natural wonder (Johan & Jabil, 2020). Furthermore, being the state's entrance point for tourism, Kota Kinabalu plays an

important role in providing facilities to visitors visiting Sabah. Therefore, research on the development of the tourist circuit in Kota Kinabalu needs to be done.

## LITERATURE REVIEW

### *Who are backpackers?*

Backpackers are defined by a number of criteria. Socio-demographics, travel motivation, travel characteristics, virtual communities, tourist circuit based on interests, self-identification, and economic factors were used to measure the criteria. Backpackers, according to Loker and Laurie (1993), are those between the ages of 18 and 30 or between the ages of 15 and 25 (Hunter et al., 2008) who travel to new places. Backpackers are people who travel in their leisure time (Adam, 2015). According to Zhang et al. (2018), backpackers are persons who travel alone while carrying a backpack. Backpackers typically travel for many months, a year, or more (O'Reilly, 2006; Elsrud, 2001). Members of backpacking groups on social media sites such as Facebook, however, can also be classified as backpackers (Paris, 2012). Because the definition of backpacking criterion is so broad, Table 1 was created specifically to make the concept of backpackers' criteria easier to grasp.

**Table 1:** Criteria for defining travel tourism from various scholars internationally

Criteria	Scholar
<b><i>Socio-demographic (age)</i></b>	
i. 18 - 30 years old	Loker & Laurie (1993)
ii. 15 – 25 years old	Hunter-Jones <i>et al.</i> (2008)
<b><i>Motivation to travel</i></b>	
i. Travel based on leisure time	Adam (2015)
<b><i>Travel characteristics</i></b>	
i. Preference for budget accommodation and young people's hostels	Pearce (1990), Dayour <i>et al.</i> (2016), Zhang <i>et al.</i> (2018)
ii. Carry a backpack and travel independently	Zhang <i>et al.</i> (2018)
iii. Longer than a regular vacation	Pearce (1990)
iv. Traveling for several months up to a year or more	O'Reilly (2006), Elsrud (2001)
v. Flexible itinerary	Pearce (1990)
vi. Emphasis on meeting with other tourists and the local community	Pearce (1990)
<b><i>Virtual community</i></b>	
i. Member to the backpackers group on Facebook	Paris (2012)
ii. Users of the backpackers website	O'Reilly (2006)

<b><i>Interest-based backpackers enclaves</i></b>		
i.	Interest-based backpackers (backpackers enclaves)	Sorensen (2003)
<b><i>Self-identification</i></b>		
i.	i. Recognize themselves as backpackers or by invitation to join a trip in backpacker tourism	Uriely <i>et al.</i> (2002), Reichel <i>et al.</i> (2007), Cohen (2011)
<b><i>Economical factor</i></b>		
i.	Budget travelers	O'Reilly (2006)
ii.	Choose to use public transportation while traveling in the destination visited	Pearce (1990)

*Source: Modified from Dayour et al. (2017).*

In summary, according to Pearce (1990), there are four main aspects that distinguish backpackers from other tourists: (i) from the definition, a backpacker is a traveller who prioritises budget accommodation, meeting other tourists, longer trips, priority to relationships with local residents, and has a more flexible travel schedule, (ii) the primary purpose of travel is to explore the locations visited; (iii) the sorts of activities undertaken by backpackers are more diverse and limitless; and (iv) backpackers organise their journeys on their own with little or no institutional participation.

***What is the tourist circuit?***

Dam (2016) emphasised that the tourist circuit needs rigorous and comprehensive planning. Tourist circuits are frequently referred to by a variety of words and ideas, including tourist routes, tourist corridors, tourist clusters, and so on (Hannam & Diekmann, 2010; Dam, 2016). A tourist circuit can be built within a country (intra-border) or between two or more countries (cross-border) (Sisodia, 2011). Chowdhary (2014) stated that a sightseeing route includes vacations to more than one place throughout the journey away from home. According to Alivand et al. (2015), these circuits should have a variety of environmental elements that will encourage tourists to use them. The uniqueness and authenticity of the prospective tourism products available in an area influence the tourist circuit's diversity. Religious, historical, tribal culture, traditional and heritage, art and craft, nature-based tourism circuits, and so on are some examples of tourist circuits (Khalilah et al., 2017; Deka, 2018).

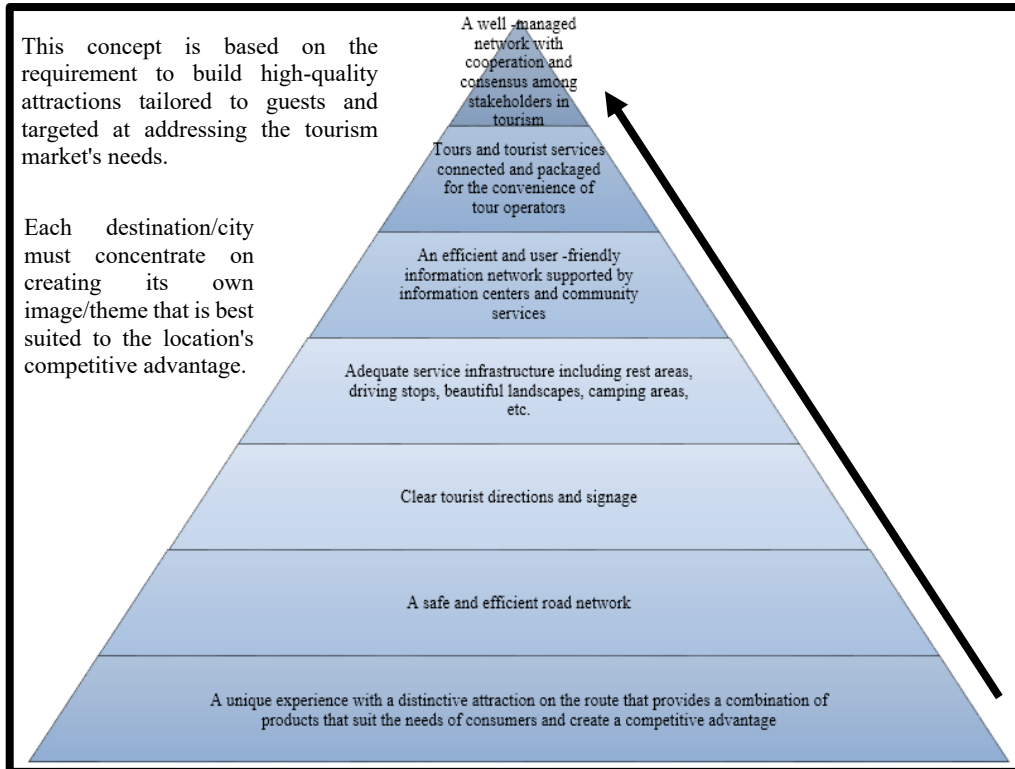
A tourist circuit is a group of tourist attractions designed to draw in more people and allow them to spend more time at the destination (Prasad & Sundari, 2012). Khalilah et al. (2017) explains that interesting routes between two locations play an important role for visitors to choose their tourist circuit. The element of relative distance through time measurement is essential, according to Hasuike et al. (2013), since it influences the duration of trip and the pleasure value for each activity done by visitors throughout their trip. The quickest route is

frequently selected since it allows travellers to get at their destination in less time, giving them more time to enjoy their holiday (Hashim et al., 2013). However, if the travel motivation is stimulated along the way before arriving at their target destination, a lengthier or remote route might be chosen till the route fits the tourists' demands (Johan & Jabil, 2020).

Many tourist destinations throughout the world have the potential to become profitable tourist circuits. Nguthi et al. (2021), for example, state that there are numerous opportunities for the development of various forms of tourism in his study area. However, the natural and cultural capital have not been optimally exploited for development, and the entire circuit is still lagging behind in various types of tourism. Research on the development of this tourist circuit is also widely discussed by scholars around the world (Ward-Perkins et al., 2019; Vakharia & Bhagat, 2020; Johan & Jabil, 2020; Nguthi et al., 2021). A proactive measure is required to guarantee that the development of the backpacker tourism circuit, particularly in the researcher's subject region, is thoroughly investigated. The selection of destination routes based on the target market, the importance of the destination, audit of tourism products, study of tourism assets, and unique sales features discovered in a destination are all phases in tourist circuit creation (Lourens, 2007). Furthermore, the growth of the tourist circuit necessitates product development, the creation of a defined strategy, and, lastly, the branding of the tourism destination. Therefore, the researcher utilised Hardy's Successful Tourism Route Model (2003) to discuss on how to develop a tourism circuit in the study region in further detail.

#### ***Hardy's Successful Tourism Route Model (2003)***

Hardy (2003) points out that one of the ways to manage tourist flows is through themed tourist routes, corridors or own tourist routes. The importance of themed tourist routes involves the connections made between points of interest and various interests and motivations. Therefore, management should strive to coordinate these factors. One of the advantages of the development of tourist routes is that tourists can choose to enter and exit the route. Thus, stakeholders in tourism are able to balance demand along the route itself and the surrounding area (Hardy, 2003). The National Center for Tourism (NCT), Australia has conducted a study on the development of successful tourism routes as shown in Figure 1.



**Figure 1:** Successful Tourism Circuit Model

*Source: Adapted from Hardy (2003).*

Based on Figure 1, there are seven stages in a successful tourism route model. This model emphasises that the first and most fundamental thing in the formation of a successful tourism route is a unique experience with a distinctive attraction to the route that provides a combination of products that suit the needs of users and create a competitive advantage. Among the tourism products include beautiful landscapes, heritage features, sea views, mountains or inland views. Next, when a tourist route has its own attractions and has diversity, the second stage is the development of a safe and efficient road network. This includes providing a secure transportation network system for tourists to come to a place they want to visit.

Third, clear tourist directions and signage. A successful tourist route should have clear tourist directions and signage. This is important to prevent tourists from getting lost while travelling in private. The signboard provided must have complete information such as the distance, name of the destination and the distance of the destination from where the signboard is placed. Fourth, adequate service infrastructure. This is because tourist routes that provide a complete



service infrastructure tend to be visited by many tourists. The infrastructure includes rest areas, driving stops, beautiful landscapes, camping areas and so on. Fifth, an efficient and user-friendly information network supported by information centres and community services. Information on tourist routes such as tourist maps and tourist activities offered should have information channels that are easily understood by tourists. The availability of tourist destinations in integrating information centres and community services to provide the best information network, thereby increasing the potential of a tourist route to be successful. Sixth, tours and tourist services that are connected and packaged for the convenience of tour operators also influence the success of a tourist route. Finally, a successful tourism route must have a well-managed network with cooperation and agreement between tourism stakeholders. The government and other stakeholders in tourism should work together in developing successful tourism routes.

## RESEARCH METHODOLOGY

This study involves the study of phenomena related to the pattern of backpacker tourism in Kota Kinabalu, Sabah. The study design employed is a survey approach with quantitative approaches as research tools, which examines the tourist circuit of the backpackers in Kota Kinabalu. Purposeful sampling technique is used in this study. Specifically, this study was conducted around budget accommodation and tourist hotspots located around Kota Kinabalu, Sabah (Figure 2).

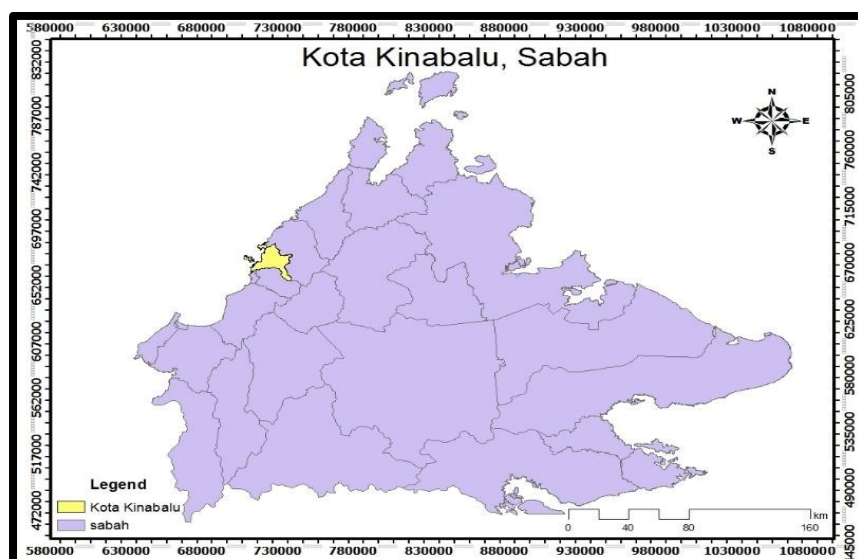
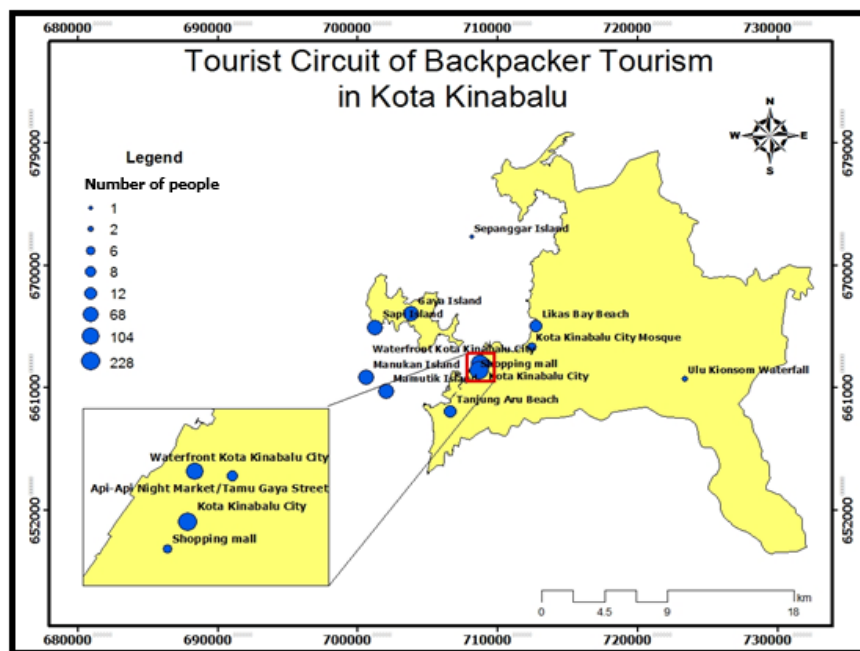


Figure 2: Map of the study area  
Source: Researcher (2020).

The number of international tourist arrivals to Sabah obtained from Sabah Tourism Board sources in 2018 was 1,361,567 people. Of that number, 113,043 were foreign tourists from Europe, North and South America and Oceania. Therefore, the selected sample size is a total of 383 people from countries on the continent. The determination of this total sample size was based on the formula proposed by Krejcie and Morgan (1970). However, the implementation of the Movement Control Order (MCO) which began on 18 March 2020 in Malaysia has resulted in restrictions on the entry of international tourists which in turn limits the number of respondents that can be obtained in this study. For that, the sample size was set to 228 backpackers. ArcMap 10.8 was used to map the circuit identified after data processing as well as to map the recommendation of various tourism circuits that may be offered in Kota Kinabalu.

### FINDING & DISCUSSIONS

The respondents' tourist circuit in Kota Kinabalu is relatively limited. The respondents' declared destinations only included nine places, yet there were visitors who stayed in cheap accommodations till they continued their journey to other destinations. Figure 3 shows the backpacker tourist circuit in Kota Kinabalu.



**Figure 3:** Tourist circuit of Backpacker Tourism in Kota Kinabalu  
*Source: Field study (2020).*

According to Figure 3, 104 respondents visited the Kota Kinabalu Waterfront to appreciate the beauty and seafood available in the region. 68 people visited the islands around the Tunku Abdul Rahman Marine Park, including Manukan Island, Mamutik Island, Sapi Island, and Gaya Island. In addition, 12 responders visited Teluk Likas and Tanjung Aru beaches to watch the sunset. Some responders also visited Tamu Gaya Street, Sepanggar Island, and Ulu Kionsom Waterfall. According to Paris (2010), although backpackers visit the same popular locations as mass tourists, they also participate in activities that are distinct from them. Backpacker tourism frequently focuses on keeping travel costs low (Riley, 1988; Shaffer, 2004; Teas, 1988). However, a huge percentage of backpackers engage in more expensive, once-in-a-lifetime adventures or adrenaline-fueled sporting activities (Richards & Wilson, 2004).

Diversification of activities available to backpackers in a given region not only allows them to stay longer, but also encourages the establishment of downstream industries in the form of small businesses run by local people to suit the requirements of visitors (Martins & Costa, 2017). According to Hampton (1998), Rogesson (2011), and Scheyvens (2002), backpackers contribute to the growth of businesses that do not require large investments and provide additional income to many families in the destination because they travel in a wider geographical area, sometimes in remote regions, and use local goods. The local community may be involved in serving the requirements of backpackers by selling food, assisting them in their everyday activities, and displaying their culture and customs to tourists (Sailesh & Jingade, 2019; Barroso, 2021; Barroso & Moreira Silva, 2020). This indirectly adds to the location's future development as a backpacker tourist destination.

Based on the successful tourist circuit model by Hardy (2003), what is set as the foundation to the success of a tourist circuit is a unique experience with distinctive attractions on the route that provide a combination of products that suit consumer needs and create a competitive advantage. For example, in a study by Hampton and Hamzah (2016), the tourist circuit of backpackers in Southeast Asia shows that the routes start from Thailand, entering Peninsular Malaysia and continuing their journey to Singapore, Bali before going to Australia. Backpackers like this tourism circuit because of the region's low-cost transit options, which include railways and Air Asia's low-cost airline flights (Hampton & Hamzah, 2016). As a result, in order to enhance backpacker tourism in Kota Kinabalu, tourist circuit demands must be met.

In addition, a backpacker's extended stay in Kota Kinabalu has an impact on the backpacker tourist circuit. The longer backpackers stay in Kota Kinabalu, the more probable it is that they will visit a variety of places. This is confirmed by the findings of a study conducted by Barros and Machado (2010), who discovered that backpackers who stay longer in a place visit more attractions than those who stay for a shorter period of time. The element of flexibility that

defines a backpacker's approach to planning a trip makes them a particularly adaptable group of visitors when it comes to deciding how long to spend in one location before moving on to the next (Elsrud, 2001).

Backpackers try to set themselves apart from mass tourists by visiting different places and participating in different activities, but they face obstacles such as organising their own journey and having little information about the other places they visit (Adam et al., 2021; Laingsingh, 2020; Sailesh & Jingade, 2019). Backpackers who make it to Kota Kinabalu typically travel alone or in small groups and get their knowledge about the places they wish to see from locals or local communities, rather than from tour providers. The attractive sites visited by backpackers in this district are primarily focused in the city centre region, but other attractions located outside of the city centre, such as shown in Figure 4, are less visited.

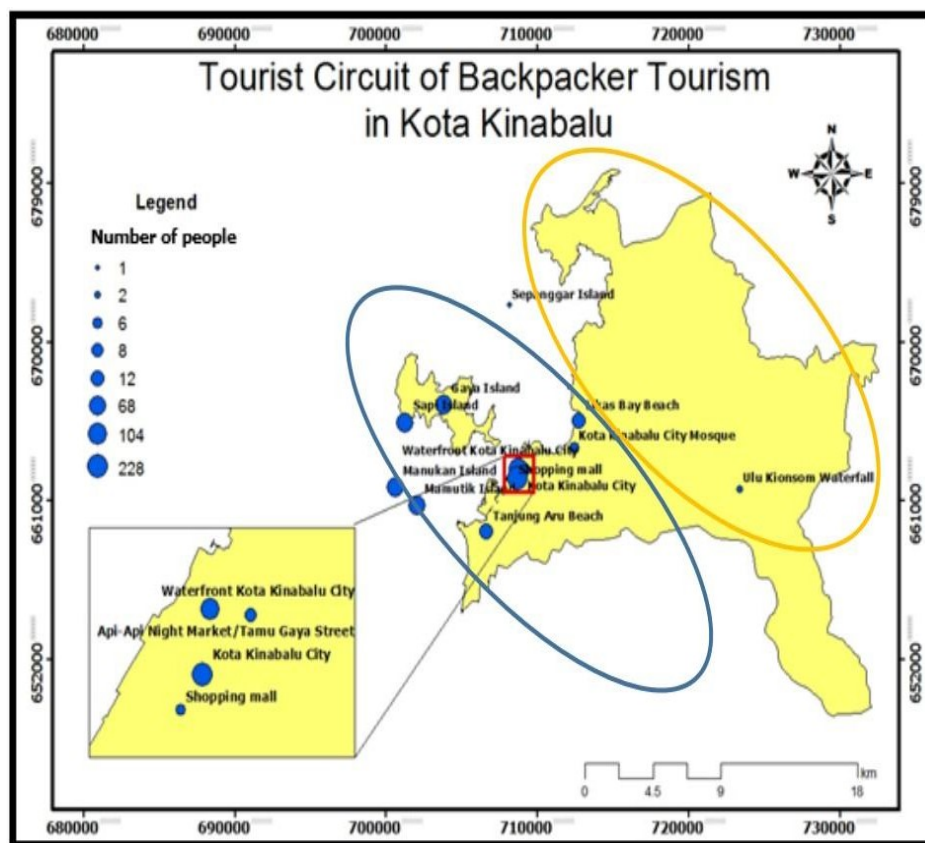


Figure 4: Pattern of backpacker tourist circuits in Kota Kinabalu  
 Source: Field study (2020).

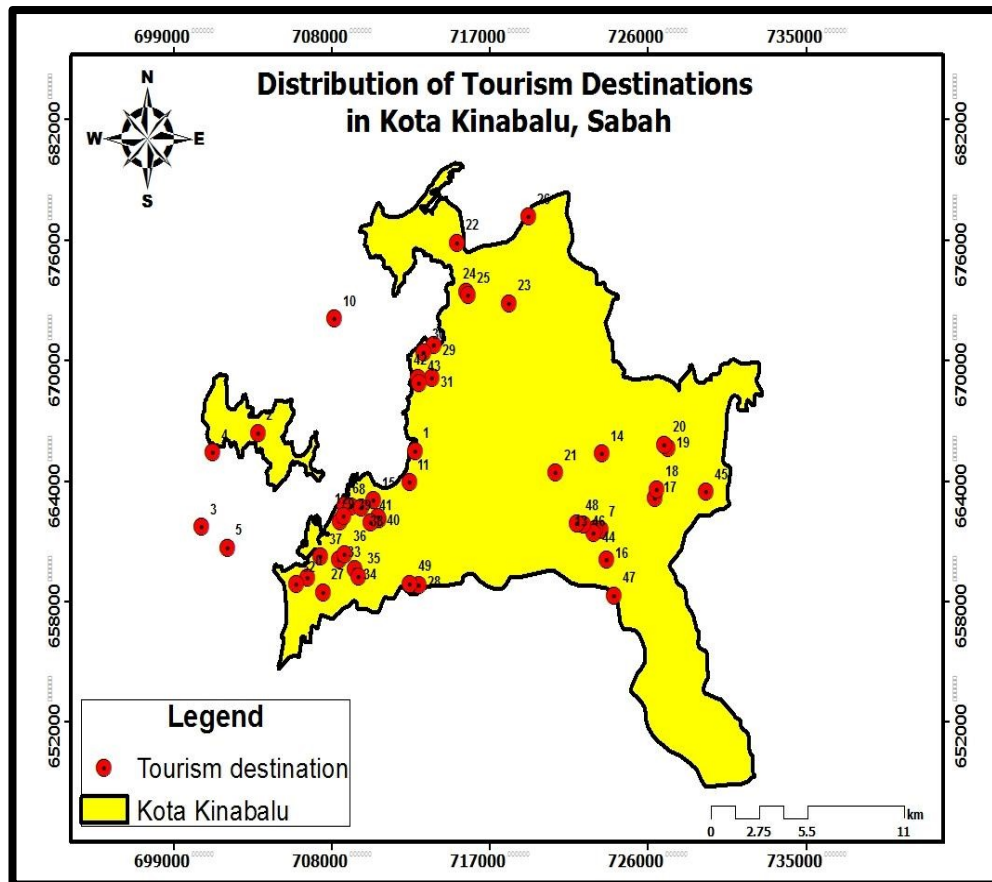
Figure 4 shows that there is a distinct difference between the backpacker tourist circuits accessible in Kota Kinabalu. The blue circle indicates a popular tourist circuit for backpackers in Kota Kinabalu. Meanwhile, the orange circle depicts places in Kota Kinabalu that are less visited or cannot be accessed by backpackers. Due to a lack of integration on the part of the players in the district's backpacker tourism, the budget accommodation providers have no contact with tour operators situated in places remote from the city centre. The lack of information about interesting tourist sites in the orange circle area of Figure 4 also has an impact on the arrival of backpackers. In fact, the potential of tourism products in the orange circle is higher due to the attraction of the highlands that display the beauty of Sabah's unique scenery. For example, around the Bukit Kokol area, the beautiful view of Mount Kinabalu and Kota Kinabalu City can be clearly seen in this place.

Furthermore, although backpackers know about interesting places in the orange area, information about how to get there is not easy to obtain. This area is mostly accessed by local tourists or mass tourists who have a package to go to the place. For some of the backpackers, riding a motorcycle or renting a car is the best way to explore Kota Kinabalu. This is because the public transport facilities that operate to the place are limited and less friendly to backpackers. As a result, backpackers who come to Kota Kinabalu travel only around the city area or spend more of their time relaxing in backpacker hostels before undertaking famous tourist activities in Sabah such as climbing The Mount Kinabalu or diving in the islands in Semporna district.

## **RECOMMENDATION**

### ***Providing a comprehensive tourist destination information network system among Kota Kinabalu's backpacker tourism stakeholders***

In light of the circumstances highlighted in Figure 4, a review on the distribution of tourist destination places in Kota Kinabalu was undertaken to examine the likelihood of backpacker's tourist circuits in Kota Kinabalu if Hardy's (2003) notion of Successful tourism routes is enhanced. Figure 5 and Table 2 provide a list of tourist attractions in Kota Kinabalu.



**Figure 5:** Distribution of tourist destinations in Kota Kinabalu, Sabah  
*Source: Researcher's analysis (2020)*

**Table 2:** Names of Tourist Destinations in Kota Kinabalu

No.	Touristic destination	No.	Touristic destination	No.	Touristic destination	No.	Touristic destination
0.	Tanjung Aru Beach	14.	Kokol Hill	28.	Bukit Padang Hiking Trail	42.	UMS ODEC Beach
1.	Likas Bay Beach	15.	Kota Kinabalu Ramsar Site	29.	Bukit Tuah	43.	Aquarium & Marine Museum UMS
2.	Gaya Island	16.	VV Land	30.	Bukit Helang	44.	Nuluhon Garden Retreat House Inanam

3.	Manukan Island	17.	Papas Eco Camp Marahang	31.	UMS Peak	45.	D'Bakie Eco Camp
4.	Sapi Island	18.	CL Rindu Farmstay	32.	Taman Tasik Perdana	46.	Homestay Desa Cinta Kobuni
5.	Mamutik Island	19.	Natai Adventure & Cultural Centre	33.	Sabah State Museum	47.	Eco-Tourism Kg. Kolosunan
6.	Kota Kinabalu Waterfront	20.	Tamaza Acv	34.	Kota Kinabalu Heroes Monument	48.	Shallom Valley Park
7.	Ulu Kionsom Waterfall	21.	Pulutan Happy Farm	35.	Sabah Art Gallery	49.	Kampung Nelayan Floating Restaurant
8.	"Tamu" Gaya Sreet	22.	Bukit Merah	36.	Sabah Museum of Islamic Civilization		
9.	Shopping centre	23.	Bukit Janggut	37.	Double Six Memorial		
10.	Sepanggar Island	24.	Bukit Gentisan	38.	Signal Hill Eco Farm		
11.	Kota Kinabalu City Mosque	25.	Bukit Botak	39.	Sabah Indoor Climbing Centre		
12.	Kota Kinabalu City Centre	26.	Bukit Tirig	40.	The Jungle Skate park		
13.	Mari-Mari Cultural village	27.	Bukit Kopungit	41.	Green Connection, Aquatica Aquarium & Discovery Centre		

*Source: Researcher's (2020).*

Based on Figure 5 and Table 2, the distribution of tourist destinations available in Kota Kinabalu is many and not only concentrated in the city area. Many tourist attractions are yet unexplored by the respondents in this study. One of the reasons is due to a lack of good promotion for the tourist attraction in Kota Kinabalu, which serves as an accommodation centre for backpackers that visit

this area. Budget accommodation operators in Kota Kinabalu lack information on how to travel to the destination; in fact, there is less information network between tourism destination operators and budget accommodation operators in this region. Looking at this situation, the promotion or provision of information about tourist destinations available in Kota Kinabalu needs to be expanded further in order to penetrate the international tourism market, especially backpackers. This is so because it will help in further diversifying the tourist circuit that can be explored by them while traveling in Kota Kinabalu. As a response, all stakeholders involved in backpacker tourism should focus their marketing and promotion strategy on internet information sources, with a particular emphasis on search engines (Martin et al., 2022).

According to Hardy (2003), there are three stages of tourist circuit development that may be explored in order to highlight the importance of interrelationships between parties participating in the tourism industry. First, there is a need for an effective and user-friendly information network, which is backed by information centres and community services. The integrated tourist information is capable of facilitating the search and exchange of information about tourism locations, regardless of whether the operators in the tourism sector, workers in the tourism sector, or for the public's convenience. He also emphasised that for the comfort of tour operators, a successful tourism circuit should include a package of tour activities and tourist services. It is difficult to promote a tourist location if it moves on its own without the assistance of local tour companies. For example, Romania's efforts to develop and promote tourism in rural regions have been completed with help from European Union (EU) subsidies since 2000 (Sima, 2016). The top step of a successful tourist circuit concept is a well-managed network with collaboration and agreement among tourism stakeholders (Hardy, 2003). A well-managed tourism destination by all tourism stakeholders is not only capable of developing a destination but also of contributing to the success of tourism circuits that incorporate many tourist sites at the same time.

***Increase the number of tourist circuits available in Kota Kinabalu***

Because of the diversity of attractions accessible in this area, the backpacker tourist circuits in Kota Kinabalu have a lot of potential to expand. The growth of tourism destinations in Kota Kinabalu may be split into many tourist circuits. Table 3 highlights the various tourist circuits that may be established in Kota Kinabalu.



**Table 3:** The various types of tourist circuits that may be found in Kota Kinabalu

<p><b>Island tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Gaya Island</li> <li>2. Manukan Island</li> <li>3. Sapi Island</li> <li>4. Mamutik Island</li> <li>5. Sepanggar Island</li> </ol>	<p><b>Eco-tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Nuluhon Garden Retreat House Inanam</li> <li>2. D'Bakie Eco Camp</li> <li>3. Eko-Pelancongan Kg. Kolosunan</li> <li>4. Tamaza Acv</li> <li>5. Shallom Valley Park</li> <li>6. Air Terjun Ulu Kionsom</li> <li>7. Pulutan Happy Farm</li> <li>8. Kota Kinabalu Ramsar Site</li> <li>9. Papas Eco Camp Marahang</li> <li>10. CL Rindu Farmstay</li> </ol>
<p><b>Food tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Kota Kinabalu Waterfront</li> <li>2. "Tamu" Gaya Street</li> <li>3. Signal Hill Eco Farm</li> <li>4. Kampung Nelayan Floating Restaurant</li> </ol>	<p><b>Culture tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Mari-Mari Cultural village</li> <li>2. "Tamu" Gaya Street</li> <li>3. Sabah State Museum</li> <li>4. Sabah Art Gallery</li> </ol>
<p><b>Hill climbing tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Bukit Merah</li> <li>2. Bukit Janggut</li> <li>3. Bukit Gentisan</li> <li>4. Bukit Botak</li> <li>5. Bukit Tirig</li> <li>6. Bukit Kopungit</li> <li>7. Bukit Padang Hiking Trail</li> <li>8. Bukit Tuah</li> <li>9. Bukit Helang</li> <li>10. UMS Peak</li> </ol>	<p><b>Educational tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Universiti Malaysia Sabah</li> <li>2. Aquarium &amp; Marine Museum UMS</li> <li>3. Sabah State Museum</li> <li>4. Sabah Museum of Islamic CivilizationGreen</li> <li>5. Connection, Aquatica Aquarium &amp; Discovery Centre</li> </ol>
<p><b>Religious tourism circuits:</b></p> <ol style="list-style-type: none"> <li>1. Kota Kinabalu City Mosque</li> <li>2. Sabah Museum of Islamic Civilization</li> <li>3. Sabah State Mosque</li> </ol>	

Source: Researcher's (2020)

Based on Table 3, it is clear that the plan to diversify tourist circuits in Kota Kinabalu is essential to enhancing the quality of tourism products available in this area. According to Fratu (2020), the tourist inclination toward some locations highlights the need for contemporary methods and marketing tactics that apply to tourist destinations on a conceptual level. As a result, in Kota Kinabalu, the notion of establishing these tourist circuits is required. This is due to the fact that specialisation of tourist circuits based on visitor interests would allow the

locations involved to gain a target market that matches the context of tourism products supplied by them. A circuit system is being developed to allow for the diversification and expansion of experience alternatives for tourists and residents, as well as the establishment of service and product chains to ensure that the tourism benefit is shared (Ángeles et al., 2020).

Because specific planners have been created based on the requests or interests of backpackers who visit Kota Kinabalu, it will be easier for stakeholders in the tourism sector in Kota Kinabalu to develop public facilities such as bus transport routes, tourism information systems such as tourism maps, and so on. According to Martin et al. (2022), stakeholders in backpacker tourism must invest in order to improve the adventure experience while travelling and help to spread good information among travellers. This is because the information offered by other travellers is the most useful to them on the day of the adventure journey. As a result, the specialisation of the tourist circuit, as shown in Table 3, has a high potential for improving the quality of tourism products in a tourism destination such as Kota Kinabalu. Finally, the specialisation of this tourist circuit will not only benefit the development of backpacker tourism in Kota Kinabalu but may even become a model in the development of tourism in Sabah.

### **CONCLUDING REMARK**

This study on the tourist circuit of backpacker tourism in Kota Kinabalu bears important findings and contributes towards the development prospects of the tourism industry in the future. First, this study has successfully described the initial planning of the purposes of backpackers who travel in Kota Kinabalu. Secondly, this study also discussed the tourist circuit patterns of the backpacker inside and outside Kota Kinabalu in particular. To sum up, backpacker tourism has a great deal of potential to develop and become one of the types of tourism that defines Kota Kinabalu's tourism industry. Despite the travel restrictions imposed by the COVID-19 outbreak that has gripped the world today, research on backpacker tourism is critical in order to improve the future quality of tourism in our country. As a result, the government and related parties should step up their efforts to promote backpacker tourism in Kota Kinabalu on a global scale.

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## **CHANGE OF FOREST LAND USE BASED ON CONSERVATION POLICY AND PRACTICE: A CASE STUDY IN DANUM VALLEY, MALAYSIA**

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### **Abstract**

Southeast Asia's forest and green areas are undergoing a fast and substantial experienced sudden change, depending on complex area management issues resulting in deforestation, including Danum Valley, Sabah, Malaysia. The study purposely to determine the land-use pattern at Danum Valley through a geospatial approach. GIS data was collected from government official departments such as the Sabah Forest Department and Urban and Regional Planning Sabah Department. Land-use changes analysis, namely Relative land use percentages and matrix analysis used to understand the changing pattern and current scenario of land use activity at Danum Valley. Preliminary findings indicate a change of forest land use from Class 2 Commercial Forest Reserve into Class 1 Protected Forest Reserve during the three times series within an area of influence near Danum Valley.

**Keyword:** Conservation, Danum Valley, GIS

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## **INTRODUCTION**

The change in land use refers to human activity on land (Abdul Latip et al., 2013). In contrast, land cover refers to the physical condition of the soil (Turner & Meyer, 1994), and Pacione (2005) affirmed that land-use change is more focused on human activities where people are involved in the transformation of non-urban land into urban land use. Land cover is a layer of soil and biomass that includes natural plants and artificial structures covering the soil surface. In contrast, land use refers to the purpose of human exploitation of the land cover, for example, several human activities such as agriculture, building construction, and forestry (Fresco, 1994). The change in land use and the land covered naturally or anthropogenic activities have led to the loss of biological diversity caused by deforestation, global warming, and increased natural disaster such as floods (Dwivedi et al., 2005). A monitoring mechanism is crucial (Latip et al., 2020) to avoid destructive forest resources. Effective management of forests is a critical element of future forest conservation that is essential for both long-term stability and the short-term productivity of the forest ecosystem (Andrew et al., 2000). Therefore, this study is to identify the patterns of land-use change occurring in Danum Valley, Sabah, based on the conservation management plan and policy

## **RESEARCH BACKGROUND**

Land use is defined as a series of operations toward land area done by humans, with the reason to get product and benefits through using natural resources (Ryan, 2013). Land use refers to the purpose of the land functionality, for example, habitat for wildlife, agriculture, or recreation, which does not describe the surface cover on the ground. Land-use change is considered one of the foremost critical environmental problems globally (Veldkamp & Lambin, 2001). An understanding of land use theory and practice aided by strict rules and regulations ensures the effectiveness of actions and principles of an area to care for. As well as the Danum Valley. Many theories and practices of law dictated the conservation effort in the area.

- **Theory of Land Use Planning**, based on (Chapin, 1965), the land-use planning theories refer to a system of thought generated through logical utterance or systematic formulation that complements and explains land use. It covers the question of why it exists, how it develops, what changes in land use are taking place, and the basic structures and forms of components in land use activities. Theory often provides a rationale for making predictions. Observing similarities or determining behavioural phenomena in real life seeks to prove the future through these phenomena

based on behavioural assumptions. The theory can provide guidelines for implementing a choice between alternatives for planning decision-making.

- **Land Use Planning** is generally part of an overall process in urban and regional areas. Based on (Chapin, 1965), land use planning should emphasise the location, intensity, and development required for different spaces. Land use maps are significant for urban planning and management (Hu, Yang, Li, & Gong, 2016). Land Use Planning is a land governance instrument usually employed to safeguard land areas, restrict human activities toward natural areas, and strengthen the land systems to ensure land sustainability (Briassoulis, 2019). Land use planning is a crucial determinant for green spaces as it defines the land covers and performance of urban ecosystems. Therefore, the benefits for humans (Langemeyer et al., 2016)
- **Land Ordinance (Sabah Cap. 68)** as indicated by the (Land Ordinance, 1968); the Sabah Land Ordinance is the primary legislation in Sabah for land classification and allocation for owner rights and titles toward land. It also rules over revenue collection, land survey and delimitation, implementation of enforcement, and punishment toward related land and land ownership offences. Important legislation that the subsidiary passed under the Ordinance are such as Land Rules 1930, Land Rules (Temporary Planning Permit) 1948, Rent Revision Rules 1958, The Land Control (Control and Management of Sipadan Island) Rules 1996, and Land (Quarry) Rules 1997. 13. The Sabah Land Ordinance states that “State land” means all lands which have not been and may not hereafter be reserved for any public purpose, or which have not been and may not hereafter be leased or granted to, or are not and may not subsequently be lawfully occupied by any person. As well as forest land.

The world has recognised the importance of forests for all life and prioritised the preservation of forests through many policies and practices. However, recent data show that forest area has declined despite acknowledging their importance for conservation (Keenan et al., 2015), including Sabah Forest. The Forest Enactment 1968 (Forest Enactment, 1968) is an enactment by Sabah Legislature in 1968 as the basis for forest law in Sabah. This enactment seeks to replace the law (Ordinance No. 11, Timber and Jungle Produce) relating to forest preservation, the regulation, control of all forest produce, and related and incidental matters. The Forest Enactment 1968 passed through amendments that contained 43 provisions with five sections. This enactment includes requirements for creating and abolishing forest reserves. The Sabah Forestry Department will carry out the implementation and management of the enactment. After being advised by the Chief of the Forest Conservation, the Minister may amend any regulations



considered appropriate, valuable, and necessary to carry out this enactment's provisions better.

Sabah has a vast forest area and resources, which the authorities divided into many types of forest reserves. The classification range below is based on Sabah Forest Department and The Forest Enactment 1968.

**Table 1: Class and Types of Forest Reserves**

Class	Forest Reserves
1	Conserved especially for protection and conservation of forest area. This forest is protected by law and rules by the state authorities from changing the use of the land into other land use or deforestation such as timber exploitation.
2	Commercial forest. This forest is used to produce timber supply or other products based on forest used to profit for the state's economy. The harvesting is based on the Sustainable Forest Management (SFM) principles.
3	Domestic Forest Reserves. This forest is reserved mainly for a minor harvesting forest supply for the local communities or natives living near the forest area where commercial use is not encouraged.
4	Amenity Forest Reserves that mainly used for general public recreational opportunities. This forest provided a public facility to attract the site for public use and usually reserves along roadsides.
5	Mangrove production activities. This forest supplies mangrove timber, and other forests mainly focus on mangrove products, such as firewood and charcoal.
6	Virgin Jungle Reserves. Like the class 1 protection forest where timber logging and deforestation are prohibited. Its primary purposes are to conserve forest research, including biodiversity and generic conservation.
7	It is strictly protected by law because it is known as a Wildlife reserve. Any logging activity is prohibited and used to conserve, protect, and research wildlife such as the Sumatran Rhinoceros.

Source: Sabah Forest Department, 2021

The Forest (Danum Valley Conservation Area) Rules (1996) and laws apply only to Danum Valley Forest Reserve. The enactment provided a list of Danum Valley Conservation Management Committee where they're assigned to advise the Director of Danum Valley about the area's development. The legislation shows the management committee list, each committee's role, and its powers and functions as a management committee. The government's effort to conserve the area is well demonstrated in policy, rules and regulations imposed on the Danum Valley forest reserve.

### **Study Area**

Sabah is the second largest state in Malaysia, located north of Borneo. Sabah covers an area of 72 500 square kilometres with a coastline of 14 400 kilometres, with the South China Sea situated on the west coast, the Sulu Sea on the northeast, and the Celebes Sea on the South. Sabah is centred on latitude and longitude 5.420404° N and 116.796783° E and divided into five administrative divisions: Tawau, Sandakan, West coast, Kudat, and Interior, with each division consisting of several districts which total 27 districts. Sabah local governments are under the control of the state government. Danum Valley is located in Tawau Division with about 438 km<sup>2</sup>. The nearest town to Danum Valley is Lahad Datu, about 82 km away with a 2-hour drive on the logging road.

Based on Sabah Structure Plan 2033 (Town and Regional Planning Department Sabah, 2016), there are three strategies for Sabah's development: provide for sustainable population growth in the north and the interior areas of Sabah, develop functional distribution growth centres, and create Special Economic Zones. There are three sectors of the Special Economic Zone, namely the tourism zone, industrial zone, and agriculture zone. Danum Valley is a tourism zone and falls under Tawau division development strategies with one municipal council and three districts: Tawau, Semporna, Kunak, and Lahad Datu. Based on Sabah Structure Plan 2033, Danum Valley is developing the tourism sector. Danum Valley is under Sabah Development Corridor (SDC) investment and development for Entry Point Projects (EPP) to drive economic growth in Sabah. For the existing situation, Danum Valley has become ecotourism with a rainforest experience product based on Malaysia's premier ecotourism destination promoted.

### **METHODOLOGY**

A Geographical Information System or GIS, as indicated by Noor et al., 2013; Ibrahim et al., 2016), is a method of marking the mapping of an area based on geospatial data on the existing topography or for future planning. It uses the overlay technique method that details the categories of information according to geographical taxonomy, such as plants, rocks, buildings, soil, soil layers and minerals, including the movement of life on earth. According to current needs and activities, it facilitates development planning and control of strategic areas such as cities, states, borders, forest reserves, mining industry, coastal areas, etc. In general, the basic requirements of GIS are the current map of the area under study and the input and production output integration information according to the needs of individuals, groups, non-government and government. This study focuses on the Danum valley's current condition of forest reserves. The geographic data of Danum Valley land use were obtained from government agencies such as the Sabah Forestry Department and the Urban and Regional

Planning Sabah Department. GIS ArcMap 10.4 software (Chang K. T., 2008) is used as an instrument, with metadata, namely the overlay method using vector data and matrix method using raster data.

As for land use changes analysis, the formula of the land-use changes (Hu et al., 2007; Narimah et al., 2010) indicates changes from year to year. The procedure is shown below:

$$\%B_{i,j}^{t \rightarrow t+n} = \left( \frac{B_{i,j}^{t+n} - B_{i,j}^t}{B_{i,j}^t} \right) \times 100$$

Which

$\%B_{i,j}^{t \rightarrow t+n}$  : Percentage of land use change from time t and time t + n,

$B_{i,j}^{t+n}$  : Size of development area from time t + n, and

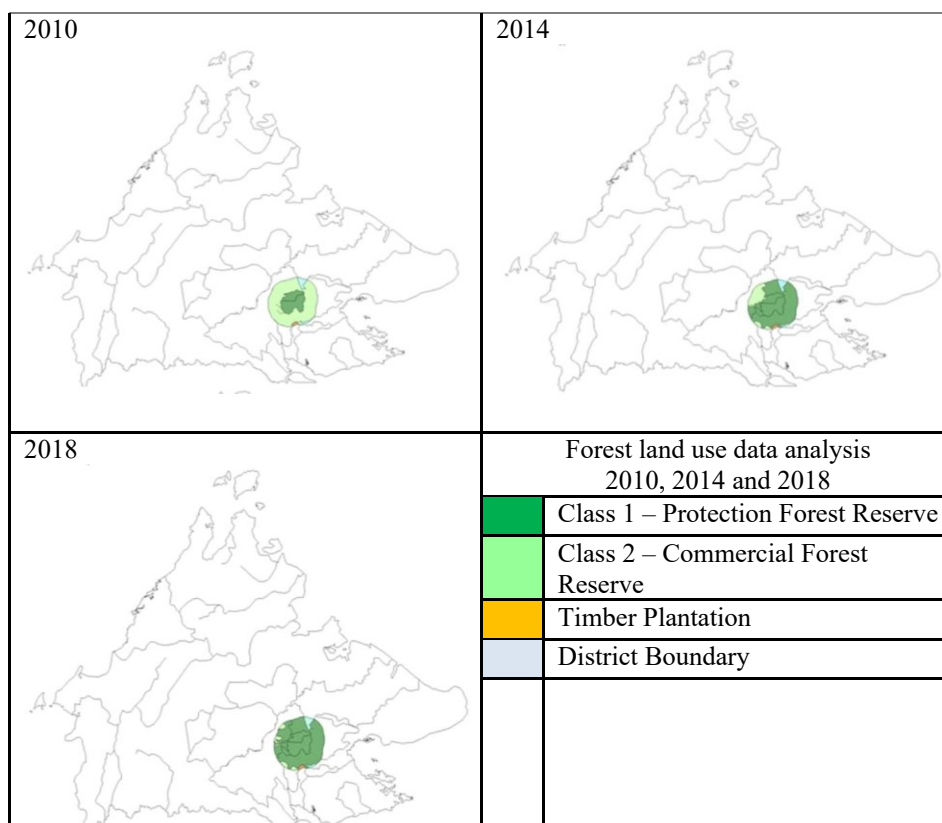
$B_{i,j}^t$  : Development area from time t

## **ANALYSIS AND FINDING**

The discussion of this analysis is divided into sections: land use analysis through the GIS overlay method, the percentage change of land use by using the percentage change of land use formula and matrix analysis. Based on Reynolds et al. (2011), Danum Valley has become a Class 1 Protection Forest Reserve since 2010, showing no change in Danum Valley land use. Therefore, this study will include the change in land use based on two-zone of influence (100 km<sup>2</sup> and 200 km<sup>2</sup>) near the Danum Valley area.

### *Overlay Method using GIS*

Relative land use percentages were conducted in three-time series in 2010, 2014, and 2018 as shown in Table 5.1. Based on table 5.1 analysis of the year 2010, the Class 2 Commercial Forest Reserve had the most dominant land use size, which had about 1, 669.56 km<sup>2</sup> (74.13 %), followed by the Class 1 Protection Forest Reserve with 465.16 km<sup>2</sup> (20.65 %) which is the Danum Valley area, 62 while the district boundary is 95.49 km<sup>2</sup>(4.24 %). Timber plantation land use is 21.95 km<sup>2</sup> (0.98 %).



**Figure 1:** Changes in Land Use in Danum Valley, Sabah in Years 2010, 2014, and 2018  
*Source: Author, 2022*

In 2014, there was a significant change in forest land use, which has experienced a substantial increase and is dominated by Class 1 Protection Forest Reserve with 1 785.23 km<sup>2</sup>(79.27 %) area. Next, the second with a vastly reduced change in the size of forest land use is the Class 2 Commercial Forest Reserve with 349.49 km<sup>2</sup>(15.52 %) size area, followed by the district boundary is 95.49 km<sup>2</sup>(4.24 %), and timber plantation land use is 95.49 km<sup>2</sup>(4.24 %) which does not change for both land use.

Meanwhile, for the year 2018, the Class 1 Protection Forest Reserve slightly increased to 006.52 km<sup>2</sup>(89.09 %), while the Class 2 Commercial Forest Reserve had another small reduction to 128.20 km<sup>2</sup>(5.69 %). However, both the district boundary and timber plantation do not have a land-use change which stays at 95.49 km<sup>2</sup>(4.24 %) and 95.49 km<sup>2</sup>(4.24 %). From the analysis, a significant increase in land use is between 2010 and 2014 with a growth of 1, 320.07 km<sup>2</sup>(+58.62 %) area size for the Class 1 Protection Forest Reserve, while a sign

of a decrease in land use also happens between 2010 and 2014 that reduce 1,320.07 km<sup>2</sup> (-58.62 %) for the Class 2 Commercial Forest Reserve. However, there is no land-use change toward timber plantation and district boundary size area for the three times.

**Table 2:** Change of Land Use in Danum Valley in Years 2010, 2014, and 2020

Forest Land Use	2010 km <sup>2</sup>	%	2014 km <sup>2</sup>	%	2018 km <sup>2</sup>	%	Changes by Types of Land Use -km <sup>2</sup>		Percentage Changes (%)	
							2010-2014	2014-2018	2010-2014	2014-2018
C1	465.16	20.65	1785.23	79.27	2006.52	89.09	+1320.07	+221.29	+58.62	+9.82
C2	1669.6	74.13	349.49	15.52	128.20	5.69	-1320.07	-221.29	-58.62	-9.82
TP	21.95	0.98	21.95	0.98	21.95	0.98	0	0	0	0
DB	95.49	4.24	95.49	4.24	95.49	4.24	0	0	0	0
Total	2252.6	100	2252.16	100	2252.16	100				

Source: Author, 2022

### Matrix Analysis

The matrix analysis shows the existing type of land use into other land use based on two different studies that will show how much the size of the area has changed during each year and the cause of the change.

**Table 3;** Matrix Analysis Method of Land Use Change Years 2010 - 2014

Year	2014 (km <sup>2</sup> )					
	Forest Land Use	Class 1	Class 2	TP	NRF	Total (2010)
2010 (km <sup>2</sup> )	Class 1	465.1				465.1
	Class 2	1320.07	349.49			1669.56
	TP			21.95		21.95
	DB				95.49	95.49
	Total (2014)	1785.23	349.49	21.95	95.49	2252.16

Source: Author, 2022

Table 3 indicates that during 2010 – 2014, about 1,320.07 km<sup>2</sup> had Commercial Forest Reserve land use hugely changed into Class 1 Protection

Forest Reserve. This change caused the reduction of class 2 forest land use as it became 349.49 km<sup>2</sup> in 2014 from the total area of 1 669.56 km<sup>2</sup> in 2010. However, there is no land-use change for timber plantation and district boundary between that two different year

**Table 4;** Matrix Analysis Method of Land Use Change Years 2014 – 2018

Year	2014 (km <sup>2</sup> )					
	Forest Land Use	Class 1	Class 2	TP	NRF	Total (2014)
2010 (km <sup>2</sup> )	Class 1	1785.23				1785.23
	Class 2	221.29	128.20			349.49
	TP			21.95		21.95
	DB				95.49	95.49
	Total (2018)	2006.52	128.20	21.95	95.49	2252.16

*Source: Author, 2022*

Table 4 shows only the correct change in land use between class 1 and class 2 forest land in the year 2014 - 2018. The class 1 forest land use increased by about 221. 29 km<sup>2</sup> into 2, 006.52 km<sup>2</sup> which changed from class 2 forest land use. This change caused only 128.20 km<sup>2</sup> area left for class 2 in 2018. However, the timber plantation and district boundary stay the same as there is no change in land use.

### CONCLUDING REMARK

Generally, there is no land-use change in Danum Valley in the three times series. However, there is a change in land use in the zone of influence near Danum Valley. The difference is because of the increase of Class 1 Protection Forest Reserve in Sabah. Plus, the study also indicates the direction of Danum Valley development from the year 2010 to 2018. The main focus of land use in Danum Valley is on conservation areas with minimal tourism activity and more emphasis on research and education. Therefore, this study can clearly show the direction of development and land use in Danum Valley, Sabah.

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## **COMPARISONS OF TOURIST CIRCUIT PATTERN AT SELECTED TOURISM DESTINATION IN SABAH, MALAYSIA**

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### **Abstract**

The tourist circuit pattern is one of the factors that are influenced by tourists' willingness to pay for a vacation at a tourist destination. As such, this article will examine the relationship between tourist space and willingness to pay in Kundasang - Ranau and Kota Belud, Sabah. The assessment and case study methods were used in the research. The study used quantitative methodologies, including a questionnaire survey of 150 respondents who visited selected tourist locations in Kundasang-Ranau and 93 respondents who visited Kota Belud. The survey's findings indicated that the majority of respondents (87.3% - Kundasang, Ranau) and (61.3%- Kota Belud) who visited the two study locations traveled privately and prioritized destinations they had never visited while selecting tourist destinations. The majority of respondents (70%) in Kundasang - Ranau agreed that the fee rate charged has an effect on the direction of their journey. In Kundasang - Ranau, the respondent's roaming space is dictated by the tourism package, and the tourist attraction visited by the respondent is nearby, whereas in Kota Belud, the opposite is true. Following that, the bulk of respondents who arrived at Kota Belud were determined by their roaming space in accordance with the institution or organization's determination. The study's findings also revealed that the majority of respondents who visited the two study areas did so on their own and that the tourist destinations visited were relatively near together.

**Keywords:** Tourist Roaming Space, Willingness to Pay, Tourism

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## **INTRODUCTION**

Tourism is the travel of people in a short period of time to a destination that is not their home or place of work (Muljadi, 2009; Yu et al., 2017). Tourism is defined by Vanhove (2005) and Badrudin (2001) as a temporary visit activity that lasts at least 24 hours in the location visited. The UNWTO (2020) underlines that tourism is a social, cultural, and economic phenomenon that entails a person traveling to a country or location beyond their normal environment for personal, business, or professional reasons. Tourism geography considers a variety of factors, including tourism activities that are spatial in nature. In this sense, the spatial dimension of tourism activities can be viewed on four distinct scales: global, national, regional, and local (Pearce, 1995; Lau & McKercher; 2006).

Tourism research entails three major geographical components in the movement of a tourist. Among these components are tourist-generating places, tourist destinations, and travel routes connecting two groups of locations referred to as transits (Leiper, 1979; Leiper, 2004; Flognfeldt, 2005). When tourists engage in tourism activities, this mobility results in the creation of the idea of tourist space. A tourism wildlife route is one that connects at least three main tourist locations (Dam, 2016; Leiper, 1979; Cullinan, 1977). The tourism spots are in close proximity to one another. According to Chowdhury (2011), the tourist circuit pattern is influenced by the short stay period at each stop on the promenade, the planned route, and the classification of provincial and local tourism attractions. According to Sisodia (2011) and Lau and McKercher (2006), tourist roaming spaces can be formed within a country (intra-border) or between two or more countries (inter-border) (cross-border).

According to Syed Muhammad Rafy and Hairul Nizam (2014), it is critical to understand tourist circuit pattern in order to create a more acceptable tour pattern and to offer intriguing sites and quality selections. A better understanding of how tourists move through diverse locations will have a bigger impact on the construction of infrastructure and transportation (Crouch & Ritchie, 1999; Edward & Griffin, 2013; Syed Muhammad Rafy & Hairul Nizam, 2014). Dejbakhsh (2009) and Nor Afifin et al. (2021) emphasized that the characteristics of tourist movement can be classified into two broad categories: the destination, or the goal of the visit, and the characteristics of the tourist visit. These two factors vary according to the type of visitor. According to some experts, the primary factor affecting a tourist's wildlife space is the tourist's own conduct. Simultaneously, the movement of travelers might reveal a tourism destination's attraction (Kim et al., 2018; Zhong et al., 2019). The purpose of this study is to explore the relationship between willingness to pay and tourist space in two study regions in Sabah, namely Kundasang - Ranau and Kota Belud. The purpose of this study is to evaluate the relationship between willingness to pay and visitor roaming space. Additionally, the importance of fee payment rates in determining

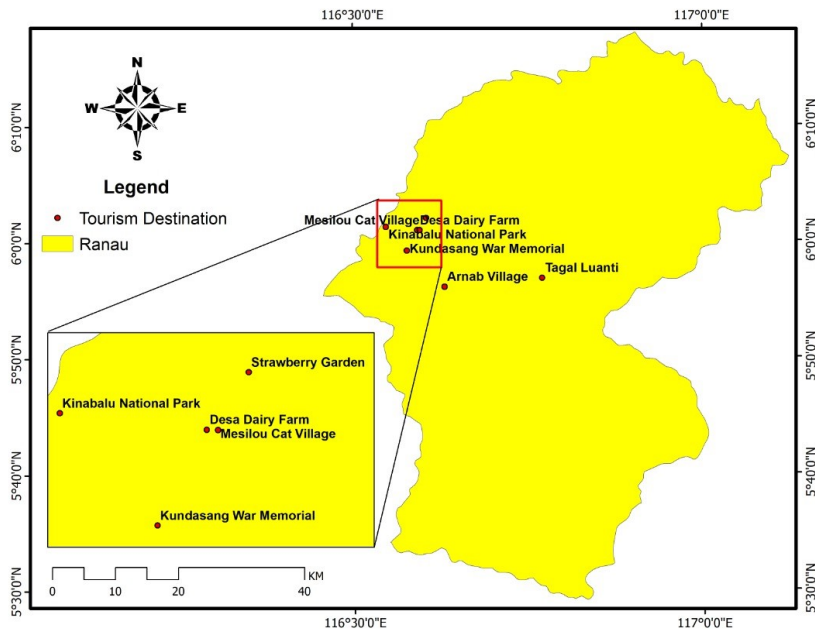
the direction of tourist travel was analysed, as were the primary characteristics considered by respondents when choosing a tourist location.

## MATERIALS AND METHODS

### Study Area

#### (i) Kundasang - Ranau

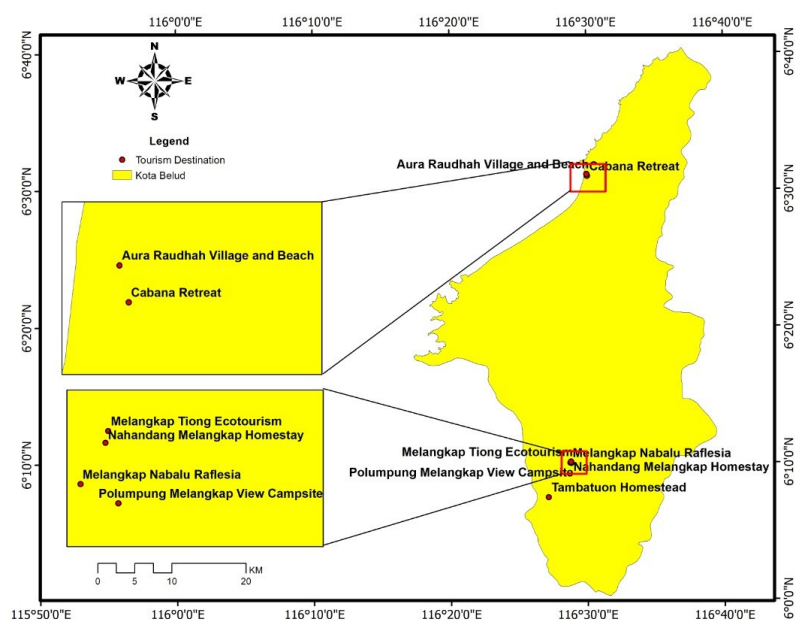
Kundasang-Ranau, Sabah is a locality in the Ranau district of Sabah, Malaysia. It is located in the Crocker Range at an elevation of around 4,000 to 6,000 feet above sea level. Kundasang is surrounded by lush evergreen trees. The Kinabalu Park is located four kilometers from the town of Kundasang. It contains one of the world's oldest tropical forest reserves and is rich in biodiversity. Mount Kinabalu, Southeast Asia's highest peak, is located within this forest reserve region. It is the pride of the state of Sabah. Kundasang is 15 kilometers from Ranau town. This region is home to several significant villages, including Lembah Permai, Cinta Mata, Kaulan, Sinisian, Dumpiring, and Kinasaraban. The distance between Kota Kinabalu's city center and Kundasang is approximately 92 kilometers. Kinabalu National Park, Strawberry Garden, Kundasang War Memorial, Desa Dairy Farm, and Mesilou Cat Village are the five tourist places investigated in Kundasang, while Arnab Village and Tagal Luanti, Kampung Luanli, Ranau are the two research locations in Ranau.



**Figure 1:** Study Area in Kundasang, Sabah  
*Source: Modified from Google Earth (2021).*

**(ii) Kota Belud**

Kota Belud is a district located in the West Coast, Sabah. The distance of this area to Kota Kinabalu is about 70 kilometers. The district has several villages such as Kampung Rampayan, Kampung Siasai, Kampung Sembirai, Kampung Pirasan, Kampung Kulambai and Kampung Kelawat (Jabil et al., 2021). There are many tourist destinations in Kota Belud, but only seven tourist destinations were selected in this study, namely Polumpung Melangkap View Campsite (PMVC), Cabana Retreat, Melangkap Nabalua Rafflesia, Tambatuon Homestead, Ekopelancongan Melangkap Tiong, Aura Raudhah Village Beach and Nahandang Melangkap Homestay and Campsite.



**Figure 2: Study Area in Kota Belud, Sabah**  
 Source: Modified from Google Earth (2021).

**Methods**

The researcher focused on analyzing and compare the patterns of tourist wandering space in two selected resort areas in this study. As a result, a survey and a case study were employed to conduct the study. A survey design is a systematic process for gathering data directly from a target population (Kraemer, 1991; Showkat & Parveen, 2017). A survey is a type of scientific inquiry that focuses on individuals, significant facts, beliefs, views, attitudes, motives, and actions (Mathiyazhagan & Nandan, 2010; Salaria, 2012). Case studies are a frequently utilized tool in the social sciences (Cope, 2015). Case studies should

be simple to comprehend in order to accomplish the researcher's purpose of identifying the study's issue and then comparing it to prior research to ensure the study's reliability (Guftasson, 2017; Faridah & Mohd Razimi, 2021).

In Kundasang - Ranau, the number of respondents involved is 150 people while in Kota Belud, the study involved a total of 93 respondents. The targeted sample in this study is visitors who come to selected tourist destinations in both study areas. The sampling method used is simple random sampling, i.e. all visitors who come to the study location have an equal chance of becoming study respondents.

In this study, data related to the travel status of respondents to tourist destinations, the influence of fees in determining the tourist locations visited by respondents and the main criteria taken into account by respondents in choosing tourist destinations to visit are analyzed using Statistical Package for The Social Science software. (SPSS). Then, the analyzed data will be presented in tabular form taking into account the total frequency and percentage. For data related to tourist wandering space in tourist destinations determined by the tourism package, organization or institution and privately is presented in the form of tourist wandering frequency mapping. This mapping is made and analyzed using basic Geographic Information System (GIS) software.

## **RESULT AND DISCUSSION**

### **The Relationship between Willingness to Pay and Tourist Circuit Pattern**

According to Table 1, the respondents' travel status to the tourist sites analyzed was classified into three distinct categories. The study's findings indicated that the majority of respondents who travelled to the two selected tourist sites did so privately. This demonstrates that the communication system to tourist locations is effective, as it enables tourists to travel independently and choose their destination. These findings corroborate Alias et al. (2016)'s assertion that Malaysian tourists are extremely sensitive to cost and pricing changes in tourist sites. The increase in pricing will result in a drop in visitor arrivals, as competing places offer lower prices. Due to the changing nature of the tourism market, tour operators must alter the activities and packages they offer travelers to reflect the present scenario. Travel packages are a fundamental product for tour package operators, and a significant portion of their income are generated from tour package revenues (Huang et al., 2010; orevi & Hristov-Stani, 2016).

**Table 1:** Tourist Travel Status to Tourism Destination

Travel Status	Kundasang - Ranau		Kota Belud	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Trip is set in the tour package	11	7.3	3	3.2
Trip is set by organization (university, school, department)	8	5.3	33	35.4
Trip is set privately	131	87.3	57	61.3

### Payment Rates and Tourist Travel Direction

The relevance of payment rates in determining the locations visited by respondents in tourist destination areas is seen in Table 2. The findings indicate that there are disparities in the importance of fee payment in influencing which tourist destinations respondents visit in both study areas. The majority of respondents who visited selected tourist locations in Kundasang - Ranau agreed that the payment rate has an effect on their decision regarding which tourist destinations to visit. According to respondents who visited Kota Belud, they believed that the fee rate had little bearing on their decision to visit a tourist location. The outcomes of this study indicate that price supply has a significant impact on tourist travel since it relates to the quantity of money spent. According to the researcher's observations, varying charge prices for different tourist destinations enable tourists to make a choice regarding the tourist destination's direction based on their allocated budget and the level of service available. This demonstrates that travellers are extremely conscientious about the worth of the costs charged at tourist locations.

**Table 2:** Payment Rates Influence Respondent Travel Direction

Variable	Kundasang - Ranau		Kota Belud	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	105	70	45	48.4
No	45	30	48	41.6

### Key Criteria Considered by Tourist in Choosing a Tourism Destination

Five criteria are used to determine respondents' preferences when it comes to selecting a tourist place to visit. The findings indicated that the majority of respondents who visited the two tourist locations chose never-before-visited tourist places as their primary criterion for destination selection. The appeal factor

of a tourist site is the primary aspect that motivates a visitor to attend (Blazeska et al., 2015; Kim et al., 2015). Stepchenkova and Mills (2010) observed that persons who live in close proximity to a tourist site have more accurate and realistic perceptions of the place. The image associated with a tourist site is critical in this scenario. This is because travelers' perceptions of a tourism site will influence their purchasing decisions. If a person has a favorable impression of a tourist destination, their desire to visit that destination is likely to be high (Beerli & Martins, 2004; Bonn et al, 2015).

**Table 3:** Key Criteria Considered in Selecting a Tourism Destination

Criteria	Kundasang - Ranau		Kota Belud	
	Frequency	Percentage (%)	Frequency	Percentage (%)
A tourist destination that has never been visited	59	39.3	34	36.6
Contagious (viral) travel destinations on social media	43	28.7	15	16.1
Entrance fees apply	28	18.7	30	32.3
Plan spontaneous visits by family and friends	12	8.0	3	3.2
On the decision set by the organization promoter	8	5.3	11	11.8

## **TOURIST TRAVEL STATUS TO TOURISM DESTINATIONS**

The findings of this study give insight on the respondents' trip plans as decided by the travel package. This section examines the respondents' journey through three lenses: the previous location, which refers to the respondent's location prior to arriving at the location where the researcher conducted the questionnaire; and the current location, which refers to the respondent's location while conducting the questionnaire with the researcher. Following that, the current location refers to the researcher's meeting with the tourist at the tourist destination, and the future location refers to the tourist's next destination.

### **i) Tourist Trip Determined by Tourism Package**

Based on 150 respondents, a total of 11 respondents who use travel package services to visit Kundasang - Ranau. When the study was conducted, three tourists were in Tagal Luanti, four were in Desa Dairy Farm and four others were

in Taman Kinabalu. These visitors consist of domestic tourists from Kelantan and Johor. Tourist wanderings are as shown in Table 4.

**Table 4:** Tourist Circuit Pattern Determined by Tourism Packages in Kundasang-Ranau

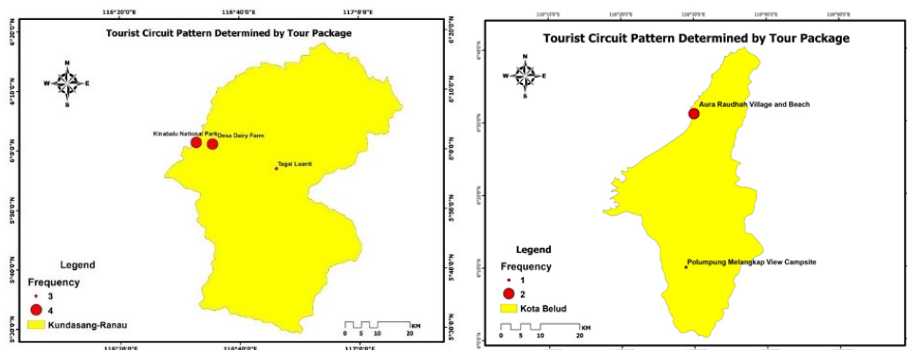
Respondent	Location		
	Before	Current	After
1	Sabah Tea Garden	Duration Luantu	Arnab Village
2	Sabah Tea Garden	Duration Luantu	Arnab Village
3	Sabah Tea Garden	Duration Luantu	Arnab Village
4	Kundasang War Memorial	Dairy Farm Village	Strawberry Garden
5	Kundasang War Memorial	Dairy Farm Village	Strawberry Garden
6	Kundasang War Memorial	Dairy Farm Village	Strawberry Garden
7	Kundasang War Memorial	Dairy Farm Village	Strawberry Garden
8	Kota Kinabalu	Kinabalu National Park	Pekan Kundasang
9	Kota Kinabalu	Kinabalu National Park	Pekan Kundasang
10	Kota Kinabalu	Kinabalu National Park	Pekan Kundasang
11	Kota Kinabalu	Kinabalu National Park	Pekan Kundasang

In Kota Belud, a total of three respondents used the tour package service when visiting Kota Belud, Sabah. When this study was conducted, a total of two respondents were at Aura Raudhah Village and Beach while another was at Polumpung Melangkap View Campsite. Table 5 shows the roaming space of the three respondents.

**Table 5:** Tourist Circuit Pattern Determined by Tourism Packages in Kota Belud

Respondent	Location		
	Before	Current	After
1	Kota Kinabalu	Aura Raudhah Village and Beach	Complementing Tiong Ecotourism
2	Kota Kinabalu	Aura Raudhah Village and Beach	Complementing Tiong Ecotourism
3	Kundasang	Polumpung Completes Campsite View	Kota Belud





**Figure 3 and Figure 4:** Tourist Circuit Pattern Determined by Tour Package in Kundasang-Ranau and Kota Belud, Sabah

The results show that there are significant differences for tourist roaming space determined through tourism packages in Kundasang - Ranau and Kota Belud. Based on Figure 3 and Figure 4, the tourist space in Kundasang - Ranau is focused on nearby tourist destinations only. Compared to Kota Belud, the tourist exit space is quite far away.

**ii) Tourist Trip Determined by Organization or Institution**

This section examines the respondent's travel across three location modes, namely the previous location, which refers to the respondent's location prior to arriving at the site where the researcher conducted the questionnaire. Following that, the current location refers to the researcher's meeting with the tourist at the tourist destination, and the future location refers to the tourist's next destination. Eight respondents had their trip defined by the organization or institution, based on the 150 respondents surveyed. According to Table 6, five out of every eight participants on study excursions are school pupils. Their journey began at Kundasang town and continued to Desa Dairy Farm and Strawberry Garden. According to the researcher, the activities are excellent in terms of providing pupils with the opportunity to discover new places and settings. Following that, the three respondents are public officials that use this tourist location as a layover on their way to Semporna, specifically from Kota Kinabalu. Table 6 illustrates this respondent's wandering space.

**Table 6:** Tourist Circuit Pattern Determined by Organization / Institution in Kundasang - Ranau

Respondent	Location		
	Before	Current	After
12	Kota Kinabalu	Duration Luanti	Semporna
13	Kota Kinabalu	Duration Luanti	Semporna

14	Kota Kinabalu	Duration Luanti	Semporna
15	Pekan Kundasang	Dairy Farm Village	Strawberry Garden
16	Pekan Kundasang	Dairy Farm Village	Strawberry Garden
17	Pekan Kundasang	Dairy Farm Village	Strawberry Garden
18	Pekan Kundasang	Dairy Farm Village	Strawberry Garden
19	Pekan Kundasang	Dairy Farm Village	Strawberry Garden

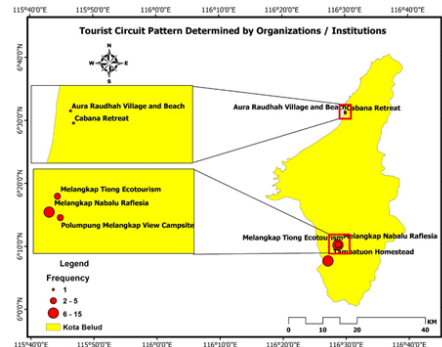
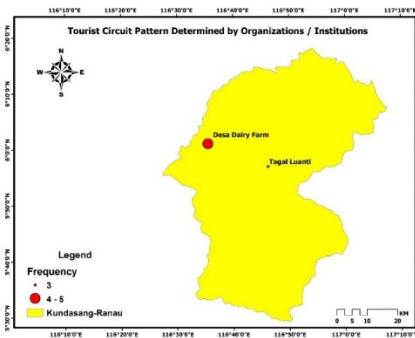
Thirty-three respondents out of the 93 polled had their journeys decided by an organization or institution. According to Table 7, the majority of responders whose journey is dictated by their organization or institution are students. According to observations and questionnaires, a total of 19 respondents are students who attend in groups. Table 7 illustrates the respondent's output space movement.

**Table 7:** Tourist Circuit Pattern Determined by Organization / Institution in Kota Belud

Respondent	Location		
	Before	Current	After
4	Pekan Kota Belud	Ecotourism Complements Tiong	Polumpung Completes Campsite View
5	Pekan Kota Belud	Ecotourism Complements Tiong	Polumpung Completes Campsite View
6	Kota Marudu	Ecotourism Complements Tiong	Polumpung Completes Campsite View
7	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu
8	Kota Marudu	Complementing Nabalua Rafflesia	Tambatuon Homestead
9	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu
10	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu
11	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu
12	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu
13	Pekan Kota Belud	Complementing Nabalua Rafflesia	Kota Kinabalu
14	Kota Marudu	Complementing Nabalua Rafflesia	Tambatuon Homestead
15	Kota Marudu	Complementing Nabalua Rafflesia	Kota Kinabalu

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16	Kota Marudu	Cabana Retreat	Tambatuon Homestead
17	Tambatuon Homestead	Aura Raudhah Villange and Beach	Kota Kinabalu
18	Kota Marudu	Polumpung Completes Campsite View	Kota Kinabalu
19	Kota Marudu	Polumpung Completes Campsite View	Pekan Kota Belud
20	Kota Marudu	Polumpung Completes Campsite View	Tambatuon Homestead
21	Kota Marudu	Polumpung Completes Campsite View	Kota Kinabalu
22	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
23	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
24	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
25	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
26	Kota Kinabalu	Tambatuon Homestead	Kota Kinabalu
27	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
28	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
29	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
30	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
31	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
32	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
33	Kota Marudu	Tambatuon Homestead	Kota Kinabalu
34	Pekan Kota Belud	Tambatuon Homestead	Kota Kinabalu
35	Pekan Kota Belud	Tambatuon Homestead	Polumpung Completes Campsite View
36	Kota Marudu	Tambatuon Homestead	Kota Kinabalu



**Figure 5 and Figure 6:** Tourist Circuit Pattern Determined by Organization/Institution in Kundasang - Ranau and Kota Belud

For respondents' travel determined by organization or institution, there were significant differences for the two study locations. The majority of respondents who come to Kota Belud are to determine their journey through organizations or institutions. This is closely related to the findings of the study that the respondents who came to Kota Belud were mostly from the students.

### iii) Tourist Trip Determined Personally

The results showed that majority of respondents who came to Kundasang - Ranau and Kota Belud, Sabah were assigned privately. Individually determined tourist roaming spaces have more variety than tourist roaming spaces determined by travel agencies and organizations or institutions. This is because tourists who visit a destination alone are free to determine their journey. Based on Figure 7 and Figure 8, respondents who set up their trips privately are more likely to choose tourist destinations that are close to each other.

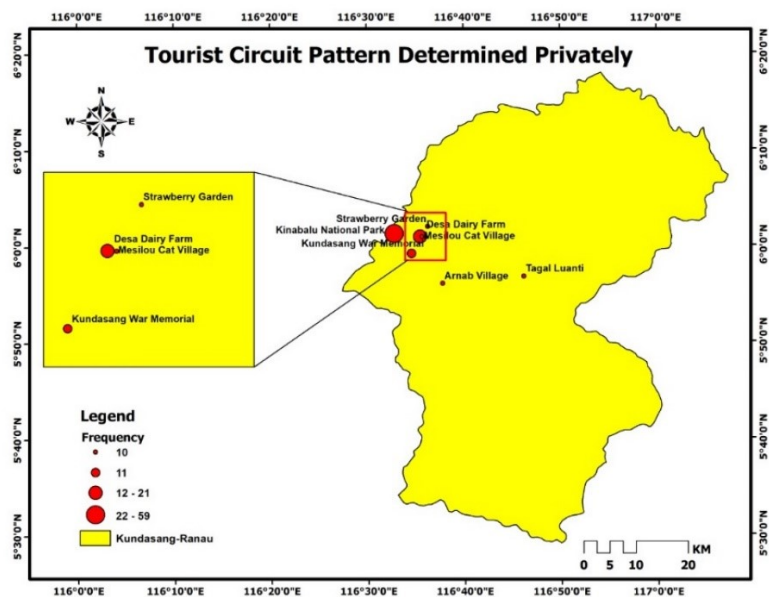


Figure 7: Tourist Circuit Pattern Determined Personally in Kundasang – Ranau

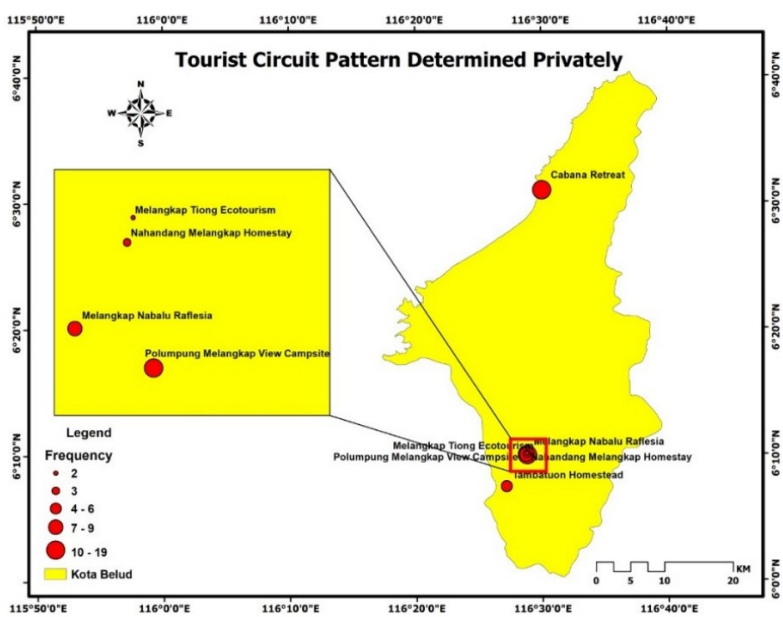


Figure 8: Tourist Circuit Pattern Determined Personally in Kota Belud

## CONCLUSION

Tourists' willingness to pay at tourist destinations is highly impacted by the pricing structure. Additionally, the WTP is influenced by tourism locations' attractions and services. Additionally, tourists consider additional criteria such as visiting a tourist destination for the first time, visiting a tourist destination that is contagious (viral) on social media, visiting spontaneously without a travel plan set by family or friends, and visiting a tourist destination set by an organization while attending workshops, courses, or the like. The research's primary finding is that there is an interaction between the tourist space and travel management to a location, whether through travel packages, handled by organizations and institutions, or privately managed.

## ACKNOWLEDGMENTS

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## **INCORPORATING ANN WITH PCR FOR PROGRESSIVE DEVELOPING OF AIR POLLUTION INDEX FORECAST**

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### **Abstract**

This study circumscribes the modelling for concentration of Air Pollutant Index (API) in Selangor, Malaysia. The five monitored environmental pollutant concentrations (O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>) for ten years (2006 to 2015) data are used in this study to develop the prediction of API. The selected study area is located in rapid urbanised areas and surrounded by a number of industries, and is highly influenced by congested traffic. The principal component regression (PCR) for the combination of the principal component analysis together with multiple regression analysis, and artificial neural network (ANN), are used to predict the API concentration level. An additional approach using a combination method of PCR and ANN are included into the study to improve the API accuracy of prediction. The resulting prediction models are consistent with the observed value. The prediction techniques of PCR, ANN, and a combination method of R<sup>2</sup> values are 0.931, 0.956, and 0.991 respectively. The combination method of PCR and ANN are detected to reduce the root mean square error (RMSE) of API concentration. In conclusion, different techniques were used in the combination method of API prediction which had improved and provided better accuracy rather than being dependent on the single prediction model.

**Keywords:** Air Pollutant Index concentration, principal component regression, artificial neural network, combine prediction model

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## **INTRODUCTION**

Today, developed and developing countries are unavoidable in fronting the issues regarding the ambient air quality. Biological, chemical and physical properties have become the main determination to the air quality status, which can be manifested through the air pollutant index (API). Precisely, the API is a numerical index which is measured based on the combination of selected air quality variables. This index is vital in assessing the differences in the sources of air quality (Hua, 2018; Azid et al, 201a). After the compliance has been decided, the statistical data can be beneficial by carefully warning the public regarding the health effects (Azid et al, 2014). When air pollutants have exceeded the normal condition of the ambient level of air quality status, this could bring chronic effects to human health (Moustris et al, 2010). Hence, air pollution required serious attention by authorities, especially in highly populated and manufacturing industries in the urban areas (Mutalib et al, 2013). In Malaysia, API is an indicator used by the government to monitor the air quality status since 1989 (Hua, 2018; Azid et al, 2014). By combining the five categories of sub-indexes of air pollutants such as ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), and particulate matters under 10 µm (PM<sub>10</sub>) (Mutalib et al, 2013) which provide the total value of API. The increment of one unit value of API will cause the air pollution level to increase by one unit and this circumstance will affect the human health greater. The level of air quality status has been monitored based on the Recommended Malaysian Air Quality Guidelines (RMAQG) since 1989 by the Department of Environment (DOE), Malaysia (Hua, 2018; Azid et al, 2014a; Mutalib et al, 2013).

For Malaysia to be a developed country by 2020 in the industrialised sectors, it is important to be linked with rapid economic growth. These circumstances cause degradation in urban environments through tremendous industrial pollution. Air pollution becomes a major issue in rapid economic growth which negatively affects human quality of living, agriculture, animals as well as the ecosystems (Azid et al, 2015; Mutalib et al, 2013). Simultaneously, non-living beings such as buildings, monuments, statues, etc., are suspected to be included in the damages list due to air pollution issues. According to past studies, the major air pollutant sources detected in Malaysia were derived from mobile, stationary, and trans-boundary pollution (Dominick et al, 2012; Jamal et al, 2004; Afroz et al, 2003; Awang et al, 2000). Specifically, mobile pollution can be referred to as motor vehicle emissions (Awang et al, 2000); while stationary pollution are referred to as the dust emitted from urban construction works and quarry, open burning, power plants, etc. (Dominick et al, 2012); and trans-boundary pollution originated from air pollution of forest burning or volcanic eruptions which were transported from neighbouring countries (Jamal et al, 2004). The major issues highlighted are involved with trans-boundary pollution

which occurred in Southeast Asian countries like Southern Thailand, Brunei, Singapore, as well as Malaysia, where these catastrophic events happened due to the open and uncontrolled burning of forest by farmers to clear the land for other activities (Torre, 2013). A greater impact of air pollution has increased when El-Nino phenomenon takes place to create extreme dry weather conditions (Queh, 2002); which has already been experienced by Malaysians in 1997 (Brauer and Hisham-Hashim, 1998). Therefore, frequent assessment and monitoring of the air quality data by the majority of the regions denoting the pollutant sources have increased with time which have inconsistently satisfied the national standard levels.

Air pollutant sources are uncontrollable major tasks globally. According to DOE Malaysia, the air quality is collected consistently which monitors the data daily to acknowledge the status as well as to inform the people about the pollutant concentrations at the exact time (Dragomir, 2010). The major source of air pollution which is suspected to occur in highly built-up areas, like urban and suburban areas, are O<sub>3</sub> and PM<sub>10</sub> (Hua, 2018; Azid et al, 2015; Azid et al, 2014; Mutalib et al, 2013), which are also suspected to become the main cause of deterioration on human health (Azid et al, 2014; Mutalib et al, 2013). Therefore, DOE Malaysia had provided important data regarding air pollution through various programmes such as using environmetric techniques, which are involved with cluster analysis (CA), discriminant analysis (DA), factor analysis (FA), and principal component analysis (PCA) (Hua, 2018; Hua, 2017; Hua et al, 2016; Azid et al, 2015; Azid et al, 2014; Mutalib et al, 2013). These techniques have the advantage in understanding the air quality status in the studied area by interpreting the complex databases, as well as benefits in the programmes for monitoring the air quality with efficient management. Nevertheless, the prediction on air quality had become a challenge when using a simple mathematical formula especially involved with complex data (Mutalib et al, 2013) which are incapable of relating the non-linear with the different variables (Afzali et al, 2012). Since the air quality exists in the stochastic time series and are able to be predicted based on the historical data (Giorgio and Piero, 1996), therefore, it is vital to help by reducing human health issues by planning and controlling strategies for proper actions.

To track and predict the air quality status, it is important to understand the methods used for modelling in this study. The aim for this paper is to select the explanatory variables by applying principal components before including it into the multiple regression analysis, and continue inserting it into the artificial neural network of the resulting residuals. Multivariate Linear Regression (MLR) analysis is considered as one of the methods which are widely used to express the dependence variable onto various independent variables. Nevertheless, these techniques seem to confront an issue when independent variables are correlated

between each other (McAdams et al, 2000). Due to the correlation occurring among the independent variable, which is also known as multicollinearity, which could hardly assist in providing accurate contributors of physical process in an equation. Therefore, the method to avoid multicollinearity and overlapping information of independent variables is by using the principal component analysis (PCA) of environmetric techniques. PCA is popular in identifying the variations of environmental pollution and investigating the factors that influence the quality concentration (Lengyel et al, 2004; Klaus et al, 2001). Simultaneously, PCA has the ability to resolve the issue regarding multicollinearity and examine the relationships within independent variables, which could react as predictors. An advantage from this technique in optimising spatial patterns as well as removing multicollinearity problems, is the newly provided variables as predictors by PCA which are considered ideal and appropriate for input into the regression equation (PCR) (Abdul-Wahab et al, 2005). The specific procedure for applied PCR regarding the pollution can be found elsewhere (Hua et al, 2018; Azid et al, 2014; Dominick et al, 2012).

The models of artificial neural networks (ANN) have the capability in handling the problems of multiple variables as well as determining the non-linear relationship involved with air quality index. Hence, ANNs is considered having flexibility, efficiency, and accuracy, to practice non-linear patterns between input and output values as well as defining the solution towards the complex data accurately (Rahman et al, 2013) including additional new data that was presented (Azid et al, 2015; Azid et al, 2014; Mutalib et al, 2013). This technique undergoes a training process or early experience to provide its own weight distribution for the linkage through learning procedure, which does not require an algorithm to determine the solution of the problem (Garcia et al, 2011). Therefore, past studies had proven that ANN have the potential in solving environmental problems, particularly involved with air quality pollution (Brunelli et al, 2007; Tecer, 2007; Perez and Reyes, 2006; Niska et al, 2005; 2004). To provide better performance, a combination of methods of prediction had been introduced since 1969 by Bates and Granger, whereby this technique includes bootstrapping, gagging, stacking and boosting, rather than being dependent only on the single prediction technique. A combination of methods suggested for use in this study is PCR and ANN, which were supported by past literature in various fields of studies that have the capability to increase the prediction performance (Chia et al, 2012; Noori et al, 2010; 2009). In general, the selected combination methods indicate a better performance than the possess individual prediction. Consequently, although there is a minor debate regarding the inconsistency of ANNs' performance (Khashei and Bijari, 2011) which are involved with a large number of factors such as network structure, training methods, as well as sample data (Chia et al, 2012;

Noori et al, 2010; 2009), these weaknesses can be overcome by getting involved with the idea of combination prediction methods.

As stated earlier, this study aims to predict the air quality status by using principal component regression (PCR) by including the techniques of principal components and multiple regression analysis. Apart from the prediction methods involved with PCR and ANN individually, a combination of both methods are also suggested in this study, not only to identify the concentration of pollutant sources, but also to investigate the relationship between air quality variables in the study area.

## MATERIALS AND METHODS

### Study Area

Eight (8) sampling stations have been set up for monitoring in the study area of Selangor state (Figure 1), with the geographical coordinate of latitude between 2°35'23.53"N to 3°47'55.09"N and longitude between 100°56'25.09"E to 101°57'58.50"E (Table 1). With approximately 8104 km<sup>2</sup> area, the Selangor state is placed in the western part of Peninsular Malaysia with the boundary between Perak in the north, Pahang in the east, as well as Negeri Sembilan in the south, and facing the seaside of the Straits of Malacca in the west. Specifically, selected sampling stations at different locations are due to highly built industrial areas, residential areas, and heavy traffic congestion in the study area. According to the DOE (2012) report, the Malaysia air quality status was considered between good to moderate levels for all the time being. Generally, majority of the studies reported that Malaysia's API is affected by particulate matter (PM<sub>10</sub>) (Awang et al, 2000) due to the PM<sub>10</sub> concentration which has exceeded the minimum good quality level and is unceasingly greater than the other pollutants (Othman et al, 2010). Although Malaysia is cleared from typhoon, volcanic eruptions, as well as earthquakes, which keeps maintaining the air quality status; however, high population and rapid economic growth have become the main factor to worsen the level of air quality and it's vital to conduct a prediction for early preparation by consistently assessing the data.

**Table 1:** The details of 8 monitoring stations in Selangor, Malaysia.

Station ID	Location	Latitude	Longitude
Station 1	Klang, Selangor	3°0'53.72"N	101°24'47.02"E
Station 2	Petaling Jaya, Selangor	3°7'59.37"N	101°36'28.53"E
Station 3	Shah Alam, Selangor	3°6'17.03"N	101°33'21.66"E
Station 4	Kuala Selangor, Selangor	3°19'16.13"N	101°15'22.61"E
Station 5	Putrajaya, Wilayah Persekutuan	2°54'52.49"N	101°41'23.69"E
Station 6	Cheras, Kuala Lumpur	3°6'22.62"N	101°43'5.00"E

Station 7	Batu Muda, Kuala Lumpur	3°12'45.08"N	101°40'56.47"E
Station 8	Banting, Selangor	2°48'59.98"N	101°37'23.21"E

### Data Collection and Data Treatment

The data of air pollutant sources include ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), and particulate matters under 10 µm (PM<sub>10</sub>) which provides the status of API which was employed by DOE Malaysia since 1989, and obtained from the department from January 01, 2006 to December 31, 2015. Teledyne Technologies Inc., USA and Met One Instrument Inc., USA, are the instruments used to monitor the data of air quality by DOE. Based on the Standard Operating Procedures for Continuous Air Quality Monitoring (2006), PM<sub>10</sub> was assessed using BAM-1020 Beta Attenuation Mass Monitor analyser from the apparatus of Met One Instrument Inc. USA. The equipment used in capturing the data is capable of detecting the high level of resolution of 0.1 µg m<sup>-3</sup> at a 16.7-L min<sup>-1</sup> flow rate, whereby the limit of detection for the lower levels are <4.8 µg m<sup>-3</sup> and <1.0 µg m<sup>-3</sup> for one (1) and twenty-four (24) h, respectively. Simultaneously, the other variables include a monitor using Teledyne Technologies Inc., USA, which are involved with Teledyne API Model 100A/100E, Teledyne API Model 200A/200E, Teledyne API Model 300A/300E, as well as Teledyne API Model 400A/400E to evaluate the NO<sub>2</sub>, SO<sub>2</sub>, CO and O<sub>3</sub>, respectively. The analyser used to detect the lowest level are at 0.4 ppb in SO<sub>2</sub>, NO<sub>2</sub>, and O<sub>3</sub> using UV fluorescence method, chemiluminescence method, as well as UV absorption (Beer-Lambert) method, respectively; while the CO can only be measured by using the infrared absorption (Beer-Lambert) method with the lowest level of detection at 0.4 ppm. All variables were tested at the precision level of 0.5%.

This study uses the statistical data of 960 dataset (12 data per stations x 8 stations x 10 years) and total number of 4800 dataset (12 data per stations x 8 stations x 10 years x 5 variables). The missing data for the overall data point is very small (approximately less than 5%). By using software SPSS Ver. 23, the nearest neighbour method was included to facilitate the data analysis (Hua, 2018; Azid et al, 2015). To be specific, the nearest neighbour method determines the distance between the two and the closest point, where the gaps of the end points are employed towards all missing values (Azid et al, 2014; Dominick et al, 2012). The equation is shown as Eq. 1;

$$y = y_1 \text{ if } x \leq x_1 + \left[\frac{x_2 - x_1}{2}\right] \text{ or } y = y_1 \text{ if } x > x_1 + \left[\frac{x_2 - x_1}{2}\right] \quad (1)$$

where,  $y$  refers to interpolant,  $x$  refers to interpolant's time point,  $y_1$  and  $x_1$  refer to coordinate of the gap for beginning points, and  $y_2$  and  $x_2$  refer to coordinate of the gap for endpoints.

### The Hybrid Approach of Methodology

Hybrid approach had been reported in previous literature, which indicated that although the linear model has successfully resulted in the data that exists in linear relationships, difficulties arise during the involvement with several variables, multicollinearity, as well as outliers. Meanwhile, ANN has the ability to model the data which are involved with non-linear variables. Hence, the alternative to improve the prediction performance is by the applied hybrid approach that has the capability to enhance by capturing the possibility of different patterns in the data especially involved with linear and non-linear empirical data (Noori et al, 2010; Al-Alawi et al, 2008). Consequently, this study uses a combination method to determine between the components for linear and non-linear as in Eq. 2;

$$y_1 = G_1 + N_1(2)$$

where,  $G_1$  is the component of the linear and  $N_1$  is the component of non-linear; whereby both components are evaluated by employing the subsequent techniques.

Firstly, the technique for principal component regression (PCR) is applied to calculate the component for linear data ( $G_1$ ) which is involved with the five (5) variables of air quality in order to predict the concentration of API. The procedures with specific information to employ PCR for prediction on the API are available to be obtained elsewhere in Hua (2018) and Azid et al (2014).

Secondly, the linear model that produced the residuals contain the non-linear relationship which can be explained further in Eq. 3;

$$e_t = y_t - G_t(3)$$

where,  $e_t$  refers to the model for PCR (linear model) of the residual at the time  $t$ ,  $y_t$  refers to the value which is observed at the time  $t$ , and  $G_t$  refers to the predict value for the time  $t$  which resulted from the PCR model (Abdul-Wahab et al, 2005).

Thirdly, to model the ANN can only be carried out based on the residuals resulted through the model of PCR which are included into Eq. 4;

$$e_t = f(e_{t-1}, e_{t-2}, \dots, e_{t-n}) + \varepsilon_1(4)$$

where,  $f$  refers to as the function for non-linear that are examined using a neural network, and  $\varepsilon_l$  can be referred to the error value of random. The prediction of API for the combination method between ANN and PCR can be expressed in Eq. 5;

$$\hat{y} = G_t + \hat{f}_1(5)$$

where,  $\hat{f}_1$  is referred to the value of ANN. Hence, in depth techniques used in the hybrid methods can be obtained from the studies of Al-Alawi (2008) and Zhang (2003); while the procedures to apply for the ANNs methods to predict API that originated from the studies are derived from Hua (2018) and Azid et al (2014).

## RESULT AND DISCUSSION

The outcome for the analysis of predicted API using different methods of PCR, ANN and the combination method can be expressed in Table 2. According to Figure 2, the result which indicated from the method analysis of PCR onto API concentration shows that the adjusted coefficient of variations ( $R^2$ ) is considered fairly satisfied at 0.931, whereby the concentration of API is under-estimated along the sampling stations. Nonetheless, the most significant notables are in sampling station 1 and sampling station 6. The air pollutant sources are suspected to originate from the shipping activities from Port Klang valley as well as motor vehicle emissions and construction works from highly built-up urban areas in the Kuala Lumpur district. Simultaneously, prediction on API concentration using the model of ANN shows a significant improvement to provide the  $R^2$  about 0.956 (Figure 3). On the same note, the results from ANN have an overestimate in sampling station 2, 3, 6 and 7; which highlighted that the air quality is associated with the urban pollution which includes the meteorological factor which affects the surrounding environment. For instance, wind directions are considered as one of the consequences of meteorological state to influence directly on the emission effect of the atmosphere to enhance the air pollution status. Lastly, applying the model of PCR into ANN resulting in residuals for an almost perfect fit of API concentrations with  $R^2$  are 0.991 (Figure 4). Therefore, applying the last model of the combination method and examining the residuals indicate that the results are almost normally distributed with approximately zero mean and non-multicollinearity issues on the correlation detected.



**Table 2:** The actual and predicted mean for API concentration using different prediction techniques.

Sampling Station	Mean			
	Actual API	Predicted API by PCR	Predicted API by ANN	Predicted API by combine method
1	10.90	8.05	10.8	10.85
2	8.43	7.99	9.71	8.38
3	8.88	8.55	9.62	8.67
4	8.37	7.76	7.26	8.41
5	7.44	6.75	7.82	7.07
6	8.51	6.11	9.76	8.48
7	5.73	4.8	6.25	5.65
8	5.50	4.28	4.87	5.55

RMSE or root mean square error plus correlation coefficients are used in this paper to determine a comparison between actual and predicted value in the models. Generally, RMSE can be expressed through Eq. 6;

$$RMSE = \sqrt{\frac{\sum (A_i - E_i)^2}{n}} \quad (6)$$

where,  $A_i$  is the API concentration for the actual value for every station, as well as  $E_i$  refers to each of the models used to estimate the concentration level. Table 3 shows the outcome of RMSEs for the total value of predicted API concentration based on the sampling stations for each model used in the study. The resulting errors for the range in model of PCR are 5.25 to 11.81, meanwhile the model of ANN error ranges between 3.89 to 4.16, as well as the combination method ranges between 2.97 to 4.73. In order to identify the ranks, it is suggested to use the Wilcoxon test, where the results indicated are between ANN and the combination models are not having any significant difference in statistical analysis (p-value = 0.257), yet, only the model of PCR has a significant difference for either of the two models used in the study (p-value < 0.01).

**Table 3:** The predicted API concentrations using RMSE for selected sampling stations of each model.

Sampling Station	RMSE of AQI		
	PCR method	ANN method	Combine method
1	5.25	3.10	3.48
2	6.58	3.33	3.65
3	7.49	3.62	4.05
4	11.81	4.16	4.11
5	7.70	3.51	3.78

6	5.78	2.89	2.97
7	6.26	3.05	3.06
8	10.65	3.68	4.73

Lastly, the logarithms predicted for the concentration of API for the three methods versus the logarithms of observed value are transformed into scatter plots, which are expressed in Figure 5 to Figure 7. The adequacy of the model can be determined through the clustered points that are close to the 45° tangent line. The scatter plot resulted from the regression line for PCR, ANN and the combination method are 0.865, 0.923, and 0.981 respectively. Although the slope for a perfect fit from the outcomes of the three models are not significantly different, PCR models with the value of  $R^2$  are considered the lowest among three with 0.838; continued by the ANN model with 0.887, as well as the combined model with 0.982. Hence, since the comparison performances for RMSE results of ANN and the combination method are almost similar, nevertheless, the combination method provides a better outcome than the ANN model. The main reason to enable the combination method to be chosen for better performance is because of the applied principal component which has the capability to indicate variables of predictor to clarify the API concentration level and the variation naturally. In other words, to be more specific, the selected through principal component method to provide the variables of predictor are  $O_3$  and  $PM_{10}$  which are considered as the main pollutant sources to affect the air quality level in majority of the sampling stations, while  $SO_2$  and CO are suspected to increase in certain sampling stations.

## CONCLUSION

This study illustrated that the prediction of API concentration is more accurate when using different methods to model by using PCR techniques to select the most appropriate variables to provide as explanatory variables before applying to the regression technique for model purposes. Simultaneously, the process has continued to input the resulted residuals into ANN technique for the combination method. In other words, the model of ANN used in the combination method has the ability to capture the undetected residuals of non-linearity in PCR to fit into the analysis. Despite the model of ANN have the capability to contribute a better fit compared to the model of PCR, nevertheless, the combination between ANN and PCR have proven to have a greater significant accuracy of prediction for API concentration level for the monitored sampling stations. Techniques involved with the root mean square error (RMSE) plus mean absolute percentage error (MAPE) are used in the study to substantially lower the prediction of the combination method, when compared to the individual method for prediction of

PCR or prediction of ANN. The modelling involved in this approach is significant and provides a better potential for other field of studies.

## DATA AVAILABILITY

The data used to support the findings of the study are available from the corresponding author upon request.

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## **RESIDENT'S WATER ACCESSIBILITY TOWARDS SUSTAINABILITY: THE CASE OF INFORMAL SETTLEMENTS OF JOS METROPOLIS, NIGERIA**

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### **Abstract**

This study is aimed at determining the type of relationship that exists among variables that affect informal residents access to water in the study area. A structured closed ended questionnaire was prepared and administered to a sample of 382 respondent's, mostly women and girls in five informal settlements of Jos Metropolis. Results from the study revealed that the  $\beta$  and  $p$  values of the predictors are as follows; cost and affordability ( $\beta=0.113$ ,  $p=0.014$ ), Intermittent water supply ( $\beta =0.045$ ,  $p -0.190$ , Physical distance ( $\beta=0.365$ ,  $p<0.001$ ) and lastly Queuing for water ( $\beta=0.151$ ,  $p=0.002$ ). Out of the four-hypothesis developed, cost and affordability, physical distance and queuing for water have a significant negative effect on resident's access to water. This study therefore contributes a significant gap in methodology by determining the relationship among variables, using PLS-SEM for regression analysis, which is entirely a different method from what was used in previous studies. Hence, presents the novelty of this study

**Keywords:** access to water, determinants, informal settlements, residents

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## **INTRODUCTION**

Informal settlements are trapped with a wide range of needs, problems and challenges, among which includes access to water. These settlements are known for having the most difficult water access (Adams & Halvorsen, 2014). They hardly have a steady water supply due to their unplanned nature (Narain et al., 2013; Nolan, 2015; UN Habitat, 2007). The first target of Sustainable Development Goal (SDG's) six is: 'Ensure availability and sustainable management of water and sanitation for all by 2030' (WHO/UNICEF, 2017). It therefore stresses the need of equal access to clean and affordable drinking water for all, while drawing emphasis to appropriately managed water sources and other sources (WHO/UNICEF, 2017). Oxford English Dictionary defines access as the right or chance to use or benefit from something, while Merriam-Webster defines it as the consent or right to make use of something (Merriam-Webster, 2017; Oxford Dictionary of English, 2017). A household is regarded to have access to better water supply if it has enough water for family use, in addition to other essential indications, and is not putting children and women to undue effort (UN Habitat, 2018). Nkemdirim et al. (2017) argue that access to safe drinking water can be assessed or defined by the number of persons who have a reasonable means of obtaining an acceptable amount of safe drinking water. Previous study revealed that in Jos Metropolis informal settlements, majority of the respondents have access to water sources that are improved, but not adequate enough to meet their daily requirements (Nanle & Abdul Latip submitted). Several studies however show that in water related issues, it is most paramount to determine the underlying factors that could be responsible for resident's poor access. Such studies have considered the socio-economic and physical factors through the application of various methods such as multivariate logistic regression, logistic regression, and multiple linear regression analysis that could affect resident's access to water (Isoke & Dijk 2014; Akoteyon 2019; Kong et al. 2020; Oyerinde & Jacobs, 2021). Additionally, previous studies in Jos Metropolis have paid little attention to this and virtually not considered relating residents' access to water in informal settlements to spatial and economic factors. A holistic approach to identifying the most significant factor that affects residents access to water in informal settlement is equally important. This study is therefore aimed at addressing a significant gap in the methodology by investigating the spatial and economic determinants that could negatively affect informal residents' access to water through the application of Partial Least Squares – Structural Equation Modelling (PLS-SEM), using Warp PLS software, which is entirely a different method from what was used in previous studies.

## **LITERATURE REVIEW (DETERMINANTS OF RESIDENTS ACCESS TO WATER)**

### **Cost and Affordability**

Difficulties in paying for water, or reduce spending on other household because of water is classified as problems of price or affordability (Subbaraman et al., 2015). Equally, cost is been considered as one of the factors that can influence a person's willingness to pay for a particular service (Kayser et al., 2013). Water tariffs influence household access to the consumption of drinking water (Akdin et al., 2012). In addition, high cost of water in informal settlements is not just limited to network supply but also the cost of buying from small scale water providers. Okotto et al. (2015), noted that for many slum residents, groundwater is a vital domestic source because it is affordability and availability. Therefore, cost and affordability are hypothesised as;

Ha 1: cost and affordability of water have a negative effect on residents' access to water in informal settlements.

Previous studies have however attested to the fact that cost is a crucial factor that can influence a person's willingness to pay for a particular service. Smiley (2016) opined that direct household water connection expenses are out of reach for poorest residents of Dar es Salaam, reasons been that household seeking new direct water connection would have to pay for the metre, pipes, and labour, as well as a connection charge and three months expected up-front consumption. Similarly, a study in Mumbai also shows the shortfall in water quantity due to affordability (Subbaraman et al., 2015). A study in two slum of Ghana reveals that residents Old Fadama claim that the amount is insufficient, owing to the high cost of water (Tutu & Stoler, 2016). In Mongolia, the situation of Ger areas is such that high water prices from water kiosks leads to under consumption (Karthé et al., 2015). Also, residents in Khartoum and Cairo's metropolitan mega-slums must pay high prices for water but yet water is not available for their daily needs (Islam & Susskind, 2015). In Dar es Salaam, small scale water providers charge 8 times the purchase price, water is therefore expensive, making it difficult for the poorest to acquire adequate supplies (McGranahan et al., 2006). Having these challenges in informal settlements will negatively affect water quantity, hence the basic requirement will hardly be met.

### **Intermittent Water Supply**

Intermittent Water Supply is another determinant of resident's access to water. The term 'intermittent' refers to a water supply that is unavailable for some period of time, and it ranges from predictable to unreliable, which tends to have serious implications for the water user (Galaiti et al., 2016). It usually occurs when the available water supply or the network's hydraulic capacity is insufficient to offer



a continuous supply (Martinez-santos, 2017). Intermittent water supply is hypothesised as:

Ha2: Intermittent water supply have a negative effect on resident's access to water in informal settlements

In Kampala, piped water is available to most inhabitants in peri-urban communities, but still experienced higher magnitude problems of intermittent supply (Nakawunde et al., 2010). In Phulbari slum settlement, it was discovered that despite the fact that taps were present, water was only supplied for a half hour every day, generally in the morning (Rashid, 2009). In Dar es Salaam. In areas where the poorest reside are seen dry pipes without water, the availability of water from most water sources are not reliable, the majority of homes do not have access to water on a daily basis, and they frequently face water scarcity, water can be unavailable for a complete a week's worth of 24-hour periods, in some cases households can get access to water each weekday but for no more than 24 hours at a time, while others may only get water once a week. In other instances, the nature of unreliability may not adhere to any predetermined delivery timetable (Smiley 2016). In the same way, rationing of water in Accra Ghana is common, at the network of eastern supplies, some localities receive supplies only once or twice a week, while others do not receive flows for several weeks (McGranahan et al., 2006). According to a recent study in Malawi, water delivery is erratic and intermittent in some informal settlements (Harawa et al., 2016). Also, informal water providers in Mumbai only give water once a week, hence more than one-fourth of families obtained water only once in the previous week, indicating a lack of reliability (Subbaraman et al., 2015).

### **Physical Distance**

The distance to a water source is a significant factor in determining the amount of water available for home consumption. Distance as it relates to water access is defined by the length of space from the residence of a person to the water source (Smiley 2016). The time required to go to the nearest water source in terms of distance is highly significant in informal settlements (Otieno, 2013). Literature reviewed shows that water collection sites may be distant (Crow & McPike, 2009). The distance between a water supply and a dwelling has a significant influence on the amount of water available for household. Physical distance is hypothesised as:

Ha3: Travelling long distances to fetch water have a negative effect on resident's water access in informal settlements

A research carried out in two major cities of Buea in South- West Region of Cameroon revealed that due to the popular demand of water and governments inability to meet the water demand, residents especially children and women have to travel to more distant locations to access water (Fonjong & Ngekwi, 2014). In Uganda, however, a significant variable is the distance between the water fetcher and the water source. Respondents revealed that the distance they walked to the nearest safe water source is less than one kilometre, sometimes one to two kilometres, and occasionally more than two kilometres (Naiga et al., 2017). Residents of Old Fadama walk between 3.1 and 6.7 kilometres (one-way) to nearby communities in search of water, whilst residents of Old Tulaku trek between 4.1 and 6 km (one-way) to other neighbourhoods (Tutu & Stoler, 2016).

### **Queuing and Long Waiting Time**

Fetching of water for household use at alternative sources devote a significant amount of time to each of the stages involved in water collection: time is taken to travel to the water collecting location, waiting for water at the source, transporting and storing the water. In contrast, households having direct access to water through on-site taps enjoy more favourable conditions, as water collection requires no effort (Dos Santos et al., 2017). In such cases, water fetching may also entail waiting in line for an extended period of time (Dagdeviren & Robertson, 2011). Smiley (2016) however argued that on paper all people are considered to have water access, but in reality, the undesirable water sources available to the people, coupled with waiting to fetch water on long queues is a pointer that water is not reliable and available because it is accessed in an unsustainable manner. The waiting time on the queue varies: it can be one, two hours or more depending on the number of containers the person in front has, approximately ten containers can be used by one person to get water, so you have to wait for everyone ahead of you in a line to finish collecting water before your turn arrives (Adams, 2017). Queuing for water is hypothesised as:

Ha4: Queuing to fetch water by residents has a negative effect on their water access in informal settlements.

Previous studies revealed that in informal settlements of Malawi, early in the morning women wake up and go to fetch water at the kiosk. However, they spend longer to get water due to long queues. Similarly, in a study carried out by Smiley (2016), findings showed that at a water kiosk, women are seen waiting for more than two hours to fetch water with as many as 100 empty water containers in a queue.

## **METHODOLOGY**

### **Sampling and Data Collection**

This research was conducted during the dry season, the peak of water scarcity in the study area. It was carried out between the months of January to March 2020 in five informal settlements: Kabong, Jenta Adamu, Mado, Sabon-Gari, and Angwan Rukuba. The choice of these settlements is informed by the nature of the topography, defined by mountain ranges and inselbergs. Due to the hilly terrain getting access to underground water is quite difficult. The simple random sampling technique was used. A structured questionnaire was developed using the variables and items reviewed, on a five-point Likert scale: strongly disagree, disagree, undecided, agree and strongly agree), the scale was designed and made available for respondents to choose, to see how strongly people agree or disagree with statements. From a sample frame of 72,597 people, the sample size was determined from the sample table produced by Krejcie & Morgan (1970). They are of the opinion that the table can be used to ascertain the appropriate sample size in a population that is finite, and no calculation is needed to use the table. A suitable sample size for the population is 382 people. Therefore, a total of 382 questionnaires were distributed at random to predominantly girls and women.

### **Data Analysis**

The data collected during the survey was captured in Ms Excel Statistical Package for Social Science (SPSS) version 23. The Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse a total of five variables and 21 indicators. These variables were analysed in Warp PLS 7.0 software, using the reflective model for multiple regression analysis.

## **RESULTS**

This section, which is the presentation of the results of the study, first is preceded by the assessment of the measurement model. The reflective measurement assessment is carried out to assess the indicators validity and reliability for: internal consistency reliability validity, reliability of indicator (outer loadings), validity of convergent, and lastly the discriminant validity (Ramayah et al., 2018). Secondly, the structural model was equally assessed for: lateral collinearity, significance of relevance of the structural model relationship, Level of  $R^2$  (Coefficient of Determination), Level of effect, and the Predictive Relevance ( $Q^2$ ). The results are presented as follows:

### Assessment of the Measurement Model

**Table 1:** Result of the internal consistency reliability, Indicator reliability and the convergent validity

Constructs	Items	Loadings	AVE	CR
Residents Access to Water	WAT1	0.785	0.592	0.744
	WAT2	0.952		
Cost & Affordability	COW1	0.741	0.517	0.703
	COW4	0.992		
	COW5	0.975		
Intermittent Water Supply	AOW3	0.898	0.581	0.801
	AOW4	0.876		
	AOW5	0.918		
Physical Distance	DOW1	0.779	0.530	0.818
	DOW3	0.873		
	DOW4	0.861		
	DOW5	0.794		
Queuing for Water	QFW1	0.887	0.577	0.803
	QFW3	0.920		
	QFW4	0.813		

In terms of the internal consistency reliability for exploratory research, the acceptance range for the composite reliability (CR) as opined by Ramayah et al. (2018), is values between 0.70 -0.90. The result of this analysis shows that the composite reliability for all the constructs fall within the recommended range, this is therefore suitable for the model. In terms of the outer loadings, loading value greater than or equal to 0.708 shows the latent variable can explain at least 50% of the variance in the indicator (Hair et al., 2017). The result from this analysis shows that all the outer loading values are greater than the recommended value. For the AVE values, each construct is expected to account for at least 50% of the assigned indicators variance (Hair et al., 2017), the result from the analysis have equally met this condition, with more than 50% of the assigned indicators variance (see table 1)

**Table 2:** Discriminant Validity using Fornell and Lacker Criterion

	Cost & Affordability	Intermittent water supply	Physical Distance	Queuing for Water	Residents Access to Water
Cost & Affordability	<b>0.719</b>				
Intermittent Water Supply	0.142	<b>0.762</b>			
Physical Distance	0.065	0.348	<b>0.728</b>		
Queuing for Water	0.007	0.240	0.352	<b>0.760</b>	
Residents Access to Water	0.072	0.167	0.412	0.277	<b>0.770</b>

Table 2 above shows that all the constructs have a satisfactory discriminant validity, this is because all the square root of AVE (diagonal) is larger than the values in the AVE (off diagonal).

### Assessment of the Structural Model

#### Lateral Collinearity

The result shows there is no collinearity problem (see table 3). The VIF values of all the latent constructs (cost and affordability, intermittent water supply, physical distance, queuing for water) are less than the recommended value of 5 (Hair et al., 2017). This therefore shows that the variables hypothesized do not measure the same construct (Ramayah et al., 2018).

**Table 3:** Collinearity Assessment

Construct	VIF
Cost & Affordability	1.034
Intermittent Water Supply	1.179
Physical Distance	1.409
Queuing for water	1.191

**Table 4:** Result of the Hypothesis Testing

Hypothesis	Relationship	Std Beta	p-value	Decision	R <sup>2</sup>	F <sup>2</sup>	Q <sup>2</sup>
H1	Cost &Affordability and Resident's access to water	0.113	0.014	Supported	0.232	0.013	0.240

H2	Intermittent Water Supply and Resident's access to water	0.045	0.190	Not supported		0.009	
H3	Distance travel to fetch water and Resident's access to water	0.365	<0.001	Supported		0.162	
H4	Queuing for water Resident's access to water	0.151	0.002	supported		0.047	

**Assessment of the Significance of Relevance of the Structural Model relationship**

Based on the assessment of the path coefficient three out of the four hypotheses are found to have p-values  $\leq 0.05$ . The predictors of cost and affordability ( $\beta=0.113, p=0.014$ ), Physical distance ( $\beta=0.365, p<0.001$ ) and lastly Queuing for water ( $\beta=0.151, p=0.002$ ) see Table 4. Thus, only three hypotheses; H1, H3 and H4 are supported.

**Assessment of the Level of R<sup>2</sup> (Coefficient of Determination)**

The R<sup>2</sup> value from this analysis suggests a substantial predictive accuracy. The R<sup>2</sup> is 0.23. Cohen (1988), is of the opinion that 0.26, 0.13 and 0.02 describes substantial, moderate and weak levels of predictive accuracy.

**Assessment of the Effect Size**

In respect to the effect size, the result shows that physical distance have a medium effect size in producing the R<sup>2</sup> residents' access to water with value 0.164 (see table 4). F<sup>2</sup> values of 0.35, 0.15 and 0.02 are considered large, medium and small effect sizes (Cohen, 1988), the result equally indicates that Queuing for water (0,047), Cost and affordability (0.013) and Intermittent water supply (0.009) have weak levels of predictive accuracy on the endogenous variable

**Assessment of the Predictive Relevance (Q<sup>2</sup>).**

In terms of the predictive relevance, the Q<sup>2</sup> value of the path model are often used to assess the model's predictive relevance. Q<sup>2</sup> values larger than 0, indicate that the exogeneous construct have a predictive relevance for the endogenous construct (Hair et al., 2017). The result obtained from this study shows that the Q<sup>2</sup> is 0.240 (see table 4), this is more than 0, thus the model has a sufficient predictive relevance.

## **DISCUSSION AND CONCLUSION**

The results of this study shows that the relationship between physical distance to water sources is highly significant (with a p-value < than 0.001). Similar research has revealed that physical distance has a significant relationship to water access in informal settlements (Fonjong & Ngekwi, 2014; Tutu & Stoler 2016; Naiga et al., 2017). Results on long waiting time on a queue also have a significant negative effect on resident's access to water in informal settlements (with a p value 0.002). This result agrees with other similar studies by Smiley (2016). Cost and affordability also have a significant negative effect on resident's water access. Similar research conducted have also shown that residents of informal settlements can have limited access to water, simply because of their low economic status (Akdin et al.,2012; Smiley 2016; Tutu & Stoler 2016). In contrast, intermittent water supply does not have a significant relationship to resident's access to water in informal settlements of Jos Metropolis. This constitutes a novelty of this research, and this affirms the fact that a study conducted in informal settlements of Jos Metropolis, shows that the residents get access to water mostly through the combination of several other sources (Nanle & Abdul Latip submitted). This can hence be interpreted to mean that though intermittent water supply is evident, residents can always get water to meet their daily needs from other sources available at other locations far away from their immediate vicinity at a reasonably high cost.

### **Contribution to Methodology**

This study has however made a significant contribution to methodology by using a different method to explore the relationship that exist between the dependent and independent variables through the application of Partial Least Squares – Structural Equation Modelling (PLS-SEM) in Warp PLS software which is entirely a different method from what was used in previous studies. The model it can equally be adopted and tested in other parts of Nigerian cities and sub-Saharan countries especially in informal settlements with similar characteristics in terms of topography and terrain.

### **Practical Implication**

There are equally practical implications associated with the research. Results obtained shows that physical distance to water sources is the most significant, followed by queuing for water and then cost and affordability. It is evident that spatial and economic factors play a crucial role in determining water access, the implication is that there will continuously be a decrease in water consumption and carriage due to long distance and queues. As the journey time and distance to the water source increases, there is a rapid decrease in water usage, while the availability of a nearby source provides a physical possibility to obtain additional water at a shorter time (Martinez-santos, 2017). In respect to the economic

implication, high cost of getting water from the various sources equally means that more money will be spend on water at the expense of other important needs. In addition, residents may not afford to purchase the required quantity of water due to affordability issues, hence limiting their access in terms of quantity, alongside its related health and sanitary implications. Hence, the need to develop and adopt policies and physical planning strategies that will ensure appropriate locations of water facilities, and affordable tariff to enable residents of informal settlements get adequate water access.

### **Limitations and Further Studies**

It is crucial to highlight however, that this study is not void of limitations. The results of this study like any other research have limitations which can be relevant for future scholars to carry out further studies. Firstly, this study covers only few informal settlements within the core areas of Jos Metropolis, further investigation is needed to ascertain the situation of informal settlements at the periphery. In addition, there is equally limitation in the timing of the study. The field work was conducted during dry season, there is therefore a need to verify the situation during rainy season. Secondly, physical distance and queuing for water have significant negative effect on resident's access to water, further studies is needed to confirm the actual location of these public pipes through the use of modern technologies that will provide more accurate estimates of the distances covered by residents to water sources.

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## **ECOTOURISM ACTIVITIES, HOMESTAY RECOVERY PLAN AND STRATEGY INDICATORS IN POST COVID-19 KUNDASANG, SABAH, MALAYSIA**

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### **Abstract**

The purpose of this article is to discuss strategies and recovery plans for community-based ecotourism and homestays following the Covid-19 pandemic Movement Control Order (MCO), particularly in Kampung Mesilou, Kundasang, Sabah. The spread of the Covid-19 virus has had a significant impact, particularly on the tourism industry in Malaysia and, more specifically, on the ecotourism sector in the state of Sabah. The implementation of MCO in Malaysia, which aims to restrict population movement, has had a negative impact on the tourism sector, as all of them were ordered to halt operations completely. As a result, the question of the strategies and recovery plans implemented by ecotourism and homestay operators to restore the ecotourism sector, particularly in Kampung Mesilou, arises. Therefore, the main research approach in this study is qualitative and based on primary data. The primary data used were the results of in-field informant interviews, which were supplemented by secondary data from journal articles. The study's findings revealed that after the government announced the relaxation of the MCO, the communities in the area took the initiative to re-promote their ecotourism activities widely through social media, etc. One of the entrepreneurs' strategies for attracting tourists in their shorter and medium plans is the addition of new ecotourism products and the improvement of the quality of homestay facilities recently.

**Keywords:** Recovery Plan and Strategy, Movement Control Order (MCO), Covid-19 Pandemic, Ecotourism, Homestay

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## **INTRODUCTION**

In the earlier phase, the spread of the Covid-19 epidemic, which has received worldwide attention, has made this a major issue on social media. Every day, the number of cases reported by the Malaysian Ministry of Health (KKM) causes public concern in the community. The spot in Malaysia detected the spread of this epidemic in January 2020. At this phase, however, the Malaysian government allowed the economy to continue operating normally. Because of the global spread of this epidemic, the World Health Organization (WHO) has classified it as a pandemic, which is defined as the spread of a new disease throughout the world (WHO, 2022). The spread of this pandemic appears to be difficult for any country around the world to contain because it has spread across borders so quickly.

Then, in Malaysia, the spread of the covid-19 pandemic compelled the government to impose the first phase of the Movement Control Order (MCO) for 14 days beginning on 18th March 2020 and ending 31st March 2020. However, this 14-day MCO period is insufficient to control the spread of the pandemic (Daily News, 2021). The implementation of this MCO is intended to encourage people to stay at home in order to break the chain of the covid-19 pandemic. All sectors, including tourism, have been closed as a result of this implementation until a date to be announced by the government. Nonetheless, the MCO will be implemented in stages until the government decides to issue a Movement Control Order (MCO) from 10 June to 31 August 2020. Through this PKPP, the tourism sector will benefit from the Malaysian Homestay Experience Program, under which the government has issued instructions requiring operators to prepare protocols in homestay premises that cover disease surveillance and prevention of infectious diseases in accordance with the Malaysian Government Ministry standards. Certain activities are not permitted by the government. Activities involving mass gathering and physical contact are among them, as are lodging rooms in the homestay owner's house, sports, and recreational activities in the swimming pool, and buffet-style restaurants and cafes (Arts and Culture Sector, 2020).

The government's efforts have paid off, as the MCO has been declared throughout Malaysia. The number of reported cases is also decreasing. Meanwhile, economic recovery is required because tourism activities have suffered significant losses (Kroll et.al, 1990). This recovery must be carried out on a small or large scale in order to re-stimulate the country's economic growth. In general, if a community-generating activity is discontinued, overall socioeconomic-cultural movement is constrained. The community cannot enjoy the same level of comfort as before. Post-covid-19 tourism activities must be restored or renewed in order to attract tourists to Kundasang, Sabah. Tourism recovery can be complementary to maintaining jobs, intelligence, and economic

well-being (Anas, Hussin & Afrizal, 2018). Therefore, the effects of disasters, how emergency planning can mitigate disaster effects, and how to restore the industry after a disaster occur must be taken into serious consideration (Ahmad Rasmi Al-Battat & Ahmad Puan Mat Som, 2014).

Although Malaysia's government's MCO produced results, it still has a significant impact on the national economy, particularly the tourism sector, which plays an important role in increasing national income. Thus, the tourism sector requires a post-covid-19 study of indicator plans and strategies to restore tourism activities in the country.

## **RESEARCH LOCATION**

Kundasang region is a tourist destination that attracts both domestic and international visitors to Sabah. It has hilly terrain and could be used as a tourist attraction. The Kundasang region has several unique characteristics in terms of function and location on the Sabah geographical scale (Ramzah Dambul, 2010). Tourist attractions include Rabbit Village, Mesilou Cats Village, and Strawberry Farm. Furthermore, Kundasang, which is about 1.5 kilometers from Pekan Ranau, is also known as "Vegetable Town," where the primary economic source of the Kundasang community is the cultivation of upland vegetables. This is due to the relatively cold weather in comparison to other parts of Sabah.

Besides the cold climate in the Mount Kinabalu area, especially in the morning, Kundasang's attraction can be also based on the uniqueness of the flora and fauna, and its friendly local community is the Dusun ethnic group. The community's friendly treatment encourages tourists to return to Kundasang. Although there are numerous reasons for tourists to visit, natural resources remain the primary focus of visitors.

## **RESEARCH METHOD**

The research methodology employed in this study is a qualitative approach based on primary and secondary data. The plan and strategy indicators in Kundasang were discovered using a qualitative approach. The qualitative approach is more comprehensive, explaining and interpreting the data obtained in greater depth (Sarah, 2013). A qualitative approach based on in-depth interviews is broad, open, unstructured, and not necessarily fixed (Kamarul Azmi Jasmi, 2012). An interview is a method of data collection that involves face-to-face interaction. In the meantime, secondary data from written sources such as scholarly books, journal articles, and newspapers are widely used as references, comparisons, and expressions to strengthen views and interpretations of the subject under study (Mohd Yusuf Ibrahim, 1997). The government-enforced Movement Control Order (MCO) in all Malaysian states has played an important role in slowing the

spread of the pandemic Covid 19 virus where all economic sectors, including tourism, have had to temporarily halt operations. Therefore, the fieldwork for data collection of this study was implemented during the post-Covid 19 MCO phases in December 2021 and beyond.

## **MAIN CONCEPTS DEFINITION**

### **Ecotourism Activity**

According to Zhao and Jiao (2019), ecotourism is an activity that can accommodate many tourists in a specific area that is exposed to the environment. This ability can thus not only meet the needs of tourists but can also benefit the tourism industry and serve as a form of awareness for tourists as members of the community to protect the environment together. This situation will also reduce the negative environmental effects because the ecotourism system is an indicator of the carrying capacity of the environment that was built based on calculations based on the main principles of this system (Zhao & Jiao, 2019).

Following that, the findings of the study conducted by Liu and Li (2020) stated that ecotourism activities are a type of management that is actively developing in order to successfully involve various parties. According to Access (2019), the concept of ecotourism is generally an influence of modernization and globalization that transparently impacts the shift of social and cultural values, resulting in slow changes in identity and cultural authenticity in a concentrated area. Ecotourism is also regarded as one of the most critical tools for achieving sustainability (Salman & Mohamad, 2020).

Syafiqah & Rosazman (2021) stated that the involvement of rural communities in ecotourism activities is the primary factor for the development of rural tourism. Community involvement in ecotourism activities is viewed as a highly effective alternative, particularly in terms of economic activity and new job creation. According to them, the participation of community members has demonstrated a role that is seen as one of the motivating factors. (Syafiqah & Rosazman, 2021). This is supported by Cole's (1995) study, which explains that community members' involvement has several internal factors that can be used in development programs. Among them are raising awareness of the benefits of ecotourism activities as well as the community's social needs.

Furthermore, Norazlin et al (2020) stated that the involvement of the local community through promotion and activities carried out in ecotourism activities can stimulate the arrival of many tourists to the destination area. Tourist packages such as caterers, homestays, and camping activities, climbing, and word-of-mouth promotion or social media can all help to attract many visitors. Thus, one of the initiatives to advance the ecotourism industry is community involvement (Norazlin, 2020).

### **Recovery Plan for Homestay**

The homestay program in Malaysia is regarded as the greatest means to convey a Malay or indigenous heritage culture, particularly the way of life in a cosy, quiet village apart from congested roads, loud neighbours, and polluted air. Tourists want to know about interesting places that are nearby, therefore attractiveness to the environment also plays a significant role. However, the success of a homestay is largely dependent on the neighbourhood's quality. This is seen as the leadership and skill that the rural tourist industry possesses. How can homestay management be carried out successfully without high-quality training and education unless the rural tourism community already has the necessary skills to handle the homestay organisation on its own? (Tengku Noraisyah Binti Tengku Zahar, 2013).

According to studies on the success of the homestay programme in Kampung Relau, Kedah (Che Ani Mad, 2004), both the program's special participants and the local population gain from it. This study benefits both the participants specifically and the larger community in general. The results of this study are also summarised, showing that the local community has benefited in five ways: economically, conveniently, economically, by developing a spirit of cooperation among neighbours, and by enhancing their capacity for personal growth.

### **Strategic Indicators**

A good strategic indicator should be clear and concise. It should focus on a single issue that provides relevant information on a situation; particularly information that provides the strategic insight required for effective planning and sound decision-making. Good indicators are also defined by the feasibility of collecting meaningful and credible data for them. In addition, good indicators should actually – and accurately – measure what they claim to measure. If it is not feasible to collect data for an indicator, or the data that can be collected are not meaningful, the indicator will have little or no utility (David Pencheon, 2010).

Many studies have been conducted on various themes related to environmental and socioeconomic indicators, such as urban form, urban climate, air pollution, environmental study, urban growth, urban forest, and urban infrastructure. It is difficult to capture the alternative approach to understanding the relationship between the environment and socioeconomic indicators (Chrysoulakis et al., 2014). Each city has unique socioeconomic and physical characteristics and conditions that should be reflected in scientific analysis and climate policy formulation (Lee & Painter, 2015). As a result, governing parties such as local experts, local governments, and policymakers should work with local communities to understand the challenges and solutions to specific climatic problems.



Indicators are long-term, proxy, or indexes that are used to understand, quantify, and report on the effects of changes in a specific event or set of circumstances (Kenney et al., 2012). Furthermore, this is a size that has been assigned to several people to solve a problem that cannot be solved with a single size or procedure (Keeney & Gregory, 2005). In other words, indicators derived from research conducted in Kg. Mesilou and used for improvement analysis based on space and requirements are closely related. In addition, to predict the future, indicators must be relevant to the surrounding environment, as well as the need to identify potential hazards (Illyani Ibrahim, Azizan Abu Samah, & M. Zainora Asmawi, 2017).

### **Post-pandemic Covid-19**

The SARS-CoV-2 virus is the infectious disease that is causing the global spread of the Coronavirus disease (COVID-19), according to the World Health Organization (WHO). The COVID-19 outbreak was deemed a public health emergency of worldwide concern by the WHO on January 30, 2020. The possibility for the virus to spread to nations with less developed healthcare systems, which will be less equipped to contain the outbreak, is WHO's a top concern (East et al., 2019). The largest infectious illness outbreak to ever affect Malaysia is the COVID-19 pandemic. The Malaysian government has implemented the Movement Control Order (MCO) for all communities to stop the spread of COVID-19.

The rate of infection has dropped as a result of the government's efforts to lower the rate of Covid-19 infections, including the MCO and the distribution of vaccines to the public in this nation. It can be claimed that the nation is currently moving toward an endemic phase, which is the period following COVID-19. Malaysia is finally moving towards a post-pandemic Covid-19 direction where all sectors carry out strategies and steps to restore the country's economy, social system, and politics after two years of dealing with the COVID-19 pandemic, which has claimed many lives and affected the country's economic sector (Hmetro, 2022). Through the Ministry of Finance and the Economic Action Council (MTE), several prompt actions were taken to address economic difficulties right away. The National Security Council (MKN) is crucial in striking a balance between life and life. Standard operating procedures (SOP) must be followed, according to MKN. The cabinet meets once a week to monitor or decides on every significant related issue in the post-pandemic Covid-19 phases (BHarian, 2021). Therefore, during the post-pandemic Covid-19 phase, the ecotourism activities, and homestay programme in Kundasang, Sabah started to welcome domestic and international visitors cheerfully.

## RESULT AND DISCUSSION

The data collection findings indicate that several areas need to be improved in order to revitalise the ecotourism and homestay sectors in Kampung Mesilou, Kundasang, Sabah. Improvements to infrastructure, amenities, the addition of ecotourism-related products, and media promotion are the four primary elements that the local community and other stakeholders must put into action. The four main components will then be further divided into sub-items and evaluated using the ratio of the primary field informants' responses.

### Profile of the main informants

To gather information about the recovery plan and strategy to revive tourism in the area, a total of 10 informants were questioned. Because they were picked based on their position in the Kampung Mesilou tourism organisation and village organisation, the informant pool was narrowed down.

**Table 1: Main Informants Profile**

Informants	Gender	Age	Role
1	Male	42	Head of Village
2	Male	38	MPKK
3	Male	24	Maragang Hill Secretary
4	Male	38	Maragang Hill (Publicity and Multimedia Manager)
5	Male	53	Homestay Owner
6	Male	55	Homestay Owner
7	Male	46	Homestay Owner
8	Male	48	Homestay Owner
9	Women	64	Homestay Owner
10	Women	56	Homestay Owner

**Table 2: Infrastructure Indicators, Recovery Plan and Strategy**

Indicator Item and Strategy	Sub-Item	Ratio Indicator (Answer By 10 Main Informants through In-depth-Interview)
Improving Infrastructure	Improving Road	<b>8:10</b>
	Water Pipe Installation	<b>5:10</b>
	Water Filtration Plant	<b>5:10</b>
	Clean Water Supply	<b>6:10</b>

According to Table 2 above, the primary recovery plan in the effort to revive the ecotourism and homestay activities in Kampung Mesilou in the post-pandemic Covid-19 period involves infrastructure amenities. Interviews with 10

main informants indicated that improving infrastructures such as roads (7:10) and clean water supply (6:10) are better strategies to increase tourist arrival in Mesilou village.

### **Improving Roads**

To make it simpler for road users, especially visitors who travel to tourist regions, improving roads is a comprehensive step. This is so that traffic congestion, which is frequently one of the primary issues when tourists are crowded in Kampung Mesilou, can be solved by the requirement for an efficient route. Eight of the ten informants who were interviewed agreed that Kampung Mesilou's roads needed to be repaired in order to better serve both tourists and locals.

*For the village, because of the road congestion here, this is one of the challenges right now, we can't deny it right now. If it's just the weekend, it's a nightmare, and if I'm on my own, I have my own opinion, and one of the issues is the road. Because the road has a lot of damage here and there, even the car wants to run over and can't because when he sees a pothole, he stops and that's it.*

*(Informant 1, Head of Village, 42)*

*The road from Mesilou village to Kundasang town can get very crowded at peak times, especially during school holidays. The traffic congestion can last for hours at times. So, if you see a long line of cars on the hill, avoid going to town.*

*(Informant 2, MPKK,38; 4 November 2021)*

Additionally, the villages had to utilise their own initiative to find a solution, which included building alternate roads to promote ecotourism activities and reduce users' time. For the convenience of all road users, community members also did repair damaged roads themselves.

### **Improving the Clean Water Supply**

A clean water supply is a crucial amenity for the locals, especially for those who run ecotourism operations and homestays because this is a fundamental amenity for the comfort of visiting tourists. But Mesilou village continues to rely on the gravity water pipe system until today (hill water). The improvement of the

village's clean water supply is one of the major recovery plans and strategies in the effort to rebuild the ecotourism business in the area.

One of the actions taken by the government to assist the people of Mesilou village is to provide a new allocation of RM7000-8000 for the village's gravity pipe improvement project. Among the upgrades is the replacement of a leaking water pipe with a new one. Meanwhile, a committee responsible for repairing the gravity water system in the event of damage has been formed at the village level.

*For use with pipes clean water supply. For example, if it has broken down, it is the committee members who work tirelessly to recover the situation.*

*(Informant 2, MPKK, 38; 4 November 2021)*

### **Provide a Water Filtration and Storage Facility**

The next plan and strategy for the recovery are to provide a filtration plant. There are 5 out of 10 informants agreed that a filtration plant should be provided, and 7 out of 10 informants agreed that a storage tank for clean water supply should be provided. Therefore, the water department has constructed a large filtration plant capable of serving not only Kampung Mesilou but also the entire Kundasang and Ranau. The informant claims that all pipelines that have been installed throughout the Kundasang are as follows.

*After all, a large water plant is currently being built in Ranau by the government, which is in the final phase and wants to be ready soon. Kundasang has seen the installation of all pipelines. There already is. So, whoever creates the new homestay will hopefully have to wait for that.*

*(Informant 1, Head of Village, 42; 4 November 2021)*

### **Improving Tourist Facilities**

**Table 3:** Tourist's Facilities Indicator, Recovery Plan, and Strategy

<b>Item</b>	<b>Sub-Item</b>	<b>Ratio Indicator (Answer By 10 Main Informants through In-depth-Interview)</b>
Improving Tourist Facilities	Parking Area	<b>6:10</b>
	Signboard	<b>5:10</b>

Ample facilities are critical for facilitating tourist demand, and movement. This is especially important for homestay entrepreneurs. This is since the arrival of tourists during peak times is extremely crowded, and the parking area in Kampung Mesilou is extremely limited. The village entertainment bureau stated that the systematic provision of signs is very helpful for visitors who are unfamiliar with the village. Six informants believe that having a large parking area is important, while five informants believe that signboards should be improved to make it easier for visitors to come to Mesilou village area.

In general, a parking lot serves as a facility that supports the ecotourism activities and movement of an area. This issue can be clearly seen in Kampung Mesilou during school holidays or weekends when the lack of parking becomes a serious issue. Therefore, the addition of the parking area is a very good initiative, especially in the effort to restore the ecotourism activities in the village. In addition, the provision of good and systematic parking facilities is one of the measures to control traffic congestion.

*These tourists can sometimes make things difficult. Commonly, there one person is in the car at the same time and the car could accommodate four people conveniently. Thus, parking is an issue whenever the tourist will park their car somewhere he or she prefers to ensure they are not walking far away from the tourist spot later.*

*(Informant 9, Homestay Owner, 64; 6 November 2021)*

### **Enhancing the Number of Signboards**

One of the initiatives or strategies to restore and improve ecotourism activities around Mesilau Village is the improvement of signage. As mentioned by one of the village Entertainment Bureau Committee stated that the village organisation is working to establish a village entertainment guide and facility.

*Most of the signs here are damaged, so they all need to be replaced, particularly the homestay signboard. Because tourists sometimes have difficulty searching the homestay where they stay.*

*(Informant 8, Homestay Owner, 48; 6 November 2021)*

However, signboards cannot be installed at will; homestay operators who want to put up signboards must first apply for permission from the

Entertainment Bureau Committee. In addition, the village entertainment bureau will create a frame or plan on which large-sized signs with all homestay names and road directions will be placed.

*But we can't just put up a sign advertising our homestay because we need permission from the Entertainment Bureau Committee. This is the person in charge of keeping track of the cheerfulness in the village.*

*(Informant 6, Homestay Owner, 55; 6 November 2021)*

**Table 4:** Eco-tourism Products as Indicator Strategies

Item	Sub-Item	Ratio Answer By 10 Main Informant
Ecotourism Products	Arnab Village	<b>7:10</b>
	Cat Village	<b>6:10</b>
	Mesilou Strawberry Farm	<b>6:10</b>
	Mesilou 3Sixty Peak	<b>7:10</b>

According to table 4, Arnab Village and Mesilou 3sixty Peak are two of the main draws for tourists visiting Mesilou Village, which is one of the new ecotourism products. According to 7 out of 10 respondents in interviews, the new ecotourism attractions are Arnab Village and Mesilou 3sixty Peak.

### **Expanding Ecotourism Products**

The Mesilou Volunteer Club Association (MAVOC) has mentioned that one of the recovery plans and strategies in the village is to increase ecotourism activities or products. Following the end of the Movement Control Order (MCO) pandemic Covid-19, efforts were made to restore the monthly income of homestay and ecotourism operators. Strawberry Farm, Cat Village, Rabbit Village, and other tourist attractions are popular with visitors in Mesilou. The MAVOC Secretary stated that:

*: So, this is an idea from Mr. Amrin, the coordinator of Mesilou Atamis Homestay, for us to create more tourist spots or even places that can be visited in Kampung Mesilou because he was challenged by the Minister to create more places or tourist products in Kampung Mesilou. Because in order to attract foreign visitors, we must provide something of value.*

*(Informant 3, Secretary, 24; 7 November 2021)*

The Mesilou Volunteer Club Association's (MAVOC) newly introduced tourism product is the 360 Peak (Wheel Swing 360), which has a height of 32 feet and an attractive 360-degree surrounding view. As a result, the government has been asked to assist the community in promoting homestays and new tourism products, particularly 360 Peak.

*One exists. So far, it has not yet been opened, which is also affiliated with MAVOC and is known as 360 Peak. He usually contributes to the presence of tourists in the village because he lives there.*

*(Informant 1, Head of Village, 42; 4 November 2021)*

#### **Promotion Through the use of mass media and social media**

Promotion is a strategy for increasing tourist arrivals in Kampung Mesilou, particularly for homestay and ecotourism operators. According to table 5, mass media promotion via Facebook is the most popular, with 9 out of 10 respondents agreeing with the indicator.

**Table 5:** Promotion Strategies as Indicator Strategies

<b>Item</b>	<b>Sub-Item</b>	<b>Ratio Answer By 10 Main Informant</b>
Mass Media Promotion	Facebook	<b>9:10</b>
	WhatsApp	<b>6:10</b>
	Instagram	<b>4:10</b>
	YouTube	<b>7:10</b>

The main strategy of homestay and ecotourism operators in Mesilou village is to promote themselves on Facebook, Whatsapp, Instagram, and YouTube. This is because, when the government announced that the Movement Control Order would be lifted and the country's borders would be opened to international tourists, all entrepreneurs actively promoted their establishments.

*...to me, I promote myself on the web, Facebook, and YouTube. I started a YouTube channel and uploaded content about hiking in Maragang Hill. That is how I promote Maragang Hill to outsiders.*

*(Informant 4, Maragang Hill (Publicity and Multimedia), 38; 6 November 2021)*

Furthermore, there is contact with travel agents, and there is a form of collaboration between homestay operators and travel agents who bring tourists to Kampung Mesilou. Furthermore, homestay operators provide tourists with a phone number to contact other homestay operators if the homestay they contact is full. The Homestay Association in Kampung Mesilou is also seeking government assistance in promoting new tourism so that it is known to all tourists who wish to visit.

## **CONCLUSION**

The above discussion has indicated that there are many ways to advance the ecotourism sector through social innovation. The main social innovation was introduced by the local community in Kundasang included enhancing basic infrastructure such as maintaining public roads and clean water supply, and enhancement of new ecotourism products such as hill trekking and introducing 360 Peak (Wheel Swing 360). To plan social innovation efforts sustainably require precise obligations and commitments from all parties and need to be carried out wisely. The result of this study demonstrated that with the recovery of Community Based Ecotourism, it is hoped that the national and state tourism industry of Sabah will continue to grow in terms of sustainability locally and globally.

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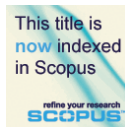
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## **GEOLOGICAL, GEOARCHAEOLOGICAL, BIOLOGICAL, AND HISTORICAL HERITAGE OF LENGGONG GEOPARK DEVELOPMENT**

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### **Abstract**

The Lenggong Valley is uniquely significant in national and international geological heritage and was declared a UNESCO Archaeological Heritage Site in 2012. The Lenggong Valley was formed 550 million years ago. It is one of the oldest in Peninsular Malaysia, equivalent to the rock formations in Langkawi and Jerai. The geological evolution in the Lenggong Valley also produced biodiversity and the history of early human prehistoric to the present time. Due to this privilege, the Lenggong Geopark nomination development effort started in 2020 by forming the Geopark Promotion and Development Committee. Lenggong Geopark covers an area of 2,068 km<sup>2</sup> (enclosed by the boundaries of the Lenggong Parliament). A total of 27 geosites have been identified, depicting four important geological and historical tectonic evolutions and special geomorphic features in the Lenggong Valley. Eight biosites are still preserved, involving granite mountain, limestone, and lowland ecosystems covered by different forest types. It is the limestone hills that contain a large number of rare and endemic flora species. In addition, eight geoarchaeological sites were also identified that depicts the interaction between early humans and the geological landscape. The unique and preserved traditions of life, art and culture have added value to the geopark. Therefore, active efforts continue to be carried out in the development of geosites and programs with the local community to foster a high sense of pride and belonging to a place, in addition to an understanding of the preservation and conservation of natural and cultural heritage in Lenggong Geopark. Various activities based on tourism activities are also planned to stimulate the economy and introduce Lenggong as the second national geopark area in the State of Perak.

**Keywords:** Geosite, biosite, geoarchaeological, geotourism, local community, sustainability

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## **INTRODUCTION**

Lenggong Geopark, which is located in Hulu Perak district in Perak, has a unique geological, biological, archaeological and cultural heritage. Its geological history begins since the Cambrian period, closely related to stratigraphic, tectonic, igneous and morphological evolutions (JKPPLG, 2021). Evidence of the history of geological evolution is still abundantly exposed in Lenggong and has a heritage of national and regional value. Therefore, this region is suitable for developing a geopark.

In line with the recommendation from the National Geopark Committee in 2020 to create the second geopark in the state of Perak, Lenggong Valley was chosen. Geopark is a vision of Regional Sustainable Development (PLW) that focuses on sustainable and integrated development between natural heritage conservation, improving the well-being and socioeconomics of local communities, and generating national wealth through the geotourism industry (Zuoros, 2016; Komoo & Patzak, 2018; Komoo, 2019; UNESCO, 2020; UNESCO, 2020a; Mohd Zulhafiz Said *et al.*, 2021).

Lenggong Valley has a high heritage value, especially from the geoarchaeological aspect and biological and cultural diversity, which has yet to be fully explored for the benefit of the tourism industry and the socioeconomic development of the local community. Lenggong was declared a UNESCO World Heritage Site in 2012 and involved an area of around 22 square kilometres. It is currently managed by the National Heritage Department under the National Heritage Act 2005.

## **LENGGONG GEOPARK DEVELOPMENT**

Lenggong Geopark development efforts began in 2020 with the formation of the Lenggong Geopark Promotion and Development Committee (JKPPLG). The committee members are the Center for Global Archaeological Research (CGAR), Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM) and the Department of Minerals and Geosciences (JMG) Perak. JKPPLG is assisted by the Lenggong Geopark Scientific and Development Committee (JKSPLG) for research, conservation and geosite characterisation, as well as the preparation of Lenggong Geopark development documents (JKPPLG, 2021).

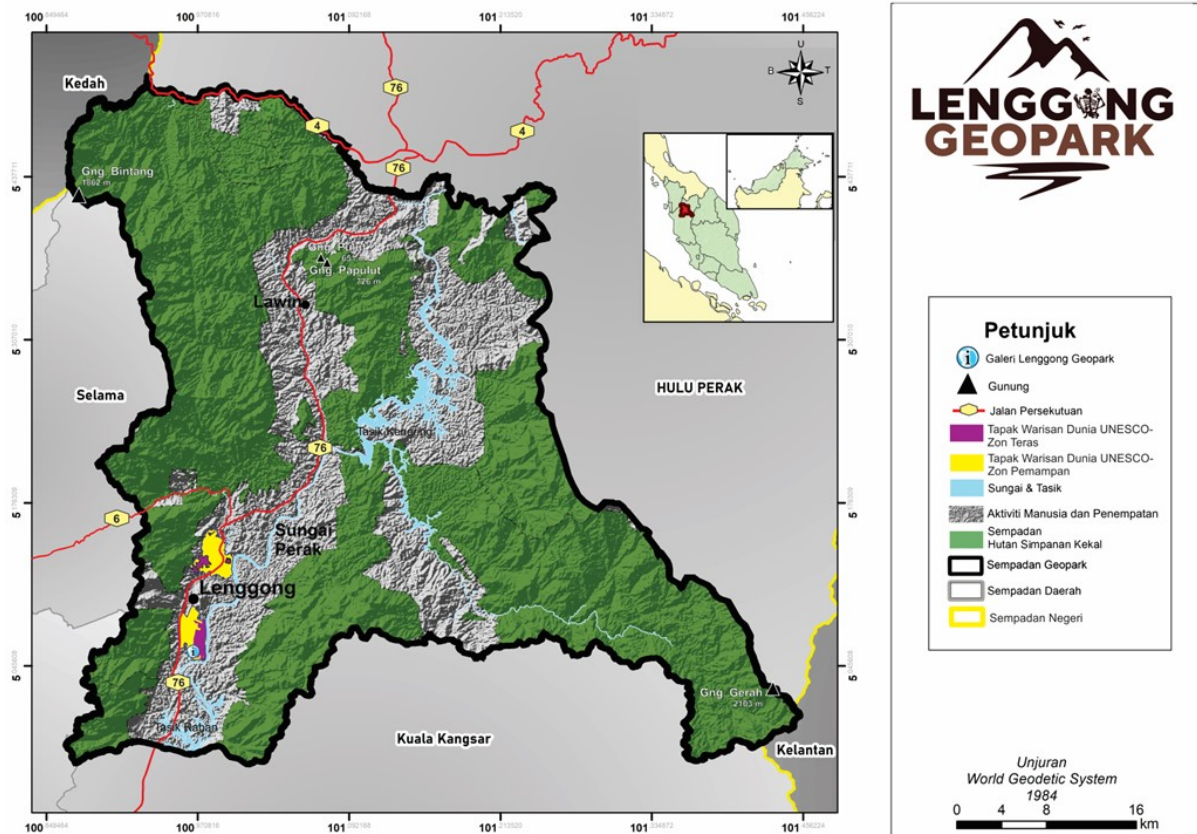


Figure 1: Lenggong Geopark boundaries

Through JKSPGLG, preparation towards building a geopark is conducted in order to develop the geosites. Some of these efforts include conducting fieldwork to identify the geological and cultural heritage sites, presenting proposal papers to the Perak State government authorities, preparing nomination documents (dossiers), producing information panels, and carrying out promotional activities to all stakeholders and residents of Lenggong such as organising seminars, briefings, exhibitions and even managing the evaluation mission of Lenggong Geopark.

Lenggong Geopark is located in four sub-districts, namely Durian Pipit, Temelong, Lenggong and Kenering sub-districts, with an area of around 2,068 square kilometres, including the boundaries of the Lenggong Parliament. The selection of Lenggong Geopark boundaries is based on all sub-districts within the Lenggong Parliament (P.055) and the ability of the Lenggong District Council to take responsibility for the development, management, and administration. This

selection also facilitates the support system and financial assistance for infrastructure development.

Geoparks can promote natural and cultural heritage resources through integrated development, geotourism development, preservation of heritage sites and empowerment of local communities (Komoo *et al.*, 2019; Mohd Zulhafiz Said *et al.*, 2021). By fostering a sense of community among the local community, it could indirectly preserve and conserve natural treasures, as well as celebrate and harmonise innovative tourism activities at Lenggong Geopark. The four main factors that underpin the empowerment of Lenggong Geopark are geological heritage, biological heritage, geoarchaeological heritage and cultural heritage.

### **Geological Heritage Lenggong Geopark**

Lenggong Geopark is a unique area with the relationship of rock types, minerals, structures, landscapes and unique geological features due to geological processes that occurred since about 550 million years ago. This area is located along a narrow valley bounded by the Titiwangsa Range in the east and the Bintang Range in the west. Based on technostratigraphy, Lenggong is part of the tectonic belt in the West Belt. This strip is part of the Sibumasu Block, west of the Bentong-Raub suture. This block was exhumed from the Gondwana continent at the end of the Early Permian during the opening of the Meso-Tethys Ocean (Metcalf 2011a, 2011b, 2013). The bedrock in the Western Belt is dominated by clastic and carbonate sedimentary rocks that represent the sedimentary sequence of the Gondwana continental margin since the Lower Paleozoic to the Permian.

The geological evolution of Lenggong describes the age relationship with geological processes and the resulting geodiversity. This evolution can be divided into four main phases: stratigraphic, tectonic, igneous, and morphological.

### **Evolution of Stratigraphic Geology**

The first deposition of sediments during the Cambrian period in the vicinity of shallow seas produced a group of sandy clastic sedimentary rocks. This rock, known as Papulut Formation, represents the oldest rock in Hulu Perak and Lenggong Geopark, equivalent to Machinchang Formation and Jerai Formation found in Langkawi and Gunung Jerai in Kedah. Next, the deposition of sedimentary rocks in the deeper sea environment resulted in a mixture of Ordovician to Carboniferous age rocks (490–300 million years) from the Kroh Formation and Kubang Pasu Formation rocks.

The Cambrian rocks are conformably overlain by a succession of Ordovician to Carboniferous rocks consisting of clastic and carbonate sedimentary rocks. The clastic rock units are Ordovician-Silurian (490-419 Ma)

from the Kroh Formation, Devonian (419-359 Ma) from the Lenggong Limestone and Carboniferous (359-300 Ma) from the Kubang Pasu Formation exposed in contact with the granite of the Titiwangsa Range. The Kroh Formation rocks are composed of shale, shale phyllite and limestone. Next, the deposition of limestone sediments continued until the Devonian period (419-359 Ma) by the Lenggong Limestone Formation. Deposit by the Kubang Pasu Formation in the Carboniferous (359-300 Ma) is characterised by interlayered rocks of dark grey sandstone and shale.

Rocks from the Kubang Pasu Formation were deposited in the vicinity of the shallow Tethys Ocean during the Carboniferous age (359–300 million years) before the entire area was uplifted by the Triassic age granite thrusts and formed the land. The last phase of terrestrial sediment deposition occurred, filling small inland basins formed by faults during the Neogene period. The Neogene sedimentary rocks are exposed in several localities in Lawin, known as the Lawin Basin. All of these rocks were then overlain by terrestrial sediments in the form of colluvium, river and beach alluvium of the Quaternary age.

### **Tectonic & Igneous Geological Evolution**

Large-scale volcanic activity had occurred based on the existence of several volcanic facies found in the northern part of Lenggong. The oldest detected volcanic activity is 480-460 million years old (Long 2018). Tectonic activity in the Permian age (300-255 million years) in the Southeast Asian region caused the collision between the Sibumasu Block and the East Malaya Block. Most of the sedimentary bedrock in Lenggong Geopark has undergone regional metamorphism due to very high pressure and temperature, resulting in various grades of rock ranging from phyllite and slate to high grade. This event may co-occur with the rock folding phase in the northwest and northern parts, known as the Langkawi folding phase by Koopmans (1965).

Next, there was a large-scale invasion of granite to form the Titiwangsa Range and the Bintang Range in the Triassic age (255-210 million years), which caused the lifting of the entire Peninsular Malaysia into the land. During the stratification of granite, the rocks in contact with it have turned into thermal metamorphism rocks. Limestone has changed to marble, while the clastic rock facies has changed to hornfels, phyllite and quartzite. The stratification of granite bodies had also caused regionally metamorphosed rocks before that to undergo further metamorphism into schists or higher grades. The last phase of sediment deposition occurred in the land's vicinity after uplifting due to granitic intrusion. This tectonic event and granite succession became an important geological history for Malaysia and Southeast Asia.

### **Morphological/Landscape Geological Evolution**

When Malaysia became land, the humid tropical climate caused high weathering and erosion processes, continuously carving and producing a variety of beautiful landscapes at this time, such as limestone karst, sedimentary rock lowlands and domes and granite ridges. During the Neogene (23.3–2 million years), there were several depositions of young terrestrial sediments, and one of them was at Lawin.

In the Quaternary age, the Perak River changed course, causing erosion and sedimentation processes along its course, now producing a series of river sedimentation terraces that form the Lenggong Basin located between the Bintang and Titiwangsa Ranges. The limestone landscape of the Lenggong Formation creates a mature karst topography with many caves. Most of these caves have been prehistoric human settlements and important archaeological sites, while rock material from river terrace deposits was used as stone tools.

The most important and last geological event in Lenggong occurred in 1.83 million years, which was the impact of a body from outer space (meteorite) that produced a crater with a diameter of 8 km with an impact reflection hill in the middle of the crater. This impact has also created the youngest type of new rock known as Bukit Bunuh Unit, which consists of impactite rock (suevite). The mega eruption of Toba volcano in Sumatra 74,000 years ago has affected most life on earth. Evidence of this eruption can be found in the Lenggong area, in the form of piles of volcanic dust over 6 m thick. Much of it has been eroded and the best site to see evidence of this is at Bukit Sapi, where the thickness of Toba dust reaches 6 m. In 1928, a hydroelectric dam was built in Chenderoh, Sungai Perak, in the southern part of Lenggong Geopark. In 1983 another hydroelectric dam was completed in the central region, the Kenering Dam.

The construction of these two dams changed the landscape of the Lenggong basin by creating two large artificial lakes (65.2 km<sup>2</sup>). Tasik Chenderoh, or Tasik Raban, has become a mature lake habitat resembling a natural lake. The geological landscape translated from the events that took place over 550 million years ago is not only evidence of the history of the formation of the earth but also produces a variety of rocks and terrain as the basic building blocks for the variety of geology and habitats. In Lenggong, among the habitats that can be found are lowland habitats, karst habitats, sandstone habitats and granite mountain habitats. At the same time, the geological landscape is also responsible for providing a suitable environment for prehistoric human life.

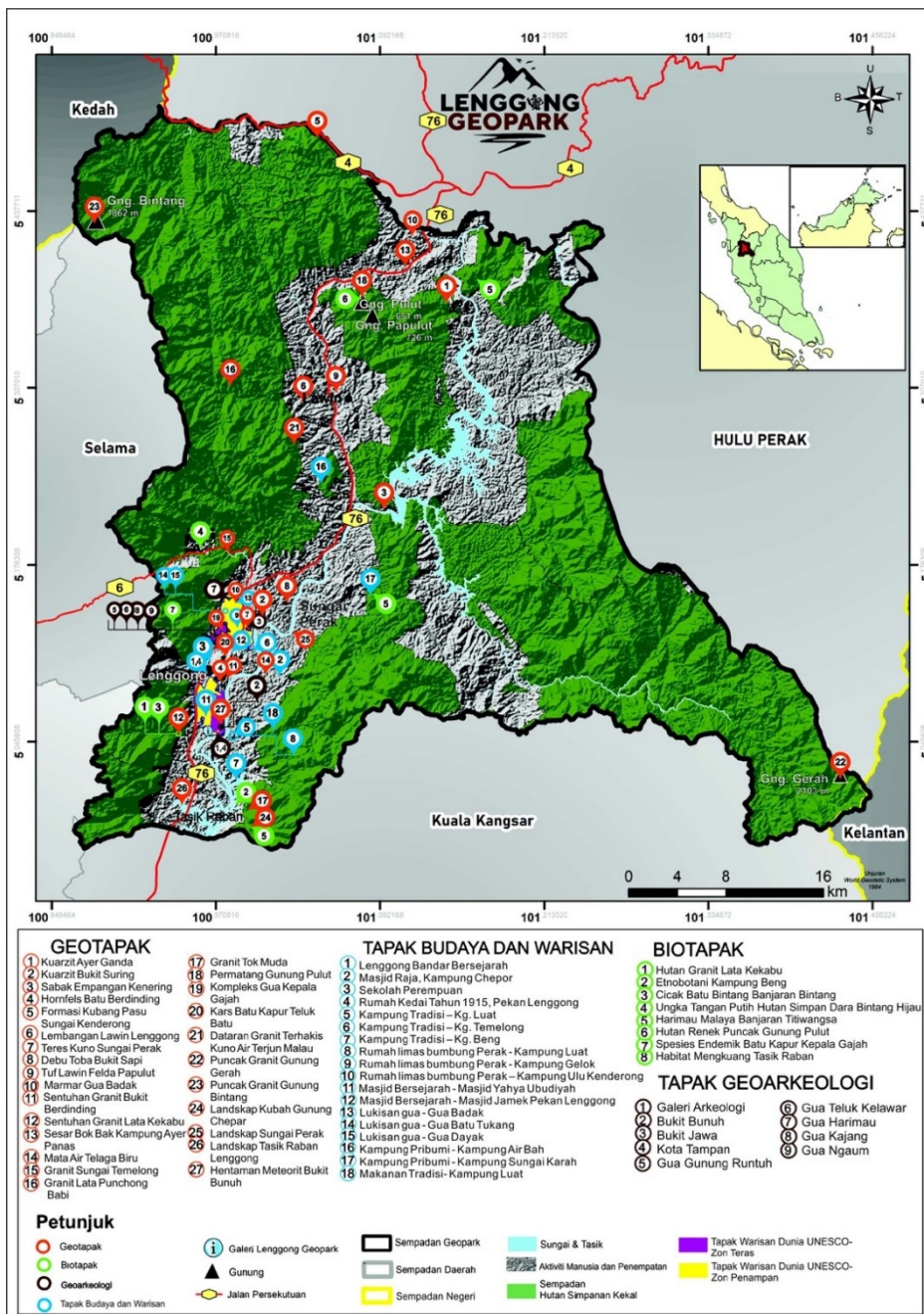


Figure 2: Lengong Geopark Map and Distribution of Geosite, Biosite and Cultural Site



All this field evidence supporting geological evolution over such a long period is a valuable geological heritage that must be preserved well to understand the homeland's history, which is the pride of all its communities.

### **Lenggong Geopark Geosite**

For the development of Lenggong Geopark, the evidence of the geological process is classified according to age and processed from old to young as a geological heritage site for Lenggong Geopark, as listed in Table 1. From 550 million years ago to today, the geological process has left evidence as a backup and can be studied further. Examples of the main geosites in Lenggong Geopark are as depicted in Figures 3 and 4.

**Table 1:** List and Explanation of 27 Lenggong Geopark Geological Heritage Sites

<b>Nos.</b>	<b>Evolution</b>	<b>Geosite</b>
1		Ayer Ganda quartzite
2		Bukit Suring quartzite
3		Kenering Dam slate
4	Sediment/ Stratigraphy	Batu Berdinding hornfels
5		Kubang Pasu Sungai Kenderong formation
6		Lawin Lenggong basin
7		Sungai Perak ancient terrace
8		Toba ash in Bukit Sapi
9		Lawin Felda Papulut tuff
10		Gua Badak marble
11		Bukit Berdinding granite contact
12		Lata Kekabu granite contact
13	Tectonic	Bok Bak Kampung Ayer Panas fault
14		Telaga Biru spring
15		Sungai Temelong granite
16		Lata Punchong Babi granite
17		Tok Muda granite
18		Gunung Pulut ridge
19		Gua Kepala Gajah complex
20		Teluk Batu limestone karst
21		Ancient eroded granite plain of Air Terjun Malau
22	Morphology	Granite peak of Gunung Gerak
23		Granite peak of Gunung Bintang
24		Kubah Hunung Chepar lanscape
25		Sungai Perak lanscape
26		Tasik Raban Lenggong lanscape
27		Bukit Bunuh meteorite impact

*Source: JKPLG, 2021*



Figure 3: Bukit Berdinding granite contact



Figure 4: Bukit Bunuh meteorite impact

### Biological Heritage

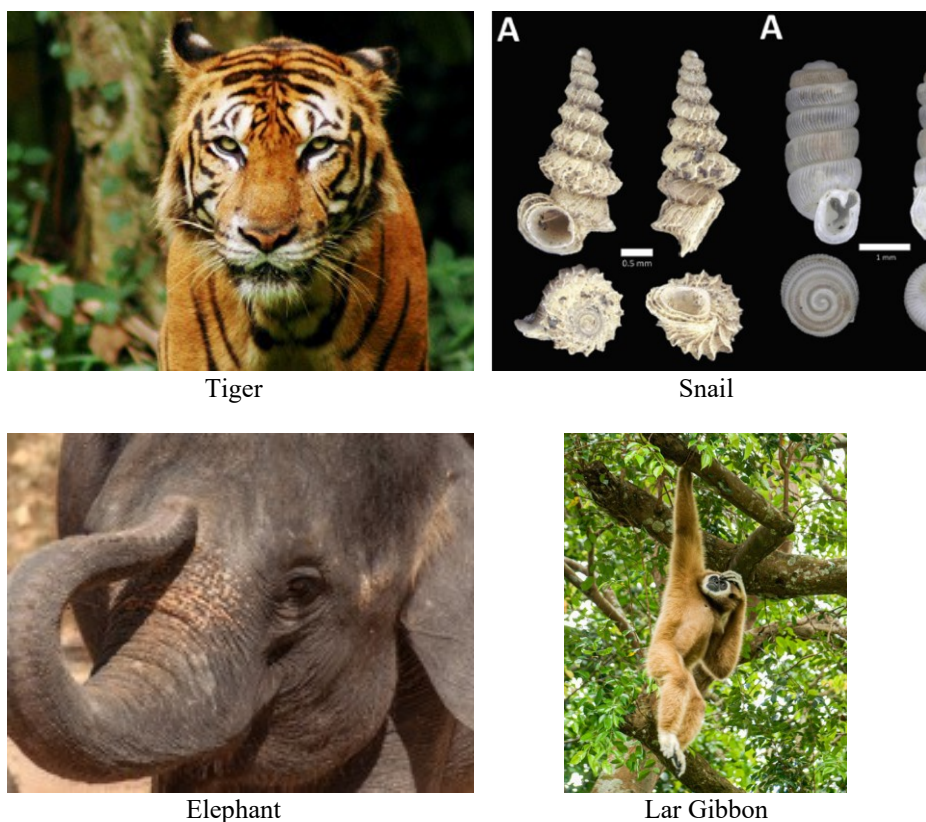
The coverage of the forest reserve in Lenggong Geopark is 1,402.8 km<sup>2</sup>, and the percentage of protected forest area is 31.5%, while 66.2% is a conservation forest for logging based on the Selective Management System (SMS). The main forest types included in Lenggong Geopark are mixed lowland and hill dipterocarp forests, limestone forests and mountain forests. The distribution of these different types of forest depends on the type of soil, which is the most important factor because of the relationship with geology (type of rock) and topography (such as the steepness of cliffs and flat land) (Main & Fatimah, 2011; Fatimah *et al.*, 2013).

The vegetation in Lenggong consists of limestone forest, lowland dipterocarp forest, hill dipterocarp forest, mountain forest, orchard area and secondary forest (Mohammad Saiful Mansor, 2012). Each limestone hill is estimated to have 200–300 species of flora, and each hill has a different combination of species. It is the limestone hills that contain a large number of rare and endemic flora species. Limestone vegetation is most threatened due to the exploitation of limestone resources for commercial use. That is why the limestone hills are identified as an Environmentally Sensitive Area (ESA).

Lenggong is a locality with five species of rare limestone flora and deserves to be designated as an Important Vegetation Area (IPA). The lower-level mountain forest covers the Bintang Range and the Titiwangsa Range. The forest here is characterised by medium-tall and emergent trees, especially the Dipterocarpaceae family. Among the rare mountain, animals are the desert goat and the mountain goat (*Polyplectron inopinatum*). Bovidae is the only wild goat in Malaysia (sub-Family Caprinae) among the endemic fauna (JKPPLG, 2021).

Chenderoh Lake is the oldest man-made lake, built in 1928, formed from the construction of Chenderoh Hydroelectric Dam. The area of the water reservoir is 25 km<sup>2</sup>. Aquatic vegetation on the banks of the lake is dominated by

*mengkuang* (*Pandanus helicopus*), the type commonly used to make woven baskets, mats and so on. Raban Lake, included in the Chenderoh Lake area, is popular among anglers because it is rich in freshwater fish (S.N. Ismail *et al.*, 2019).



**Figure 5:** Iconic Species in the Lenggong Geopark

Among the iconic species in Lenggong Valley as seen in Figure 5 are Malayan tigers; snails (*Sinoenaea lenggonegensis* and *Diplommatina lenggonegensis*), lar gibbons (*Hylobates lar*), and Asian elephant (*Elephas maximus*) (JKPPLG, 2021).

### **Geoarchaeological Heritage**

Geoarchaeological heritage is the legacy of evidence of early human discovery closely related to the use of geological resources. From the geoarchaeological aspect, the Lenggong Valley is very special and has now been declared a

UNESCO World Heritage Site on July 2, 2012. The declaration as a UNESCO World Heritage Site is based on: (i) the region being inhabited continuously from time to time throughout prehistoric times (Palaeolithic, Neolithic and Metal Age) from more than 1.83 million to around 1,000 years ago, (ii) the region has many Palaeolithic stone tool manufacturing sites that are still *in-situ* that successfully reveal the Palaeolithic technology, (iii) the region has some of the earliest evidence of Palaeolithic culture outside of Africa which dates back to more than 1.83 million years ago (Figure 6), and (iv) the discovery of the Palaeolithic human skeleton Perak Man, which is the only prehistoric human skeleton in the world that was found to have the genetic disease Brachymesophalangia Type A2 (Figure 7).



**Figure 6:** Palaeolithic stone tools such as this hand-held axe embedded in suevite rocks as evidence of the earliest Palaeolithic culture over 1.83 million years ago, which also suggests the existence of an ancient Perak River clerical enclave at that time.



**Figure 7:** The Prehistoric Perak Man skeleton found in Gua Gunung Runtuh, Lenggong.

Almost all evidence of this ancient civilisation is closely related to geological sources. The Lenggong Valley UNESCO World Heritage Site consists of two clusters, i.e. Cluster 1 is related to Bukit Bunuh meteorite impact evidence and ancient Perak River gravel deposits in Kota Tampan, while Cluster 2 is closely related to limestone cave formations and ancient Perak River gravel deposits in Bukit Jawa.

## **THE POTENTIAL OF NEW INNOVATIVE GEOTOURISM**

Lenggong Valley was recognised as a UNESCO World Heritage Site based on geoarchaeological heritage in 2012. Since then, several basic programs and facilities for heritage conservation and tourism activities have been introduced. A large part of the Lenggong community has become familiar with and involved in successful heritage conservation and heritage-based tourism activities. Lenggong also has high-value geological heritage resources (geosite) that have not yet been recognised and utilised.

The Lenggong community, through the Promotion and Development Committee, agreed that the Lenggong region should also be developed as a national geopark. This vision not only encourages integrated heritage conservation efforts but can develop heritage resources sustainably through geotourism. It can also encourage new tourism activities such as geotourism, geotrail and knowledge tourism. While geotourism pays attention to nature exploration, learning natural science, respecting nature and promoting sustainable tourism practices as well as an integrated relationship between nature and humans (Komoo *et al.*, 2018; Komoo, 2019); Mohd Zulhafiz Said *et al.*, 2021). The construction of a potential geotrail aims to reveal to tourists the uniqueness of the landscape with a beautiful view, as well as records of the history of the earth and life, such as fossils preserved in the rocks (Komoo *et al.*, 2018) are being explored.

Geotourism is an innovative tourism product that involves heritage components in geosites, especially those closely related to geological, archaeological, biological, and cultural heritage. Several geo-pioneers were introduced as new tourism products in Perak as a development program with the concept of education and recreation. There are 15 main packages divided into geo-initiating within geosites (7) and geo-initiating connecting several geosites (8).

Most Lenggong residents are still marginalised from the current development and have low incomes. Geopark development can increase job opportunities and the socioeconomic status of the local community. Lenggong Geopark can maintain the natural environment in its original state and reduce the threat of damage to heritage resources and the environment.

## **CONCLUSION**

Lenggong Geopark celebrates local natural, archaeological, and cultural heritage resources through integrated development involving heritage resource tourism, i.e., geotourism, archaeotourism, integrated heritage site conservation and socioeconomic development for the local community's well-being. The recognition of Lenggong Valley as a geopark will raise the name of Hulu Perak and Lenggong and attract tourists fond of geotourism, archaeology and

ecotourism activities. The development of geotourism will open up more business space and employment opportunities for the local community. This situation will help improve the socioeconomic status and well-being of the local community.

As a tourist area, infrastructure development will also grow rapidly, which will have more impact on the physical development of Lenggong Valley. With the geopark concept, the public education process that wants to ensure that people always love the natural environment will be achieved and assisted by a joint management approach for the conservation of integrated heritage and the use of natural resources without destruction in addition to developing a spirit of love for the region and a sense of belonging which economic development is more felt by the local community making Lenggong successfully prove and succeed in the concept and practice of Regional Sustainable Development. A large part of the Lenggong community has been recognised and involved in successful heritage conservation and heritage-based tourism activities because the Lenggong Valley was recognised as a UNESCO World Heritage Site based on geoarchaeological heritage in 2012. At the same time, they are fostering a sense of pride among the local people and strengthening their identity with the area, as well as stimulating new sources of income through geotourism while protecting geological, biological, archaeological and cultural resources in the region (Komoo & Patzak, 2008; Komoo, 2010).

Lenggong Geopark can maintain the natural environment in its original state and reduce the threat of damage to heritage resources and the environment. This vision not only encourages integrated heritage conservation efforts but can develop heritage resources sustainably through geotourism. Geopark development can increase job opportunities and the socioeconomic status of the local community.

## **ACKNOWLEDGEMENTS**

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## **MARAGANG HILL TREKKING THROUGH COMMUNITY-BASED ECOTOURISM (CBE): THE TOURIST GUIDES RESPONSIBILITY AND CHALLENGES IN KUNDASANG, SABAH, MALAYSIA**

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### **Abstract**

The issue of this article is tourist guides' responsibility and the challenges they face when conducting Maragang Hill trekking activities through community-based ecotourism (CBE) in Kundasang, Sabah. This study used mixed data collection methods: in-depth interviews with eight informants and observations around Mesilou village and at Maragang hill. The survey was also conducted on 63 community members in Maragang Hill as a supporting method to obtain more accurate data. Secondary sources refer to reinforce the study data. The concepts used in this study are interrelated to the topic and to understand the issue deeply. The results of this study have shown that although tourist guides did their responsibility perfectly (such as providing additional information to the tourists, a safety briefing, giving information about flora and fauna to the tourists, and hiking rules), some of the challenges remain for them. This study indicates the challenges tourist guides face while conducting Maragang Hill trekking activities through community-based ecotourism. This study enhances the concept of CBE in studies related to ecotourism activities, especially ecotourism based on nature. In so doing, the result of this study reduces the challenges faced by tourist guides or CBE management while conducting Maragang Hill-related activities soon.

**Keywords:** Community Based Ecotourism, Tourist Guides, Responsibility, Challenges, Local Community

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## **INTRODUCTION**

In Malaysia, the sub-tourism sector is under the service, which is seen to contribute the third largest to the Gross Domestic Product (GDP) after the manufacturing and construction sectors (Norlida, 2011). Both tourism and Ecotourism provided 2 million jobs in 2010 (Norlida, 2011). According to Sabah Tourism Board (STB) statistics from January to December 2019, Sabah recorded 4,195,903 total tourists, with an estimated receipt of RM9.0 billion. Malaysia's tourism industry, especially in Sabah, is gaining popularity and high profits. It brings benefits to the country due to the influx of foreign tourists. This has made the tourism sector one of the country's main sectors in future development. However, although tourism brought development, it also brought impact through the overuse and exploitation of tourism destinations (Normah et al., 2021). For example, Kinabalu Park (Normah et al., 2020) had an adverse impact as the number of tourists increased.

In recent years, Information and Communication Technologies (ICT) has opened up a new tourism industry (Buhalis & Amaranggana, 2014). According to Syakir Amir et al., 2020, the physical characteristics of a place may attract tourists. However, services and technology offerings also substantially impact tourists' psychological perception of a destination. Therefore, ICT plays an essential key role in shaping the future of tourism. Nevertheless, in this paper, Community Based Ecotourism is seen as having a much more critical role in tourism, especially in developing countries and states that still preserve more of nature which is Sabah itself. Community-Based Ecotourism is expanded and defined as Ecotourism, where the local community has significant control and deep involvement in development and management. Most of the benefits remain in the community (Declaration of Quebec, 2002). Ecotourism in Malaysia today is closely related to sustainable tourism. Sustainable tourism means natural resources, including Ecotourism, culture, and others, that are preserved for continued use in the future without affecting the opportunities of the present society to benefit from them (Mohamdisa Hashim & Mohamad Suhaily, 2010). Organizing operational institutions concerning Ecotourism developed by the community is vital as the community shares the benefits gained through village development and conservation. The government's role is to ensure that the proposal runs smoothly by making arrangements between community members and the private sector and providing training related to the ecotourism business (Amat Ramsa & Abdullah Mohd, 2004). According to a study by Amal Najihah et al. (2018), most local communities and stakeholders in Malaysia need to understand the potential of sustainable Ecotourism that can benefit them now and in the future. This happens because of the need for more awareness among them about land use that impacts nature. More assessment of Ecotourism's potential and the community's lack of motivation to develop the area towards upgraded

facilities, transport, and infrastructure development is needed. Velan et al. (2022) found that the basic idea about the concept of social transformation is limited in exposure. Such concepts are not widely used in their daily lives, even though the government uses the term 'social transformation' in almost all its development policies. This issue had significant relationships as the social transformation concept in CBE represents the community livelihood benefits through their active participation in CBE ventures.

In the 2030 Agenda for Sustainable Development Goals (SDG), the 12th goal, to Ensure Sustainable Consumption and Production Patterns, has been targeted by 2030 to formulate and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products. The importance of emphasizing SDG target 12. b, as a tool to monitor the impact of sustainable development for sustainable tourism. This statement is vowed by the United Nations (UNWTO) on the World Tourism Organization website, where tourism for the SDGs can help achieve each of the 17 UN sustainable development goals. For example, the first goal will help create jobs at the local level and further generate income to reduce poverty and create the necessary investment for entrepreneurial activities in the community.

As the tourism sector develops, it needs excellent and quality tourist guides, which are essential key players in tourism products and experiences. Cohen (1985) touched on the role of the tour guide and argued that the tour guide plays a significant role in the experience of visitors, potentially making or breaking the tour and the experience. The role of the tour guide is to ensure the tour runs smoothly and is safe guiding. Tour guiding takes place in every geographic region of every country (Zillinger et al., 2012). Guiding is one of the world's oldest professions, with early historical accounts referring to pathfinders and cicerone, antecedents of the contemporary guide (Pond, 1993). Regnier et al. (1994), nature guides like Enos Mills (1920) were leading visitors through the North American wilderness and laying the foundations for the profession of interpretation. As tourism becomes more globalized, contemporary guided tours have developed into diverse, multifaceted, context-specific, and adaptable products, offering benefits beyond safety and convenience (Betty & Rosemary, 2015).

A sociological perspective framework by Cohen (1985) presents the various roles and functions of the tour guide as a basis for comparative studies of guiding in a range of environments. He also labels the leadership and mediatory spheres of guiding as outer and inner-directed aspects, which are tasks outside the tour group and tasks directed within the group. Meanwhile, Weiler and Davis (1993) develop a framework depicting the roles of the nature-based/ ecotour leader/ guide. It has three spheres tour management, experience management, and resource management. The responsibility of tourist guides in developing

countries is a means of livelihood that help to reduce poverty (Shephard & Royston, 2000).

This study aims to determine (a) the tourist guides' responsibility through CBE and (b) the challenges faced by tourist guides in Kundasang, Sabah. The findings of this paper also highlight the guide's responsibility and challenges through hill trekking activities for future ecotourism development. To conclude, community-based Ecotourism in Sabah is also growing along with the developments in Peninsular Malaysia. Community-Based Ecotourism (CBE) activities can help community members improve their standard of living. However, the trends guiding the future kept changing according to the macro and micro levels. Such as changes in the market and visitors' preferences, increased urbanization, social and economic changes, and political disruptions. All these will affect the potential implications for tour guiding practice. This paper describes the research background, methodology, literature review, results, and discussion in relation to the article's topic.

## **RESEARCH BACKGROUND**

Kundasang is one of the tourist spots in Ranau. It is a popular place to produce agricultural products due to its hilly terrain and heavy tropical rains that are fertile for agricultural activities. Kundasang locates in the Crocker Range area, with a height of around 4000 to 6000 feet (Ramzah & Amriah, 2008). It is also rich in biodiversity because Mount Kinabalu, the highest in Southeast Asia, is located at Kinabalu Park, not far from the urban centre of Kundasang. As a result, many species and exotic plants exist, such as large pitchers and unique Rafflesia flowers. Tourism was the second most important source of income for the community of Kundasang due to its position between the west coast and east coast regions of Sabah. According to Ramzah & Amriah (2008), Kundasang is considered a strategic location. Some tourist activities around Kundasang are the rabbit farm, Mesilou Cats Village, Desa Dairy Farm and Alpaca Club. Other than that, there were hiking activities, such as Maragang Hill, Mesilou 3 Sixty Peak and Swine Hill. This article will focus on Kampung Mesilou and, specifically, Maragang Hill. Mesilou is located in the highest part and is known as Malaysia's highest and most excellent village (Raihan, Rosazman & Afrizal, 2018). In addition, Mesilou is also known for the settlement of the Dusun community, which has become the primary identity of the village (Raihan, Rosazman & Badariah, 2019). Ecotourism that has dramatically improved Mesilou Village is Maragang Hill and led Mesilou to gain a name in tourism. Other products, such as homestays, were built like mushrooms growing after rain because Maragang Hill received many foreigners who wanted to hike. This ecotourism activity helps the Mesilou community in many aspects of life. Maragang Hill chooses because the researcher wanted to see the challenges faced by tourist guides in ecotourism

activities in hilly areas. Maragang Hill is a particular spot as it opened after the earthquake experienced in 2015. That natural disaster was eye-opening to the community about the importance of diversifying tourism activities as it will affect the source of their income.

**Table 1:** Arrival Statistics of Maragang Hill Climbers, 2017-2022

No	Year	Total of Climbers
1	2017	1427
2	2018	12695
3	2019	15105
4	2020	6835
5	2021	5417
6	2022	7540

*Source: Maragang Hill Manager, 2022*

After the earthquake damaged the hill's path, the community surveyed the area, and the first platform was built in 2017 until Maragang Hill opened its door to the public on 16 September 2017. Maragang Hill is the result outcome and idea from the village community. The successful opening of Maragang Hill has also helped restore the villagers' economy, homestay operators, and stalls around Mesilou Village. From the previous studies, Maragang Hill was the fourth phase of tourism product in the tourism recovery program. A study by Raihan et al. (2019) has further supported the interview data conducted by the researcher in 2021 and 2022. Therefore, the local community's awareness is crucial about the need for other products commercialisation for tourists is a must in the ecotourism-based community (CBE).

## **LITERATURE REVIEW**

(i) The main Concepts Definition.

### *Community-Based Ecotourism (CBE)*

CBE has been termed with various meanings until Fennell (2001) managed to analyze that CBE terms have keywords such as conservation, education, ethics, sustainability, impact, and community benefits are suitable variables to represent the latest studies. Community-Based Ecotourism means different things to different people. The International Ecotourism Society defines it as "Travel to natural areas that conserves the environment and sustains the well-being of local people". While Boo (1992), rephrased it as 'nature tourism that promotes conservation and sustainable development, introducing the element of pro-active conservation and economic development.

### *Tour Guide*

Professional Tour Guide Association of San Antonio (1997) defines a tour guide as someone who has a combination of adequate enthusiasm, knowledge, quality personality, and a high standard of conduct and ethic when leading groups of tourists to a tourist area while making interpretations and comments to the area. Robotic (2010), pointed out that Cohen (1985), was a pioneer in making tourist guides a scientific research subject and gave the origin and evolution of the role of the tourist guide Cohen (1985), has identified that tourist guides carry out four main functions, which are instrumental, social, interaction, and communicative he also identified four types of guides which are Original Guide, Animator, Tourist Leader, and Professional.

### (ii) Theoretical Perspectives

#### *Sustainable Ecotourism Development*

Brundtland's report (1987), more accurate and general, sustainable development meets the needs of the present generation without hindering the ability of the future generations to meet their own needs. Sustainable tourism is formed through economic development, environmental preservation, and social development or socio-cultural development. The three concepts are interrelated to ensure economic, environmental, and social balance on internal and external levels (Meyer & Milewski, 2009). The International Ecotourism has defined ecotourism as tourism that preserves the environment and maintains the welfare of the local population. Ecotourism is seen to have a specific principle which is to contribute to the conservation of nature and cultural heritage actively. Ecotourism is also important in education because it can teach to respect nature and local culture and as a self-reflection for different tourists. Local residents can benefit from generating income through ecotourism (Sambotin, Patrascoiu, Coroian, Merce, 2011).

#### *Social Capital*

Social capital theory emerges from the thought that members of society are unlikely to be able to overcome the various problems faced individually. There is a need for good togetherness and cooperation from all levels of society to overcome the problem. In addition, social capital also refers to the relationship between individuals, social networks, and reciprocity norms and the sense of trust that arises from them (Teuku Afrizal, 2016). Robert Putnam in his book "Making Democracy Work: Civic Traditions in Modern Italy", in 1993 succeeded in popularizing the concept of social capital. Putnam considers social capital as a horizontal relationship between people. That is, social capital consists of a network of social attachments that are regulated by the norms that determine the productivity of society. Social Capital theory is seen to be used in community

involvement where Burkey, (1993), stated that involvement is seen as a process when all decision initiatives and resources management will be shared jointly, and the involvement provides benefits to those involved.

### (iii) Reviews of Previous Research

Velan Kunjoram and Roslizawati (2014), in their study “Community Based Ecotourism (CBE) Development in Lower Kinabatangan of Sabah, Malaysian Borneo”, was conducted with the aim of witnessing local participation in ecotourism activities. From this study, the concept of ecotourism is operated as alternative tourism that relies heavily on nature-based activities and the involvement of the local community is very important so that it can survive in the future and gain success. The method that has been used is qualitative which is in-depth interviews with communities involved in ecotourism activities. The purposive sampling technique is also used because respondents have experience managing ecotourism activities in Abai Village. As a result of this study, local communities are seen managing ecotourism activities such as Forest Habitat Restoration Projects and Homestay activities. Although local communities support ecotourism activities in Abai Village, they also face challenges such as lack of capital resources, lack of public facilities, and communication problems. This had caused development to become uncertain in that area. Mohamad Ridhwan and Salamiah Jamal (2021), “Hiking Tourism in Malaysia: Origin, benefits and Post COVID-19 Transformations” review the basics of hiking tourism, its development, and its significant contribution to the development of relevant publications. A semi-systematic study was conducted to obtain data. The results of this study have been divided into 6 aspects, namely the definition of climbing, adventure tourism trends, the progress of adventure tourism in Malaysia, the relationship with climbers and the benefits of climbing as well as the future of adventure tourism after COVID-19. This study stated that travel tourism has a positive impact on people psychologically. Cevat Tosun and Dallen Timothy (2003), in the article “Arguments for Community Participation in the Tourism Development Process,” display normative capital about the discussion of tourism development involvement. Normative capital is based on 7 recommendations such as the relationship between tourism development involvement, the implementation of tourism plans, and achieving sustainable tourism development. This study wants to develop some recommendations as a framework to understand the involvement of tourism development and it finally focuses on a set of discussions which id to look at the roots of the involvement of tourism development. All the studies above show that community-based ecotourism can be viewed in different aspects of life and the environment. The first study showed that the challenges faced by the community cause the development to fail in an ecotourism area where it should have been a successful

development. The second study has proven that hiking tourism brings benefits, especially in psychological states. Meanwhile, an article by Tosun and Timothy shows that not all the recommendations stated are valid for use in all viewpoints and tourist places. Some of the discussions expressed are irrelevant and suitable for studying tourism development in different places.

## **METHODOLOGY**

This research used a mixed methods approach. Creswell (2008), mixed design study combines quantitative and qualitative data to have a better understanding and explaining the research problem. In addition, Kamarudin et al. (2014), stated that the combined method of two will provide several advantages such as being able to compare quantitative and qualitative data to understand the conflict between the results of the two research methods. The dominant approach of this study is the qualitative approach because Creswell & Poth (2018), mention that qualitative research is conducted when there are problems or issues that need to be explored. This exploration is necessary because it has the need to study groups or populations, identifying variables that cannot be easily measured. Other than that, qualitative is mainly used because the researcher needs a complex and detailed understanding of the issue. Krejcie & Morgan (1970), quantitative research is referred to a study that uses statistics involving a large number of respondents with at least more than 10 samples in measuring the variables of research. The quantitative approach in this study is used as supporting data towards qualitative data. It is supporting data as it did not analyze using ANOVA, regression, and correlation but only tested at the descriptive statistics level. This technique was measured using a 5-point Likert scale to view the respondent's data and to measure the challenges faced by a community member in community-based ecotourism activities. Human behavior and emotions, environmental characteristics, and situations are difficult to understand comprehensively by using only one method. Therefore, the mixed methods approach is the most appropriate way to gain an understanding of this study. The main purpose of using mixed methods is to produce strong qualitative and quantitative research to understand the phenomenon of the study and to strengthen support for the issues that arise. The purposive sampling method is used in this study to obtain research data and related information. Sample selection needs to be done well in order to obtain relevant data. Purposive sampling is used when a difficult-to-reach population needs to be measured and is the key to allowing the respondents to provide ample and justifiable feedback (Pandey & Pandey, 2015). There are 4 data collection methods used in this study including in-depth interview, observation, secondary data, and survey through questionnaire form. Interviews are considered social interactions based on conversation (Warren & Xavia, 2015). Small scale informants which are 8 informants and those who had positions



related to the study location were chosen to be interviewed. Moleong (1989), observation allows the researcher to see and feel the variety of social events and symptoms in it and will form knowledge together between the researcher and the subject. Notes taking and video recordings from the camera are used to help record the observation. All these will be compiled for data management purposes. Other than that, secondary data are used in the study to support information from primary sources which is data that had been collected directly from the field. A survey that is used as a quantitative method is modified following Krejcie & Morgan's (1970) table, where the number of members involved to answer the questionnaire is only 63 respondents although there is a total of 75 people in the organization of Maragang Hill. The qualitative data analysis that is used in this study is thematic analysis. This analysis is highly inductive, themes emerge from the data and not from the researcher (Dawson, 2009). There are 5 fractions to discuss thematic analysis according to Creswell & Poth (2018). While quantitative data analysis is from a survey using descriptive statistical data to describe the characteristics of the sample. The questionnaire will be analyzed using the SPSS (Statistical Package for Social Science) program.

## **RESULTS AND DISCUSSION**

### *Tourist Guides Responsibility*

The responsibility of tourist guides shown in this study was the same as the general responsibility of all guides worldwide. But there were some unique roles played by the tourist guides of Maragang Hill, Kundasang, Sabah. This study indicated that there were four responsibilities of the tourist guides such as provide additional information, safety briefing, giving information about flora and fauna, and hiking rules. Tourist guides in Maragang had to carry out various responsibilities to ensure that the CBE activity, hiking, brought a positive outcome to members and the community of Kampung Mesilou itself.

*The first* responsibility was to provide additional information to the tourists. Guides will give the history of Maragang Hill and Kampung Mesilou as this will help promote Mesilou to tourists who come to hike. Guide also gave information about the other CBE activities that are available such as visiting Aquafarm dan hiking to Mesilou 3Sixty Peak just opened this year. All these activities gave choices for tourists to try while in Mesilou. The variety of activities will then attract more visitors and further bring profit to the tourism sector in the area. The CBE in Mesilou and Maragang Hill organisation will benefit and advance together. As informant 11 stated about this:

*"I think if someone asks about Mesilou 3 Sixty Peak, we will recommend that there is one long trail in the village,*

*Maragang Hill. So, he has to have an understanding and support each other” Informant 11, 2022.*

**The second** is a safety briefing, which needed to give at the beginning of the hike. Every hike that took place needed to start with a briefing, and this often appears in the interviews that the researcher did with the guides. Informant 6 stated that:

*“Okay, the first guide is a guide who takes these tourists up Maragang Hill. From there, before hiking, he will give a safety briefing, what is allowed and what is not allowed during the hike; he will monitor every move of the tourists.”*  
Informant 6, 2022.

Maragang Hill and its guides always took briefing and safety as the most important while hiking. This is to minimize accidents and injuries from happening. Guide’s task becomes heavy when human life is involved. This makes the Maragang Hill organization conduct courses for the guides so that they are always mentally and physically prepared, even if any incident occurs.

**Third**, the guides have the role of giving information about flora and fauna to the tourists. Maragang Hill is rich in biodiversity, like red monkeys, also known as Lotong or Maragang by the local community. The conservation status of Lotong has been categorised as vulnerable, according to the International Union for Conservation of Nature (IUCN). The top of the peak is named after that monkey because it became the main route to the west or east of the forest. In addition, pitchers, which are unique plants, are found around Maragang trail too. The guide will give out information to the climbers to keep their interest in hiking and to make the trip much more fun and less tedious. This will also give out additional knowledge to the climbers. By sharing knowledge, climbers will start to appreciate the environment. This brings good to nature that has been made into the CBE area. In addition to bringing profit, nature is also preserved by the learning tourists gain from guides about flora and fauna found at Maragang Hill.

**The fourth** responsibility of guides is about hiking rules. Each activity carried out under Maragang Hill has its own rules. For example, tourists should always keep the area clean by not littering. Other than that, listening to instructions from the guide is very important and is one of the hiking rules that must obey by all the parties. Informant 5 stresses this issue:

*“Usually, when we give a briefing, some don’t listen. We try to reprimand first in a good way. Besides, for me, the undisciplined are those who throw garbage and pick out*

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*flowers around the trail. But what I usually see is just shouting.*” Informant 5, 2022.

In Maragang Hill, rules are highly emphasised because, without rules, an organisation will not be able to function properly and systematically. In addition, the rules are essential so that hiking goes smoothly and the ecotourism area is maintained well.

#### *Tourist Guides Challenges*

This study also indicated tourist guides’ challenges while conducting CBE in Maragang Hill. Analysis of both methods, in-depth interviews, and surveys showed that there were four challenges faced by guides. Among them are funded, the nature of tourists, management systems, and communication.

#### *Financial Problems and Allowances*

The issue of funds is an issue often mentioned by informants. This happens because every aspect of building Maragang Hill is done by the community members themselves without the help of any party. When financial problems appear as an issue, it will cause other problems to appear as well. For example, the distribution of payment of community members involved and the problem of getting materials while improving the trail. This statement is supported by an interview conducted with Maragang’s manager,

*“The funds are for buying all those things, and we have to have funds like equipment for all the construction”,*  
Informant 2.

In addition, informant 4 stated that although there was help from NGOs, it only came after they saw the potential of Maragang Hill as successful community-based ecotourism. Before Maragang Hill became famous and went up as it is now, all the construction was done by the community members. This clearly shows that help from outsiders is little, and it is difficult to get the help needed.

*“When we opened this Maragang, we started from empty plastic, so even a nail was collected from the villagers. So slowly, we work ourselves up. Like the first platform was built in 2017, the second in 2018 and the third platform was built in 2019. So, step by step,”* Informant 4.

Next, the allowance issue is also discussed under financial problems because it is related to each other. But this issue is not as big as the financial issue in Maragang Hill. There were a few informants from the results of the interview and survey stating that they hope for an increase in their salaries. This is in line with the increase in the price of goods and the economic problems that plague the country.

*“So far, it’s satisfactory. If possible, the price of goods is increasing day by day, so maybe we will make a petition to the climber if he agrees that his payment will be increased by RM20-RM30. Increase the guide fee slightly, the same as for the vehicle”.* Informant 5.

*“The payment to the guide is always not enough. Because what we’re looking after is not a tree stump, right? Human life, so his risk is very high. If anything happens, the first responder is the guide. So, if you think it carefully, it is not enough, but we balance it with our tasks and what we are involved in”.* Informant 5.

#### *The Various Attitude of the Tourists*

This became a challenge because the number of tourists consistently exceeds the number of community members, indirectly inviting various reactions and tourists. If the tourists can adapt to changes quickly, it is easier for the guides and organisers to take care of them. But if community members collide with tourists who are chattier and more challenging to adapt to changes, it will make tasks difficult. From the interviews, most tourists who came showed a variety of reactions. For example:

*“For me, the challenge when bringing tourists so far is to serve them only. You have to be patient because sometimes the challenge is significant. You want to control every tourist. If there are more than five people, you must take care of 5 heads.* Informants 4.

The above statement is also supported by informant 3. She stated that with experience climbing Maragang more than 200 times and is also a mountain guide on Mount Kinabalu, she had met various types of climbers. It is a process for the guide to handle the situation if the climber does not listen to directions. Therefore, among the criteria to be a guide, he needs to be patient and able to overcome the situation calmly.

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*“He’s like, the longer we go up; he’s asking how far away? Not close. When he goes up 3 minutes, is it far away? We’ll psycho him a little, talk later, we’re in the herbal area now, if we make him talk, he’ll be careless and forget to ask”  
Informant 3.*

Next, although it is difficult to contain the diverse nature of climbers, the most worrying is when climbers don’t listen to instructions and safety briefings by the guides. Throughout the interviews conducted, the majority said that the safety aspect is essential when doing climbing activities, and they are very strict in such matters. Briefing given before the climb is essential to maintain the safety of climbers and guide themselves. This is to avoid the risk of falling and severe injury to those who follow the activity.

*“Usually, when we give a briefing, some don’t listen. We try to reprimand in a good way first. Otherwise, we call Marangang’s hill department.” Informant 5.*

*Marangang Hill Ecotourism Activity Management System Needs to Be More Systematic*  
A good management system will develop an organization; therefore, it is important to have a layout and system that can make it easier for the organization to work. It became a challenge because, before the booking system, the Marangang only used the WhatsApp application, which could have been more practical to receive a large number of climbers at one time. Marangang Hill also did not use the booking method through the website initially because the number of people who want to climb is less than it is now. As Informant 6 mentioned:

*“Before this, we did not have a good system to manage this Marangang. We received climbers before using the WhatsApp application. But due to the high demand and we cannot control the entry of tourists ourselves, so we created a system using the booking system. That’s why we created a website where climbers can access and book directly through the website. But through the limit we have set”. Informant 6.*

In addition, this management system is also related to the relationship between the guide and the manager. A good relationship among them will minimise the occurrence of misunderstandings and further affect the management of Marangang Hill. This relationship needs to be maintained and mutually tolerant because without the leader, there will be no one to lead, and without the guides,

Maragang Hill will not be moved until now. Informant 8 expresses his views on this issue:

*“The relationship between the guide and manager is very important. Sometimes manager also gets dizzy looking for a guide when no one comes, so the challenge is that he gets angry. So, before he does the calling, come there ready. The most important thing is respect”.* Informant 8.

Management system in scheduling also plays an important role. If it is not organized well and effectively, the number of guides available is insufficient with the number of climbers who came during that period. Scheduling is also essential so that it is consistent with the work of other community members, such as gardening and carpentry.

**Table 1.1:** Maragang Hill Ecotourism Activity Management System Needs to Be More Systematic According to Respondents (N= 63)

No.	Matter		Likert Scale					Total
			SD	D	N	A	SA	
1	I need to gain more exposure as a tourist guide by attending safety courses and training.	%	0	0	7.9	28.6	63.5	100
		Freq	0	0	5	18	40	63
2	Training as a tourist guide informally is sufficient for me.	%	1.6	7.9	20.6	31.75	38.1	100
		Freq	1	5	13	20	24	63
3	The individualistic attitude among tourist guides causes the relationship gap between them to grow.	%	1.6	4.8	22.2	30.2	41.3	100
		Freq	1	3	14	19	26	63
4	I have limitations in handling hiking equipment.	%	9.5	11.1	34.9	20.6	23.8	100
		Freq	6	7	22	13	15	63
Note: SD; Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree								

*Source: Authors, 2022*

The above statement has been supported by the results of the survey. 63.5% representing 40 people, overwhelmingly agree that they need to get more exposure as a tourist guide by attending safety courses and training, while those who agree were 28.6% representing 18 people. This shows that almost 100% of respondents agree they need to attend courses to strengthen their exposure to

safety aspects. Next, for informant training aspect was also approved by respondents, which 69.85% representing 44 people. Those who disagree are a total of 9.5% representing only six people. This proves that training informally with community members who are former Mount Kinabalu guides is still relevant until now. In addition, an individualistic attitude can cause a gap between guides was approved by 71.5% representing 45 respondents. This has proven that the attitude is mutual tolerance and helping each other is essential among guides. Disagree with this statement only represents 6.4% which is only four people out of 63 people. This survey also found that limitations in handling hiking equipment are also a possible challenge to guides. 44.4% representing 28 people, agree with the statement, while 20.6%, 13 people, disagree. This is because they have been guides for extended periods and have pervasive experience. Therefore, no hiking equipment becomes a problem for them. 34.9% representing 22 people, chose medium scale because there are tools that are easy to handle and those that are difficult to operate. Hence, the choice on a medium scale was selected by the 22 guides.

#### *Language Problems when Communicating with Tourists*

Issues related to language and communication will arise if it relates to society. As a manager and guide who must constantly face various tourists, it is unavoidable in tourism because with the presence of tourists, there will be revenue that goes into the organisation. According to informant 8 in the interview, their experience as a mountain guide in Kinabalu made the issue of speaking in a foreign language, such as English, not a big deal because, from experience, he learns from mistakes and corrects them. Informant 8 reports on this issue.

*“Okay, I’m used to getting that. For me, if you get foreign people, you have to speak, then if you get Chinese, if they can speak Malaysian, I will speak Malaysian, so they understand. The most important thing is communication so that we understand each other”.* Informant 8.

According to informant 6, he stated that Maragang Hill lacks guides who can communicate well with foreign tourists. He also stated that the language issue is a challenge because of the difficulty in understanding the wishes of the climbers when bringing them. But the guides at Maragang Hill will try to provide the best service and communicate even using simple sentences. The most important thing, according to him, is mutual understanding between the guide and climber.

*“We lack guides who can communicate well with climbers. For example, if we get from Australia, Korea, or Japan. But usually, the guides who get tourists from abroad will specialise in guides who can communicate in good English. We usually do that”.* Informant 6.

The above statement has been supported by a survey conducted on 63 respondents. The total number of respondents who chose scales 4 and 5 is 41.28%, representing 26 people. While those who choose scales 1 and 2 that disagree are 12.74%, representing eight people. Although those who disagree have a small amount compared to those who agree, respondents who chose scale 3, which is medium, are 46%, representing 29 people. This matter proves that guides can communicate in foreign languages, but self-doubt among themselves causes this communication issue to persist among them. In addition, in the aspect of having limitations to communicating with foreign tourists, most choose to agree, which is 44.5%, representing 28 people. For those who choose on the scale, the medium is 33.3%, equivalent to 17 people.

**Table 1.2:** Language Problems When Communicating with Tourists  
According to Respondents (N=63)

No.	Matter		Likert Scale					Total
			SD	D	N	A	SA	
1	I can communicate in English and Foreign Languages	%	7.9	4.8	46.0	22.2	19.1	100
		Freq	5	3	29	14	12	63
2	I have limited communication with foreign tourists.	%	7.9	14.3	33.3	28.6	15.9	100
		Freq	5	9	21	18	10	63
Note: SD; Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree								

*Source: Authors, 2022*

This point shows that they acknowledge limitations when communicating with foreign climbers. Maragang Hill members continue to perform their duties as professional guides and transparently despite facing some challenges. Based on the analysis above, tourist guides' responsibilities through CBE are equally considered balanced, and the challenges that came through are related to each other, as it is proven by both methods, in-depth interviews and surveys. Both methods show that guides in Maragang Hill can lift their roles, although it might be caused trouble and insufficient by time. Tourist guides are seen to work happily and manage to play their roles perfectly to entertain tourists and to bring a positive outcome to Maragang Hill organisation and Kampung



Mesilou from CBE activity which is hill trekking. The guides' responsibility in Maragang Hill is to organize, and each of them knows their schedule well and tries to give their best in guiding tourists. Most tourists kept repeating their hiking as the services provided were excellent, and they were willing to pay to enjoy the majestic view of Maragang and Mount Kinabalu. As for the challenges that tourist guides faced, they overcame them. Some of the challenges will stay as it came equally with the hiking activity, for example, the various nature of tourists and the language barrier. For the various type of tourists, guides can only be patient and hope those future tourists able to be more considerate and able to fit into changes quickly. This helps both parties to have significant and amazing memories while hiking. As for language and communication, hoping guides can learn and try their best so that tourists and guides can understand each other and minimize miscommunication. Besides that, funds and systematic management were the challenges Maragang overcome in recent years. Maragang Hill is making more as hiking becomes one of the popular ecotourism activities in Sabah. This led to Maragang in having better and more systematic management in their organisation, such as a booking system by a website and a better trail for hiking than before.

## **CONCLUSION**

Overall, this study has demonstrated an understanding of the tourists' guides' responsibility and the challenges faced by them through CBE activity. The responsibility shown by guides is that they have high self-esteem and tend to be more responsible with their job scope. Guides that have been interviewed agree with the statement that guiding is a job that brings joy to them and tourists too. Maragang Hill guides are dedicated to putting their best into every hiking moment. This study took a turn by looking at the challenges faced by tourist guides, and they were able to overcome some of the challenges. Pinpointing the problem that guides faced helps to make Maragang Hill organisation better and more independent in the future. The existing challenges occur as they involve the relationship between humans and nature. This then led Maragang Hill into much deeper responsibility than before. This study is expected to be able to provide some reference and additional information to readers and subsequent researchers.

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## **DIFFERENTIAL URBANISATION IN MALAYSIA, 1980-2010**

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### **Abstract**

In the early 1970s, urbanisation shifted towards counterurbanisation in most developed countries. In contrast, there is little evidence that developing countries will experience counterurbanisation due to the complexity of their historical, economic, and social conditions. To examine the transition process, Geyer and Kontuly (1993) introduced differential urbanisation theory to explain the concentration and deconcentration of populations in urban systems (from urbanisation to polarisation reversal to counterurbanisation). Most studies have applied this theory in developed country settings, but few have done so for developing countries and none have done so in the Malaysian context. This paper tested the theory in the Malaysian setting to consider the extent to which the theoretical assumptions are supported or challenged. In addition, compared to previous papers, this paper focuses far more on the nature of migration flows leading to urbanisation in terms of the relative contributions of net migration and natural increase to population change, as well as origin-destination migration flows in total and according to age structures. The results show that natural increase, rather than migration flows, was the dominant cause of urbanisation in all settlement types. This was due to the population momentum effect of high fertility levels, primarily after the Second World War, which resulted in the birth of a large number of females who later grew to childbearing age. Malaysia experienced the second stage of urbanisation (Intermediate Primate City) after 1980 but had shifted towards the final stage (Advanced Primate City) by 2000. This analysis of three decades (1980-2010), however, shows clear evidence of urbanisation but no evidence of polarisation reversal or counterurbanisation. Due to the continuous rapid urban development and growth in the largest city, the capital metropolitan area, and if the current migration trends persist in the future, Malaysia may never experience polarisation reversal or counterurbanisation.

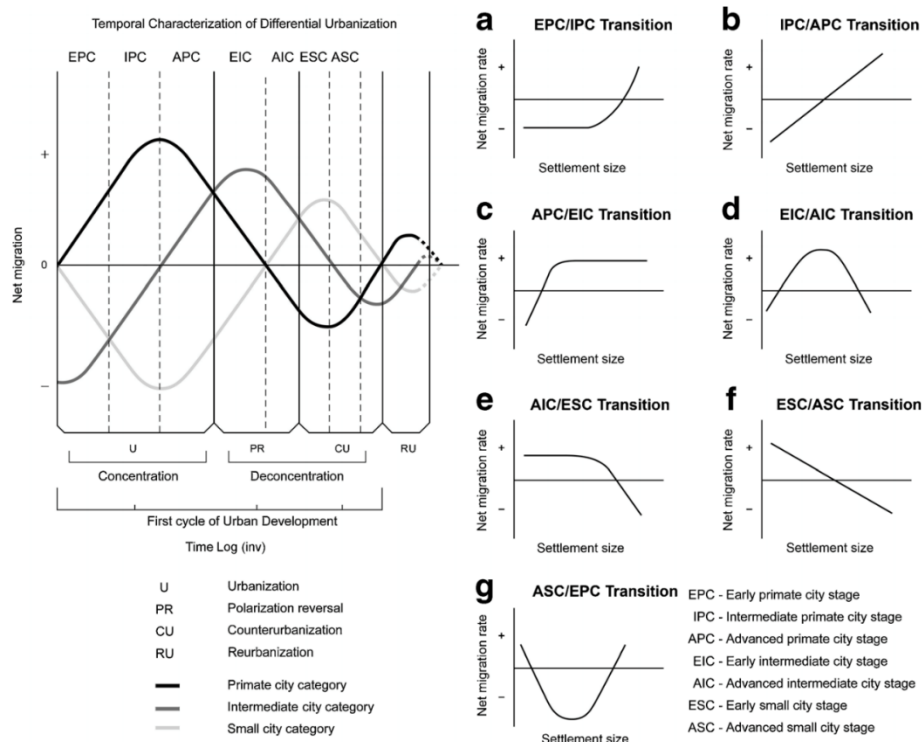
**Keywords:** Urbanisation, internal migration, population, city stages, developing country.

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## **INTRODUCTION**

Urbanisation in developing countries has rapidly increased since 1950 and shares some similarities with the urbanisation experienced in developed countries. On the other hand, there are differences, most notably that urbanisation has occurred much faster in developing countries. According to Jedwab, Christiansen, and Gindelsky (2015), it took more than 100 years, from the eighteenth to the nineteenth centuries, for developed countries (particularly in Europe) to reach 40 per cent urbanisation. In comparison, developing countries reached the same stage almost twice as quickly between 1950 and 2010. However, in the early 1970s, most developed countries experienced a change in urbanisation patterns - the concentration of the population in metropolitan areas reached its peak, which was followed by a deconcentration of the population, with small and medium-sized cities experiencing higher net migration flows than the largest city (see Argent & Rolley, 2012; Berry, 1980; Champion, 2003; Coombes, Longa, & Raybould, 1989; Halliday & Coombes, 1995; Kontuly & Vogelsang, 1988). Since then, urbanisation has shifted towards counterurbanisation, which can be interpreted as the movement of the population from a concentrated region to fewer concentrated areas; this includes movement beyond the metropolitan boundaries (Champion, 2003). Counterurbanisation has arisen for many reasons: clustering job opportunities, access to higher-level services, more housing choices, the establishment of new towns, stringent urban planning controls, and regional policies (such as new investment outside major cities) (Hosszú, 2009).

To examine the transition from urbanisation to counterurbanisation, Geyer and Kontuly (1993) introduced differential urbanisation theory to explain the concentration and deconcentration of the population in a temporal sequence within an urban system. Figure 1 shows the model of this theory.



**Figure 1:** Model of differential urbanisation theory  
 Source: Geyer Jr and Geyer (2015:3)

The transition between the stages of urbanisation can be identified by a change in which settlement type attracts the greatest net migration flows. For example, the primate city urbanisation stage occurs when net migration to the largest city exceeds net migration to other cities, while counterurbanisation occurs when net migration to small cities exceeds net migration to large and medium-sized cities. Between urbanisation and counterurbanisation, there is a polarisation reversal stage in which medium-sized cities have larger net migration in-flows than large and small cities. Despite the pivotal role of both migration and total population size in informing differential urbanisation theory, some papers have examined the theory based only on the overall population change (Gedik, 2003; Gwebu, 2006; Mookherjee & Geyer, 2011), whilst others have looked only at changes in net migration flows (Champion, 2003; Heikkila, 2003; Tammaru, Kulu, & Kask, 2004). According to Kontuly and Dearden (2003), the application of the theory should be addressed to each demographic component (natural increase and net migration), rather than simply to the total population

change, because the factors influencing each component differ, which may result in the separate components displaying different urbanisation trends. For example, different urbanisation patterns were identified in western Germany between 1939 and 2010, according to the type of measure used (population change, net migration, or natural increase) (Kontuly & Dearden, 2003). To date, most studies have applied differential urbanisation theory in developed country settings (Bonifazi & Heins, 2003; Champion, 2003; Heikkila, 2003; Kontuly & Dearden, 2003; Nefedova & Treivish, 2003; Sander, 2014; Tammaru et al., 2004), with few having done so in developing countries (Gedik, 2003; Geyer, 2003; Gwebu, 2006; Mookherjee, 2003). None have done so in the Malaysian context.

During recent decades, Malaysia has experienced rapid urbanisation and has had the fastest rate of urbanisation of all South-East Asian countries: 70 per cent of the population was estimated to be living in urban areas in 2010 (Yaakob, Masron, & Masami, 2010). The existing urbanisation studies show that large cities in Malaysia have lost their primacy to the surrounding suburban areas due to the continuously declining population growth since 1970 (see Abdullah, 2003; Hasan & Nair, 2014; Osman, Abdullah, & Nawawi, 2017). However, these studies focused only on the total population change of large cities in Malaysia.

The primary contribution of this paper is to present the first application of differential urbanisation theory to Malaysia, with a view to developing a better understanding of the recent history and current trajectory of urbanisation in the country. In doing so, the paper makes several other key contributions to the development and application of differential urbanisation theory. This paper is the first to fully consider the relative contributions of net migration and natural increase to the overall urbanisation process, helping to highlight a potential internal contradiction in a theory based primarily on net migration rates alone. Collectively, the analyses presented offer clearer insights into the process driving differential urbanisation and the considerations that others should take into account when undertaking similar analyses in different country settings.

## **BACKGROUND**

Historically, the modern urban system in Malaysia was first initiated by the British colonial regime to strengthen their control over and further exploit the country. Urbanisation and population growth in Malaya (the name of the country before Malaysia was formed in 1963) were mainly driven by significant international immigration from China and India. These immigrants were allocated to and nearby towns by the British colonial regime due to the increasing demand for war-related workers during the Second World War (Lestari, 1997). After the war, population growth was entirely sustained until 1960 by the natural population increase that occurred as a result of the high fertility levels caused by improved nutrition, preventive health programs, and greater access to curative medicine (Department of Statistics Malaysia, 2021). However, from the 1960s



onwards, fertility levels began to decline continuously. This was caused by several factors: social change, improved education, women's empowerment in the working sector, and postponements of marriage and childbearing. Mortality, on the other hand, has been declining since at least the 1950s and continues to do so (Department of Statistics Malaysia, 2021).

Besides natural increase, urbanisation and population growth in Malaysia have also been influenced by rural-urban migration. Resettlement programs imposed by the colonial regime forced rural communities to migrate into new settlements with the aim of denying or blocking insurgent forces from receiving support from these communities (Yaakob et al., 2010). Migration provided opportunities for communities to become involved in commercial, trading, and mining activities in the new settlements. Furthermore, the opening of tin mines encouraged the large-scale in-migration of workers, which led to the establishment of more seaports for trading activities. In time, mining and industrial growth were unable to meet the increasing demand for labour caused by rapid rural-urban migration (Yaakob et al., 2010). The large concentrations of the population in cities had a major impact on urban development and growth while also putting pressure on the Malaysian government to devote more expenditure to housing, educational, health, and institutional facilities.

Geographically, the distribution of urban centres in Malaysia is uneven. Mostly located in high-density areas in the west coast region of Peninsular Malaysia, these centres have existed and grown continuously since the colonial period. Major urban centres such as Kuala Lumpur, Georgetown, and Johor Bahru became the main destination for migrants seeking better economic and social opportunities. However, the primacy of these cities has eroded since the 1980s due to a decline in urban population growth, and the population concentration has shifted towards suburban areas (Abdullah, 2003). In 2000, the proportion of the population in the largest city, Kuala Lumpur, was almost on par with the surrounding suburban areas. The same phenomenon occurred in Georgetown and Johor Bahru, where the areas adjacent to these cities had a larger proportion of the population in the same year. The Kuala Lumpur Structure Plan 2020 Report (2003) stated that the decline in population growth is one of the main problems facing Kuala Lumpur (Dewan Bandaraya Kuala Lumpur, 2003).

## **URBAN AND RURAL FRAMEWORK IN MALAYSIA**

The urban-rural framework of Malaysia depends highly on the definitions and measurements used. It has also changed over time. Various urban-rural definitions and boundaries are offered by two Malaysian government agencies: the Federal Department of Town and Country Planning Peninsular Malaysia (FDTCPM) and the Department of Statistics Malaysia (DOSM). These agencies were created to serve different purposes, hence their different definitions of urban areas. For example, according to the Department of Statistics Malaysia, the

country had 149 cities in 2010. In contrast, the FDTCPM identified 288 cities (Federal Department of Town and Country Planning in Peninsular Malaysia, 2016).

According to Yaakob et al. (2010), urban areas in Malaysia were first defined in 1947 by the DOSM as those with a population of 1,000 or more. In 1957, the definition was updated to include municipalities, town council areas, town board areas, local council areas, new villages, and villages. In 1970 and 1980, the definition was revised to avoid including small settlements by increasing the minimum population to 10,000 or more. The definition was further revised in 1991 and 2000 to include adjoining built-up areas where 60 per cent of the population (aged 10 years or more) was engaged in non-agricultural activities and at least 30 per cent of the housing had modern toilet facilities (Hasan & Nair, 2014). In 2010, the modern toilet facilities criterion was removed, and the minimum age for the working-age group was increased to 15 years or above. These changes were made because almost all houses had modern toilet facilities and the Labour Force Survey showed that the working age started at 15. The 2010 definition is given in the following statement, which has been used until now by the DOSM:

*Gazetted areas with their adjoining built-up areas which had a combined population of 10,000 or more at the time of the Census 2010 or a special development area that can be identified, which had a population of at least 10,000, and where at least 60% of the population (aged 15 years and above) were involved in non-agricultural activities.*

The FDTCPM (2016) uses a similar definition, with two extra criteria for defining urban areas: 1) a population density of 50-60 people per hectare and 2) the presence of urban infrastructure and facilities. Overall, the agency outlines seven levels of urban hierarchy and the corresponding boundaries: National Growth Conurbation (population of more than 2.5 million), Regional Growth Conurbations (populations of 1.5 to 2.5 million), Sub-regional Growth Conurbations (populations of 0.5 to 1.5 million), State Growth Conurbations (populations of 0.3 to 0.5 million), District Growth Conurbations (populations of 0.1 to 0.3 million), Major Settlement Centres (populations of 30,000 to 0.3 million), and Minor Settlement Centres (populations of 10,000 to 30,000).

The urban-rural boundaries used by both agencies do not provide the comprehensive data needed to adopt a differential urbanisation theory approach or examine urbanisation comprehensively. For example, it is impossible to identify which cities are large, medium, or small from the urban boundaries outlined by the DOSM because all cities are simply characterised as urban areas. Further, migration data is recorded simply as urban-rural, rural-urban, or urban-

urban at the state level instead of using more detailed urban and rural classifications. Although the FDTCPM provides a detailed hierarchy of cities and their boundaries, the other information provided is rudimentary (e.g., total population, population density, and total land area). Finally, as has been noted, the definitions change over time, whereas analyses of differential urbanisation theory conventionally adopt a ‘static’ (over time) set of spatial boundaries (Kontuly & Dearden, 2003).

Given the limitations, the existing urban-rural units from both agencies are not ideal for applying differential urbanisation theory. In contrast, the data relating to the existing small-area units (districts) is sufficient to permit the application of differential urbanisation theory to Malaysia.

## RESEARCH METHOD

The data used in this paper was sourced from the Malaysian Censuses of 1980, 1991, 2000, and 2010. Of particular importance was the migration matrix, which captures district-level population flows between origins (places of residence five years prior to the census) and destinations (places of residence at the time of the census), disaggregated by age.

Because migration data is recorded by the census on a five-year basis, no official migration data exists for the first five years of each decade examined in this study (1980-1986, 1991-2005, and 2000-2005). These missing values were estimated by linear interpolation:

$$NM_{t2} = \left( \frac{NM_{t1} \pm NM_{t3}}{2} \right) \pm NM_{t3}$$

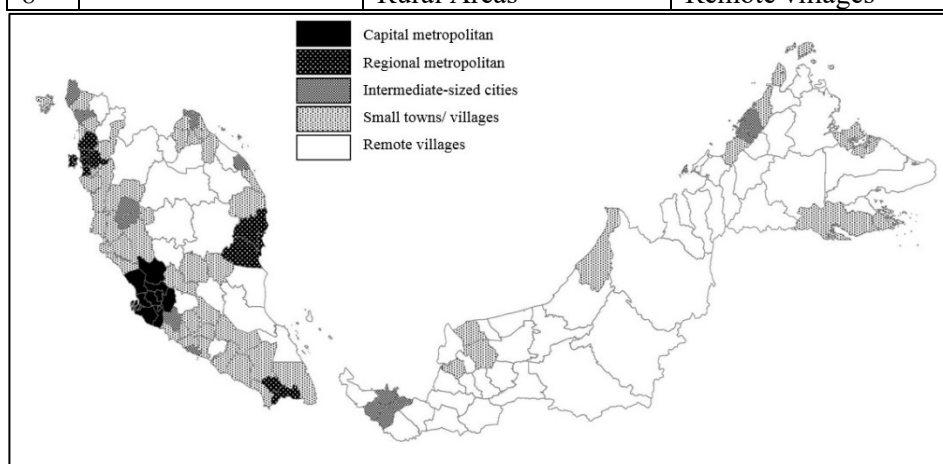
Where  $NM_{t1}$  is the net migration of the first five-year period,  $NM_{t3}$  is the net migration of the third five-year period, and  $NM_{t2}$  is the net migration between  $NM_{t1}$  and  $NM_{t3}$ .

Once the missing values had been interpolated, the next step was to classify each district by settlement type (see Table 1). Differential urbanisation theory offers no specific guidelines on how to differentiate settlement types, except that they must be located independently from each other (Geyer & Kontuly, 1993). For example, urban built-up areas in medium-sized and small cities must be independent and located beyond the boundaries of larger metropolitan areas. This requirement was met by the existing FCTCPM settlement hierarchy, which provided the starting point for the classification of districts by settlement type. The FCTPPM settlement hierarchy was simplified to facilitate the analysis. Table 1 maps the FCTPPM settlement hierarchy onto the ‘Primate’, ‘Intermediate’, and ‘Small’ city categories included in the original work on differential urbanisation theory, as well as onto the five-category settlement hierarchy used in this paper. The district classification then had to take

into account the fact that the boundaries of the official FDTCPPM settlement hierarchy respected the shapes of contiguous urban built-up areas rather than the boundaries of the census districts for which census data is available. Thus, each district was allocated to the settlement type that predominated in that district. Figure 2 shows the newly developed district-based urban-rural urban hierarchy.

**Table 1:** New settlement classification

No.	Settlement classification in differential urbanisation theory (Geyer & Kontuly, 1993)	Malaysia settlement hierarchy (FDTCPPM, 2016)	New settlement classification
1	Primate/Largest city	National Conurbation	Capital metropolitan
2	Intermediate-sized cities	Regional Conurbations	Regional metropolitan
3		Sub-regional Conurbations	Intermediate-sized cities
4		State Conurbations	
5		District Conurbations	
6	Small-sized cities	Major Settlement Centres	Small towns/villages
7		Minor Settlement Centres	
8	-	Rural Areas	Remote villages



**Figure 1:** New urban-rural spatial boundaries built using district units

## RESULTS AND FINDINGS

This section presents an analysis of population change in Malaysia in light of differential urbanisation theory. First, as with previous applications of demographic urbanisation theory, the overall population change was considered. This was then contrasted with the other perspectives on urbanisation by focusing solely on net migration flows. Attention was then given to the relative contributions made by natural increase and net migration to the overall population changes – which is unprecedented in applications of differential urbanisation theory – helping to highlight a potential shortcoming in previous analyses that fail to do so.

### Overall population change

Since 1980, the population of Malaysia has continued to grow but the growth rate has slowed. This trend holds true across all settlement types, from the capital metropolitan core to remote villages. The more urban the area, the higher the growth rate, with only one exception: remote villages out-stripped growth in small towns/villages in 1980 (Figure 3). As a result, since 1980, the population of Malaysia has continued to urbanise, with capital and regional metropolitan areas gaining an ever-greater share of the nation's population at the expense of small towns/villages and remote villages (Figure 4).

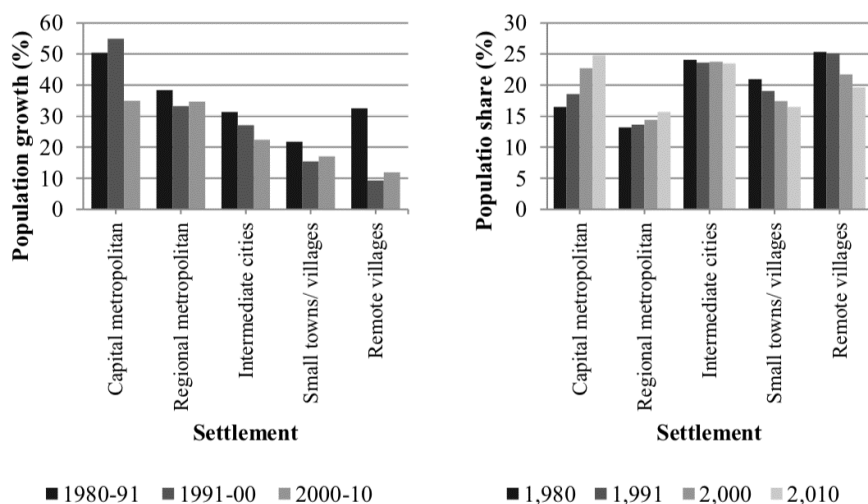
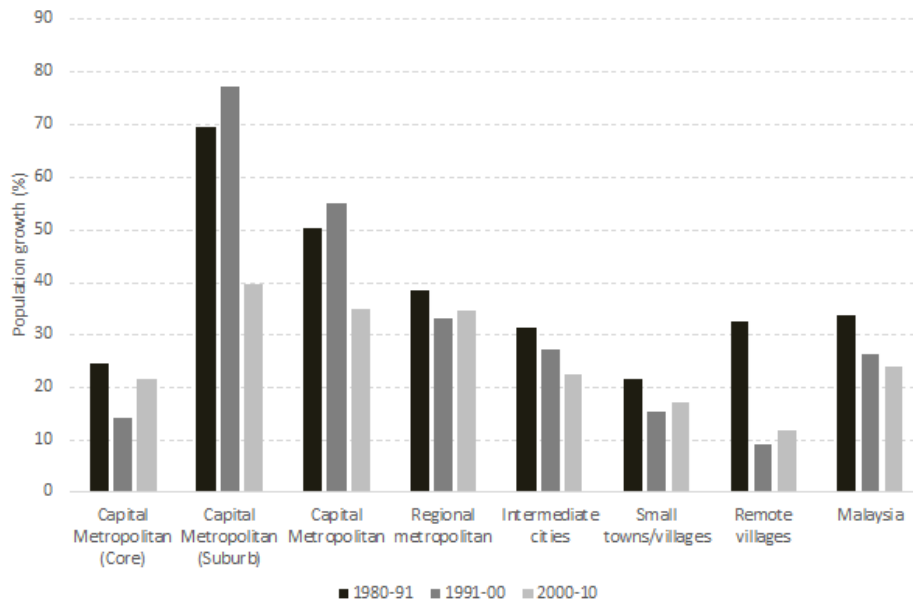


Figure 3: Population growth and share by settlement type, 1980-2010



**Figure 4:** Population growth in Malaysia, 1980-2010

Several authors have used evidence of this kind to situate the country being assessed within a particular stage of the differential urbanisation theory model (Gedik, 2003; Gwebu, 2006; Mookherjee & Geyer, 2011). This approach is problematic for two reasons. First, it fails to disentangle the relative contributions to urbanisation of net migration and natural increase (the local surplus/deficit of births over deaths), making the implicit assumption that both are pulling in the same direction. Second, Geyer repeatedly made it clear that DUT was conceived in relation to the changing nature of migration flows between types of urban areas, not in relation to overall changes in their population or variations in natural increase rates (Geyer Jr & Geyer, 2015). Geyer’s rationale for this focus was based on the mutually reinforcing nature of flows in capital, jobs, and people. In this paper, we tread a middle ground. We share Geyer’s sentiment that migration flows ultimately tell us more about the nature of the urbanisation process than variations in natural increase rates between different categories of urban areas. On the other hand, we recognise that differences in natural increase rates can lead to urbanisation, both in the narrow sense of ‘growth in urban share of the population’ and in the broader sense advanced by Dyson (2010), in which population growth arising from natural increase is in turn the trigger for the kinds of economic, political, and societal transformations and migration flows that lead to urbanisation as an economic/development process. To tread this middle ground, we first examine the variation in net migration rates by settlement type, in line with differential urbanisation theory. We then seek to

disentangle the relative contributions of net migration and natural increase to the overall population change, providing a clearer context for a subsequent analysis of the direction of these flows.

### **Net migration flows**

As illustrated in Figure 1, differential urbanisation theory classifies the stages of the urbanisation process by appealing to the rates rather than the sizes of net migration flows. Urbanisation is observed when the net migration rate in large cities exceeds the rate in medium-sized and small cities. Polarisation reversal occurs when the net migration rate in medium-sized cities exceeds the rate in large and small cities, while counterurbanisation arises when net migration into small cities exceeds net migration into large and medium-sized cities. In recent decades, net migration rates in Malaysia have followed three basic trends, as illustrated in Figure 5. First, net migration rates have been substantially larger in metropolitan areas and small towns/villages than in intermediate cities and remote villages, although the gap is narrowing. Second, net migration rates have generally fallen over time, in particular, across all settlement types over the last two intercensal periods. Third, whilst the capital metropolitan core experienced continuous net outflows, the capital metropolitan suburban areas experienced continuous net inflows. This represented a phase of population over-spill rather than counterurbanisation. Relating these findings to differential urbanisation theory, Malaysia from 1980 to 2010 was clearly still at the urbanisation, or concentration, stage, due to the continued dominance of large net inflows into the largest city, i.e., the capital metropolitan area.

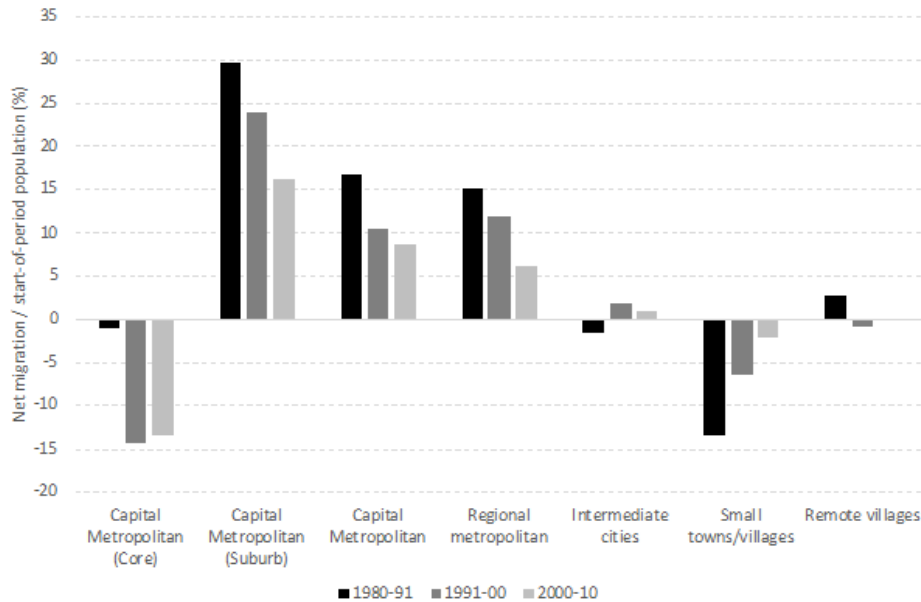


Figure 5: Net migration rates by Settlement Type, 1980-2010

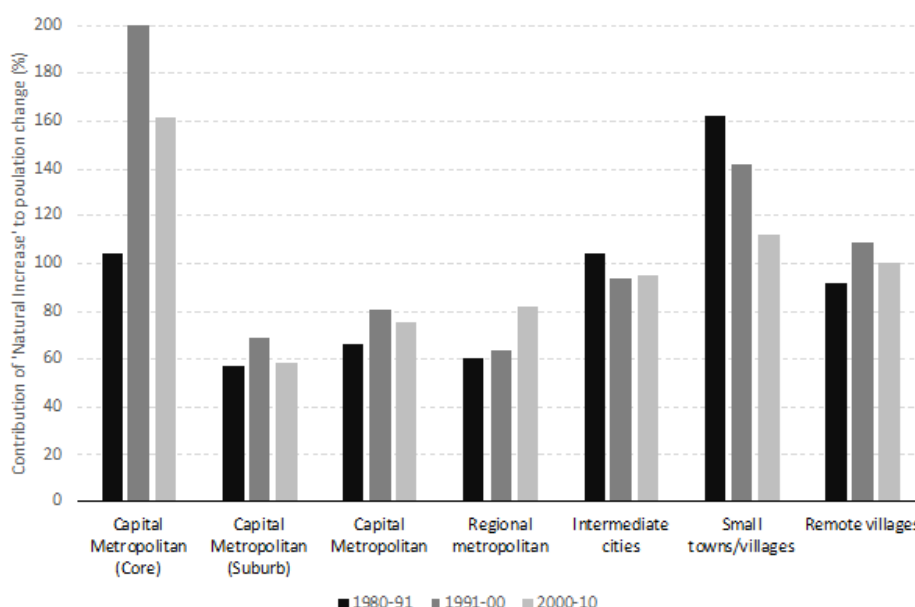
### Relative contributions of net migration and natural increase to population change

Geyer and Geyer (2015) attempted to analyse net migration flows for South Africa. However, in the absence of suitable data, they had to use the excess of local population change over national population change as a proxy for net migration. Of necessity, this meant assuming that net migration rates varied by location and natural increase rates did not. However, urban areas are known to typically experience lower fertility rates than rural areas, and they may experience either an ‘urban penalty’ or an ‘urban advantage’ in terms of death rates, depending on their stage of economic development (Allan et al., 2017; Lerch, 2019). Figure 6 reinforces this message: in Malaysia, the contribution of natural increase to the overall population changes ranged from 57% to 200%, depending on the time period and settlement type, with the corollary that the contribution of net migration to population change ranged from +43% to –100%.

As Geyer and Geyer (2015) noted, in a developing world context, natural increase can dominate the overall population change, which is the case in Malaysia. In all areas and at all times, natural increase contributed more than 50% of the observed population change. This meant that urbanisation, in the sense of growth in settlement size, persisted even in urban areas that had significant net migration out-flows, such as the capital metropolitan core. One of the main reasons for this was population momentum. Although fertility in Malaysia has steadily dropped since the 1960s, the number of women of childbearing age increased as fertility rates remained above the replacement level until 2012,



despite starting to decline in 2013 (Department of Statistics Malaysia, 2021). According to Blue and Espenshade (2011), for countries still in the process of demographic transition, population momentum can significantly impact population growth. This contrasts with the limited influence of population momentum on countries that have completed the demographic transition and have both low fertility rates and an ageing population (Andreev, Kirill; Kantorová, Vladimira; Bongaarts, 2013). In addition, a major increase in life expectancy arising from improved nutrition, increasing numbers of preventive health programs, and better access to curative medicine has also influenced the rate of natural increase (Hirschman, 1980).



**Figure 6:** Natural increase by Settlement Type, 1980-2010

Three other important findings are evident from Figure 6. First, from 2000 to 2010, natural increase in metropolitan cities (the capital and regional metropolitan areas) contributed less to population change than to other settlement types. Second, without net out-migration, population growth in the capital metropolitan core and the small towns/villages would have been even greater. Third, net migration had a minimal influence on population change in intermediate-sized cities and remote villages.

## **DISCUSSION AND CONCLUSION**

From the perspective of demographic urbanisation theory, Malaysia between 1980 and 2010 was firmly located in the urbanisation stage due to the dominance of large net inflows into the largest city, i.e., the capital metropolitan area. It is unclear whether this indicates that the country will experience polarisation reversal or counterurbanisation in the future. The continuous urban sprawl and rapid growth of urban development in the capital metropolitan area (e.g., large-scale projects such as new townships and high-speed rail lines) may distort the deconcentration process and pressure the Malaysian government to devote more expenditure to housing, infrastructure, and amenities in that city, thus helping to maintain its primacy. The Malaysian government has plans to balance the population across the regions (e.g., through rural and regional settlement schemes and the establishment of educational institutions far from metropolitan cities to stimulate growth in other areas).

Due to limits on government intervention, Malaysia in the future may look more like a standard developing country in terms of its urbanisation pathway. In India, for example, the change of the urbanisation pattern into polarisation reversal was mainly due to the effectiveness of various programs and policies during the post-independence period that aimed to foster balanced settlement sizes and population growth. One of these policies limited the concentration in large cities by encouraging concentration in other cities through infrastructural development and the establishment of transportation networks (Mookherjee & Geyer, 2011; Seto, 2011). However, the level of government intervention is low in India, which is similar to Malaysia, where all the programs and policies introduced are designed to encourage rather than force the population to live in other cities or rural areas. In contrast, the level of government intervention in China is stricter than in India and Malaysia. For example, Jain et al. (2013) argued that in India, the inadequate physical infrastructure and lack of institutional capacity to decentralise might lead the country to re-urbanise instead of counterurbanise. It remains unclear whether counterurbanisation in Malaysia will be similarly hampered.

Kontuly and Dearden (2003) suggested that the application of differential urbanisation theory in the future should incorporate analyses of not only overall population change but also the demographic components (natural increase and migration) contributing to this change. We believe that this is the first paper to fully take up this challenge. Based on the evidence presented here, in developing country contexts such as Malaysia, natural increase and migration are mutually complementary, with natural increase dominating the spatial redistribution of population and the urbanisation process. This contrasts with the situation in more industrialised countries that have already fully concluded their demographic transition and where migration rather than natural increase is the key driver of population change at the local level. Our results also show that the

relative contributions of natural increase and migration to the overall population change vary by settlement type, highlighting the need to avoid (where possible) the assumption of a spatially invariant relationship between these two aspects of population growth.

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## **SOCIAL IMPACT OF SOCIAL DISTANCING ON RESIDENTS OF LOW-COST APARTMENTS DURING THE CONDITIONAL MOVEMENT CONTROL ORDER (CMCO) IN SELANGOR, MALAYSIA**

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### **Abstract**

The spread of the coronavirus since the end of 2019 turned the pandemic into the main global health challenge. One preventative measure has been social distancing, which requires physical distance to be maintained between people who are not members of the same household. The implementation of social distancing has impacted many aspects of daily life, especially learning, working, physical movement, and sports/recreational activities. In 2021, a study was conducted among residents of a low-cost apartment complex in Selangor, Malaysia to examine the social impacts of social distancing. Analysis of the data collected from a questionnaire survey revealed that for most respondents, social distancing affected the performance of their daily activities in most places. Of the seven (7) types of social activities examined, family life and neighbourhood/community relationships were less negatively affected in terms of quality of life. Meanwhile, their quality of life was reduced, especially in relation to sports/recreational activities and transportation/physical movement. Lifestyle changes or the new normal for the purpose of implementing social distancing for public/social activities should be studied further to reduce the negative social impact of this measure.

**Keywords:** association; COVID-19; impact; quality of life; social distancing

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## **INTRODUCTION**

COVID-19 broke out in China at the end of 2019, since when it has become a global health challenge affecting all countries, including Malaysia (Shah et al., 2020). If it is impossible to eradicate the coronavirus, it may be possible to limit its impact by reducing the number of infected people. Social distancing has been one of the preventative measures used to reduce interactions between people and prevent the spread of the disease. This is a common practice that has been employed for generations to mitigate the spread of a virus or contagion by restricting its rate of reproduction among communities. In the battle against the spread of the coronavirus, a critical strategy has been the implementation of social distancing policies, which ensure physical distance is maintained between individuals.

However, due to social distancing and the movement control order, the behaviours and social life of individuals changed due to the sudden limits imposed by governments to maintain security. These included different levels of lockdown, movement restrictions, social gathering restrictions, limited outdoor activities, and school suspensions; in Malaysia, these started in March 2020. This new normal was not only applicable in Malaysia as it was universal. Based on previous research, introducing social distancing to prevent infection can have unintended consequences (Miller, 2020).

This paper aims to analyse the impact of social distancing, with a social focus on the quality of life of a community living in low-cost apartments. The study focuses on how social distancing affected the community, based on the residents' perceptions of their experience of practising social distancing in their daily life.

## **LITERATURE REVIEW**

Social distancing has been described by the Centers for Disease Control and Prevention (CDC) as a series of methods for reducing the regularity and nearness of contact between people to decrease the risk of a disease spreading. The WHO described social distancing as "keeping at least the length of an arm away from others and minimising meetings". Combined with good respiratory hygiene and handwashing, this has been calculated as the most effective way to minimise or suspend a pandemic (Jadhav & Anchan, 2020). According to the Santa Clara County Public Health Department (Benharzallah, 2020), social distancing refers to the efforts of public health professionals to prevent or limit the spread of a highly contagious disease. Health officials may be legally permitted to employ social distancing practices. However, this measure would have a major impact on the community. Thus, any decision to practise social distancing measures would need to be coordinated with local agencies, such as local government, police departments, and schools, as well as the state and federal governments.

In most countries, including Malaysia, social distancing measures have involved the prohibition of public gatherings; crowd avoidance; the closing of all non-essential stores, workplaces, and services; the advice to keep one to two metres away from others; holding meetings via video conferencing and no handshaking, among others. Social distancing standards include a seven- to 14-day quarantine period for persons who show symptoms of COVID-19 or test positive for it (Australian Government Department of Health, 2020; CDC, 2020; Williams et al., 2020). These measures have been effective in the past and currently, with Wuhan being able to limit the spread of the disease by following these practices in 2020 (Aslam, 2020).

However, social distancing impacted social life and quality of life. The social impact included the changes in value systems, individual behaviour, family structures, relationships, collective lifestyles, safety levels, social well-being, moral conditions, community organisations, creativity, education, opportunities, employment, social welfare, and the chance of life (McCombes et al., 2015; Butcher et al., 2015; Nzeadibe et al., 2015). Meanwhile, quality of life (OoL) can be defined as a social welfare component that covers all the important aspects of human life, ranging from personal advances, nutrition, shelter, health, education, security, social stability, recreation, physical environment, transportation, arts, and the economy (Ling et al., 2021; Ling et al., 2018; Nurul Shakila et al., 2018). These aspects of social life or quality of life are important because they affect happiness levels (Ling et al., 2015). Social impacts are always measured by utilising perception-based participatory methods. Impacts are assessed by societal values and understanding the individual (Ling et al., 2017).

The social impacts of COVID-19 prevention measures - including social distancing - have been widely reported since 2020. Social distancing due to the COVID-19 pandemic has affected not only the national economy but also various social aspects of the population, including the 40% of households in the lowest income bracket (Thinagar et al., 2021). Compared to previously, these communities experienced changes in their daily lifestyle, such as in employment (which potentially affected income and expenditure), health, education, safety welfare, religious activities, and social relationships. During the COVID-19 pandemic, social distancing led to intensified psychological distress related to relationship vulnerability and insecurity (Khan et al., 2021).

Lim (2020) has shown that the COVID-19 pandemic unprecedentedly reshaped family relationships and forced many to live physically closer to their families. On other occasions, people lived further from other members of their family or community due to the lockdown or social distancing measures (Ahmed et al., 2020).

A person's risk might be heightened by other factors, such as homelessness, disabilities, old age, or mental health issues. Violence is more likely



to occur when families are trapped at home and experiencing extreme stress and frustration. In the poorest areas in particular, learners who have no access to digital learning resources or who lack the resilience and dedication to learn independently have been found to be at risk of falling behind (Schleicher, 2020).

In terms of the economy and employment, the effects of COVID-19 on the Vietnamese population, for instance, have resulted in a high rate of household income loss, as well as impairment in some areas of quality of life (Tran et al., 2020). In this context, without government intervention, it has been argued that the severe poverty rate among poor households would triple (Fisher et al., 2020).

Besides the negative impacts, some positive impacts of social distancing and the effort to prevent COVID-19 have been observed. For instance, a study in China (Zhang & Ma, 2020) showed that the majority of the participants said they received more support from friends (64.6%) and family members (63.9%) after the pandemic began. The majority had improved their common emotions in regard to family members (57.8%), shared feelings with others while feeling unhappy (62.4%), and felt compassion for their family members' feelings (77.9%). Besides, more than half of the participants (69.2%) indicated that work-related tension had not risen since the pandemic began. Furthermore, 76.8% reported that the pandemic had not caused them to feel increased financial stress. A total of 74.5% of the participants said they did not feel more stressed at home. However, the COVID-19 pandemic had made 52.1% of the participants terrified and apprehensive.

Based on the previous research, the impacts of social distancing or the new normal have varied across different countries or communities. Due to the lack of research on the impact of social distancing on the quality of life among Malaysian low-cost housing communities, the current study was conducted to examine and understand the impacts of social distancing on the quality of life of a low-cost housing community.

## **METHODOLOGY AND CASE STUDY**

To examine the social impact of social distancing during the Conditional Movement Control Order (CMCO) period on those living in low-cost apartments, Fiona Apartment was chosen for the case study (Figures 1 and 2). Fiona Apartment is a leasehold apartment complex in Taman Samudra, Batu Caves. Batu Caves is a township in Gombak district, Selangor state, where the well-known Batu Caves Temple is located. This low-cost apartment complex is relatively close to Kuala Lumpur and has a variety of amenities. It comprises four five-storey blocks with a total of 400 units. On average, every unit has a gross built-up area of 614 square feet. The apartment boundary contains a playground, a public hall, a *surau*, and parking lots.

The location is near the city and the housing is compact (1.24 hectares) with small common facilities, for the residents to practise social distancing might have involved greater challenges than those in low-density landed housing would have experienced (Figure 1). Thus, the social impact of social distancing in an urban low-cost apartment complex located near the city was chosen as the topic of this research.



**Figure 1:** The buildings and small playground in the study area.

The impacts of social distancing covered not only the activities within the apartment complex boundary (including the common facilities) but also the residents' activities outside the boundary (i.e., outside the study area) such as in commercial areas, schools, and workplaces, as well as concerning transportation. The study of the social impacts of social distancing covered the following aspects:

- Ability of residents to practise social distancing
- Effects on performance of daily activities
- Impact on quality of life due to social distancing
- Changes in quality of life due to social distancing

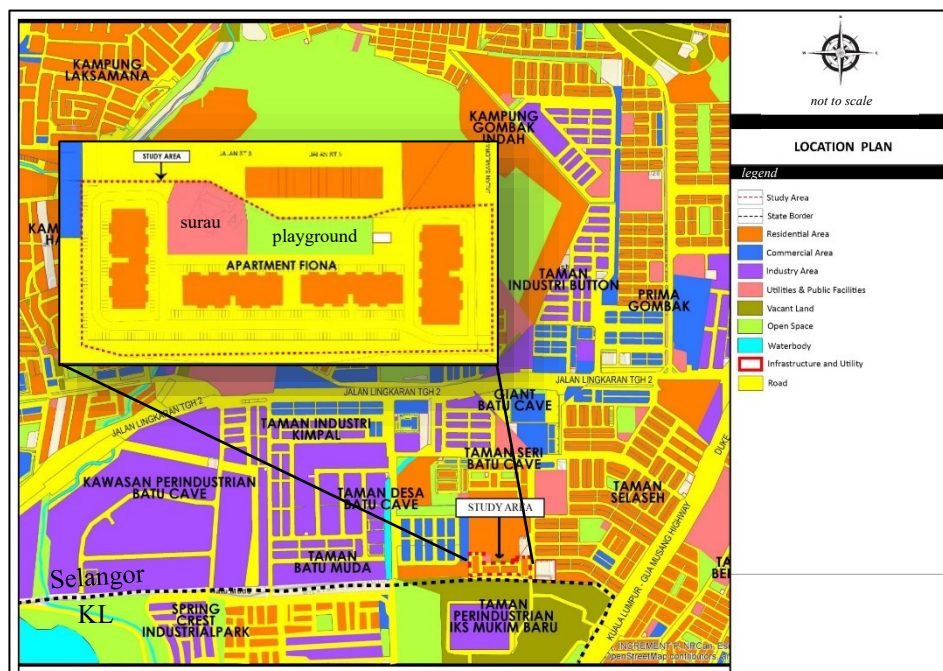


Figure 2: The study area and the location.

On 29 and 30 May 2021 (a Saturday and Sunday), immediately before the CMCO ended, the questionnaire survey was undertaken by visiting door-to-door and distributing the questionnaire survey forms around the common facilities. A total of 30 respondents successfully answered the questionnaire survey form within two days. The chosen respondents were residents of Fiona Apartment. The questionnaire survey ceased due to the full lockdown (MCO 3.0) imposed on 1 June 2021. As per the Central Limit Theorem, a sufficiently large sample size is usually not less than 30 (LaMorte, 2016). Table 1 shows the background of the respondents.

Table 1: Background of respondents.

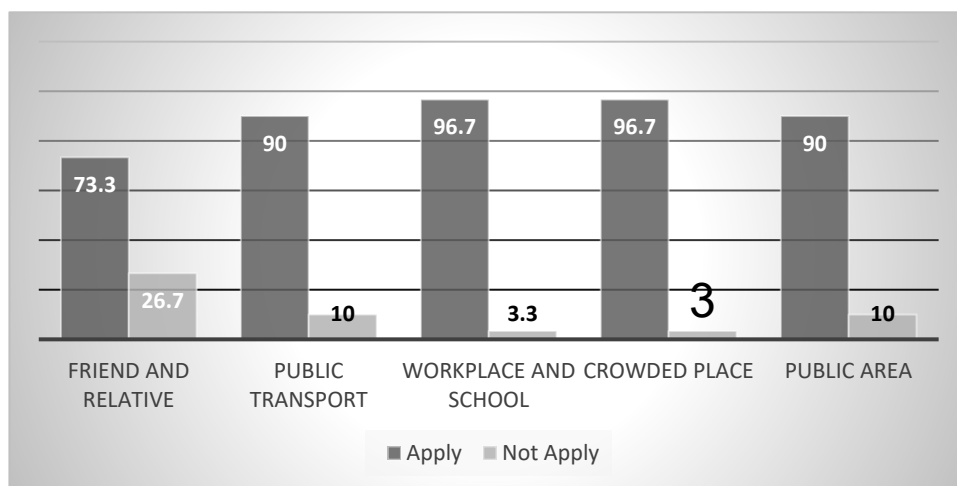
Variables	Percentage (%)
<b>Gender</b>	
Male	60.0
Female	40.0
<b>Race</b>	
Malay	73.3
Chinese	10.0
Indian	16.7
<b>Marital status</b>	

Married	53.0
Single	47.0
<b>Age group</b>	
17 years old & below	6.7
18-29 years old	43.3
30-39 years old	13.3
40-49 years old	23.3
50-59 years old	10.0
60 years old & above	3.3
<b>Employment</b>	
Government sector	10.0
Private sector	23.3
Self-employed	6.7
Part-time worker	13.3
Housewife	13.3
Retired	6.7
Student	20.0
Unemployed	6.7

## **RESULTS AND DISCUSSION**

### **Ability to practise social distancing**

Among the five (5) public activities - using public transportation, activities at the workplace or school, activities in a public area, activities in other crowded places, and meeting with friends and relatives - most respondents claimed to practise social distancing (Figure 3). However, some respondents found it difficult to do so. Based on the questionnaire survey, 26.7% of the respondents felt that social distancing was rarely practised during meetings with their friends and relatives (social activities). Furthermore, it was also difficult for 10% of the respondents to practise social distancing when using public transportation as well as in public areas. Public places and public transportation are sometimes crowded, especially during peak hours. However, most people easily maintained social distancing at workplaces or schools, as well as in other crowded places.

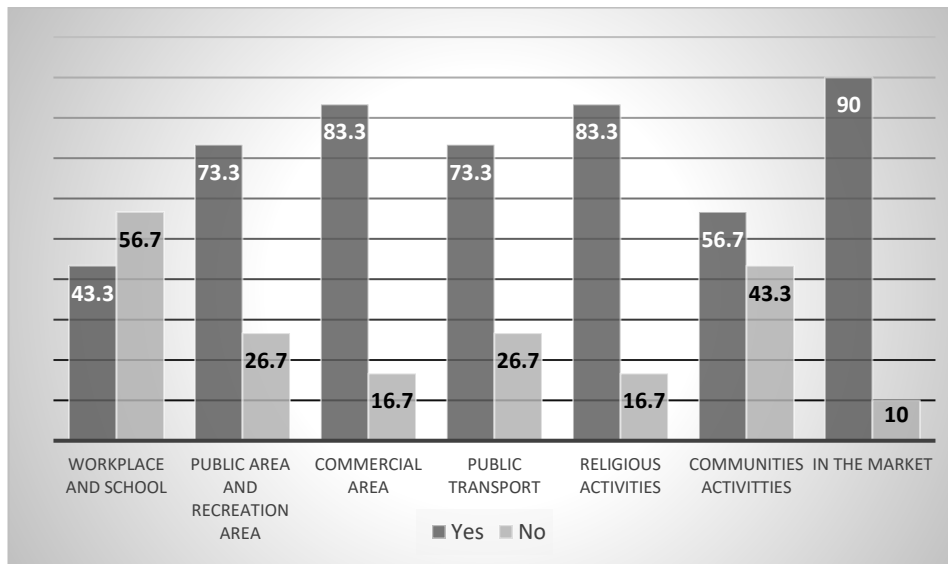


**Figure 3:** Percentage of respondents practising social distancing.

### Effects on performance of daily activities

The questionnaire survey revealed that most respondents (56.7% - 90.0%) were affected by social distancing in terms of the ways they performed their daily activities, except in schools or workplaces (Figure 4). The daily activities of most respondents were affected by social distancing for the following reasons:

- a. Maintaining social distancing reduced the capacity of a building. Most respondents had to wait a long time before being allowed to go to various places, such as markets, commercial areas, and public facilities, as well as use public transport.
- b. Maintaining social distancing and reducing the capacity of a building/place mean that most respondents were unable to perform their religious activities or prayers in a place of worship, such as a mosque.



**Figure 4:** Percentage of respondents who felt affected by social distancing when performing daily activities during the CMCO period.

However, most respondents (56.7%) were unaffected by social distancing in schools or workplaces, possibly because the majority of the respondents worked or studied with little social contact. However, 43.3% of the respondents felt that they were affected by social distancing when working or learning.

Examining the association between educational level and the impact of social distancing, those with higher educational levels (i.e., a diploma or degree) were generally found to be unaffected by these measures at their workplaces (Table 2). Meanwhile, among those with lower educational levels, the nature of their work was frequently affected by social distancing. Among those in the under-29 age group (often students or new graduates), most were unaffected at their school or workplace (Table 3). There was strong evidence of an association between educational level and the feeling of being affected by social distancing in schools or workplaces (Chi-squared = 11.616,  $p < 0.05$ ). There was no significant association between age group and the feeling of being affected by social distancing in schools or workplaces (Chi-squared = 7.434,  $p > 0.1$ ).

**Table 2:** Percentage of respondents who felt affected at school or the workplace due to social distancing, by educational level.

Educational level	Affected (%)	Not affected (%)
Primary School	100.0	0.0
PMR	50.0	50.0
SPM	35.7	64.3
STPM/ certificate	100.0	0.0
Diploma	20.0	80.0
Degree	0.0	100.0
TOTAL	43.3	56.7

**Table 3:** Percentage of respondents who felt affected at school or the workplace due to social distancing, by age group.

Age group	Affected (%)	Not affected (%)
17 years and below	100.0	0.0
18 – 29 years	38.5	61.5
30 – 39 years	25.0	75.0
40 – 49 years	57.1	42.9
50 – 59 years	0.0	100.0
60 years and above	100.0	0.0
TOTAL	43.3	56.7

Around 43% felt that their community activities were unaffected by social distancing. The respondent's age group was associated with the effects of these measures, with Chi-squared = 9.705 and  $p = 0.084$ . This showed that the younger generations (29 years old and below) generally felt their community activities had not been impacted, whereas those above 30 frequently felt such an impact (Table 4).

**Table 4:** Percentage of respondents who felt community activities were affected by social distancing, by age group.

Age group	Affected (%)	Not affected (%)
17 years and below	50.0	50.0
18 – 29 years	30.8	69.2
30 – 39 years	100.0	0.0
40 – 49 years	57.1	42.9
50 – 59 years	100.0	0.0
60 years and above	100.0	0.0
TOTAL	43.3	56.7

### Impact on quality of life due to social distancing

As Figure 5 illustrates, the study found that in general, quality of life levels were reduced following the implementation of social distancing in daily life. Before social distancing began, around one-third of the respondents felt they had a very high quality of life, and another one-third felt they had a moderate-level quality of life. However, after practising social distancing, most respondents (43.3%) felt that they were suffering a poor quality of life. Meanwhile, none felt that their quality of life was very high.

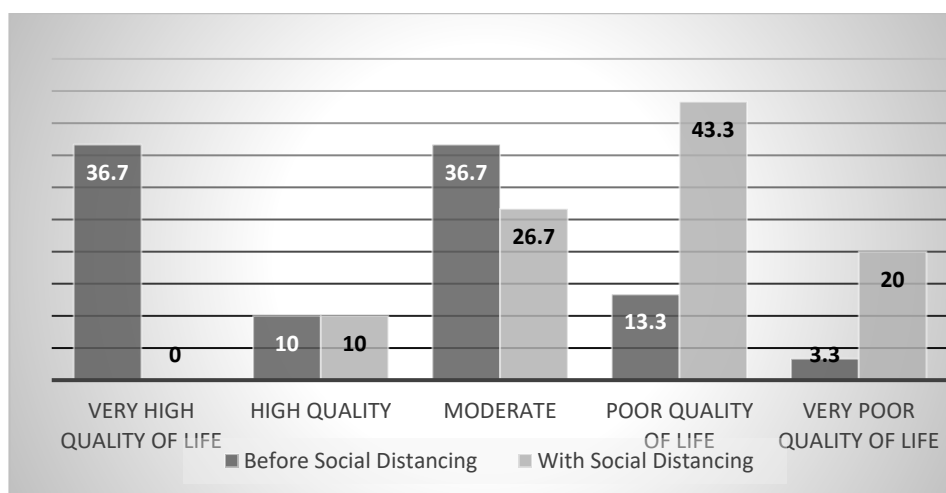


Figure 5: Quality of life levels before and after social distancing measures, by percentage of respondents.

### Changes in quality of life due to social distancing

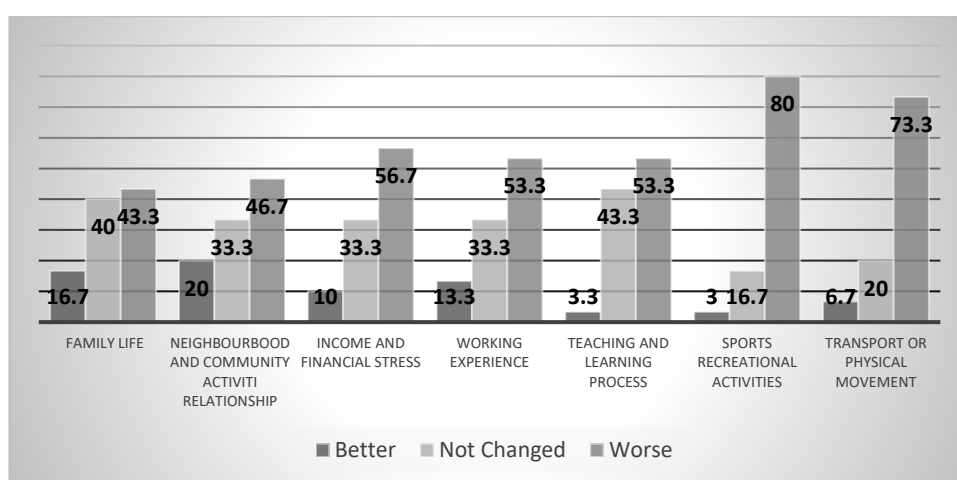
Examining the changes in quality of life, seven (7) variables were chosen, as shown in Figure 6. Most respondents felt that their quality-of-life level had been impaired after practising social distancing; this applied to all seven (7) types of social activities (Figure 6). Of these seven (7) activities, family life and neighbourhood/community relationships were less negatively affected in terms of the quality of life. Fewer than half of the respondents felt that due to social distancing, their quality of life was worse in relation to their family life and neighbourhood/community relationships. This might be due to the role played by social media in maintaining family life or community relationships, even when physical distance between people was being maintained.

However, in terms of the economic/financial aspect, work experience, and teaching/learning, more than half of the respondents felt their quality of life had worsened (Figure 6). This shows that teleconferencing and other online applications still cannot effectively replace the physical contact generally



involved in all economic, work, and teaching/learning activities. For example, some people lost their job or business. Thus, the quality of life was worse in regard to these aspects, which included financial stress.

The worst-affected aspects were sports/recreational activities and transport/physical movement. These two aspects of physical activities were greatly affected by social distancing. Around 73% to 80% of the respondents felt that social distancing had caused their quality of life to deteriorate in regard to transport/physical movement and sports/recreational activities (Figure 6).



**Figure 6:** Changes in quality of life during the CMCO period, by percentage of respondents.

In terms of the aspect of work experience as reference, neither age group nor educational level affected the changes in quality of life due to social distancing. Most respondents in all age groups and at all educational levels felt that their quality of life had worsened due to social distancing, except those of 50 years old and above (Table 5) and those with diplomas (Table 6).

**Table 5:** Changes in quality of life due to social distancing in relation to work experience, by percentage of respondents according to age group.

Age group	Better (%)	Not changed (%)	Worse	Total
17 years and below	0.0	50.0	50.0	6.7
18 – 29 years	30.8	23.1	46.2	43.3
30 – 39 years	0.0	25.0	75.0	13.3
40 – 49 years	0.0	28.6	71.4	23.3
50 – 59 years	0.0	66.7	33.3	10.0

60 years and above	0.0	100.0	0.0	3.3
TOTAL	13.3	33.3	53.3	100.0

**Table 6:** Changes in quality of life due to social distancing in relation to work experience, by percentage of respondents according to educational level.

Age group	Better (%)	Not changed (%)	Worse	Total
Primary School	0.0	0.0	100.0	3.3
PMR	0.0	50.0	50.0	6.7
SPM	21.4	35.7	42.9	46.7
STPM/certificate	0.0	0.0	100.0	16.7
Diploma	0.0	80.0	20.0	16.7
Degree	33.3	0.0	66.7	10.0
TOTAL	13.3	33.3	53.3	100.0

## CONCLUSIONS

Social distancing was generally acceptable and could be practised by respondents in the low-cost housing area. However, it was harder to practise when meeting friends and relatives, on public transportation, as well as in public areas. Nevertheless, the daily activities of most respondents (56.7% - 90.0%) were affected by social distancing in most places except schools and workplaces. Among the seven (7) types of social activities, family life and neighbourhood/community relationships were less negatively affected by social distancing with regard to the quality of life. Apart from educational level and age, the socio-economic background factors of the respondents were not significantly associated with the social impact of social distancing or changes to the quality of life. For instance, the social impact at schools/workplaces was associated with the educational level of the respondents.

To conclude, the implementation of social distancing as one of the measures to control the outbreak of COVID-19 was generally practicable among the respondents in the low-cost apartment complex (the study area). However, social distancing was hard to practise when meeting friends and relatives. The social impact was a concern since social distancing negatively affected the social life of the respondents. Meanwhile, the quality of life was reduced, especially in relation to sports/recreational activities and transportation/physical movement. The authors suggest that the lifestyle changes or the new normal caused by the implementation of social distancing for public/social activities should be studied further among different professions and different types of communities so that effective strategies can be constructed to reduce the negative social impact of this measure.

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## **THE IMPACT OF THE MOVEMENT CONTROL ORDER (MCO) ON TYPE OF COMMERCIAL ACTIVITIES IN MUAR TOWN, JOHOR**

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### **Abstract**

The COVID-19 pandemic has changed human nature. The Malaysian government declared the Movement Control Order as a measure to control the spread of COVID-19 with various restrictions. The Movement Control Order has affected daily routines as well as commercial activities. Therefore, the study will focus on the impact of movement control orders during the COVID-19 pandemic on the operations, supply of materials and products, as well as finances of commercial activities at a district level. The town of Muar, Johor, has been identified as the commercial area for this study. The data collection was accomplished by a questionnaire survey and by using convenience sampling with 100 respondents answering the questionnaire. A cross-table analysis and a Pearson's chi-squared test analysis were used to examine the Movement Control Order's implications on commercial activities' operations, supply of materials and products, and finances. The findings indicated that the Movement Control Order had a substantial impact on commercial activities. The study concluded that cash flow for survival needs critical attention due to this unprecedented outbreak, which led to the economic downturn. It is recommended that the government offer training courses on digital marketing and e-commerce to boost commercial activities as part of a new business strategy and financial management plan, particularly for new businesses at the district level.

**Keywords:** Movement Control Order, Commercial Activities, Operation, Material and Product, Finances

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## **INTRODUCTION**

At the end of 2019, the world was shocked by the existence of an infectious disease that is extremely dangerous to human health. Coronavirus disease 2019 (COVID-19) contributes to a severe illness. This virus might cause respiratory illnesses ranging from mild disease to severe disease and death. Meanwhile, some people are infected with the virus and never develop any symptoms. The disease has a significant effect on the entire world, particularly in countries with high-density populations. It has also affected the economic, social, political, and cultural situations of every country. Basically, for the economy, the effect is felt when a nation's government does not have the financial capability to protect the country's operations during quarantine and most of the commercial activities and others related to the economic sector are unable to operate. The COVID-19 pandemic has a significant impact on commercial activities by halting business operations to prevent the spread of the virus (Gregurec *et al.*, 2021). This has resulted in lockdowns, decreased consumption, community closures, and business closures.

## **RESEARCH BACKGROUND**

The SARS-CoV-2 virus causes Coronavirus Illness (COVID-19), an infectious disease. Whenever an infected person coughs, sneezes, coughs, speaks, or breathes, the virus spreads in microscopic liquid particles from their mouth or nose. (World Health Organization, 2020). The Malaysian federal government implemented and enacted the Movement Control Order as a set of global quarantine and sanitary measures in response to the COVID-19 pandemic that began in the country on 18 March 2020 (Hassan, 2021).

The first phase of the Movement Control Order began on March 18 and ended on May 12, having four phases spread over two months. Massive movements and gatherings were prohibited throughout the country during the MCO. To implement this prohibition, all places of commercial establishment had to be closed except supermarkets, public markets, food stores, and convenience stores offering daily essentials (New Straits Time, 2020). There have been various movement control orders implemented from March 2020 to the current situation. The various movement control orders have been taken according to a variety of steps to control and break the chains of virus spread. All phases adopted by the Malaysian government have distinct functions and resultant effects.

According to Omar *et al.* (2020), there was an impact during the Movement Control Order on SME businesses, and they needed a survival strategy to sustain their operation. During the global pandemic, businesses have encountered a variety of issues. How they dealt with these issues affected their ability to recover as well as their chances of surviving this crisis.

According to the Department of Statistics Malaysia (2021), 53.4% of companies or business firms can only survive for 1 to 2 months if they provide full-time or half-pay leave to employees. Based on the research on the impact of the movement control order COVID-19 on commercial activities, it is determined that the COVID-19 pandemic has the biggest impact on all human activities. For commercial and business activities, two main issues have a significant impact, especially for small and medium-sized entrepreneurs. As indicated by Omar et al. (2020), the impacts of MCO on commercial activities are classified into two, which are operational and financial problems. For operation problems, the issues are divided into operation disruption, supply chain disruption, and foresight of the future business direction. Meanwhile, the financial problems and issues are divided into three categories: cash flow imbalance, access to stimulus packages, and bankruptcy risk.

During the first Movement Control Order, all commercial organisations were closed, except for those that fell under the category of “essential services.” Any activity or process in the supply chain involving food, water, energy, communication and internet, security and defence, solid waste and public cleansing management and sewerage, healthcare and medical, including dietary supplements, banking and finance, hotels and accommodation, was included in the “essential services”. Besides that, Movement Control Order COVID-19 also caused supply chain disruption, as the world economy was also impacted by significant local and cross-border movement controls, which included the closure of local, national, and international commercial entities (Smith-Bingham & Hariharan, 2020). As a result, millions of workers have been laid off, and businesses were short on supplies and were unable to recover.

Financial problems were one of the main issues faced by owners of small and medium enterprises (SMEs) during the COVID-19 pandemic. As stated in the research by Afrina (2021), SMEs contribute 35% of the Malaysian GDP (Gross Domestic Product) and 70% of the jobs in the entire market. The lockdown had a significant impact on SMEs, leaving many to experience financial difficulties. In addition, during the two-month lockdown, manufacturers that contributed to Malaysia’s export income were ordered to stop operating, leading to an economic decline of 8.3%, against a negative 1.7% growth in 2019. The main cause of financial problems among small and medium enterprises (SMEs) during the COVID-19 pandemic was a cash flow imbalance. Cash flow played an important role in sustaining businesses during the COVID-19 pandemic. Based on a study done by the Department of Statistics Malaysia in 2021, the duration of survival for companies or business firms was less than 2 months.



Three main factors affected commercial activities during all phases of the MCO, namely operations; income and revenues; and demand and supply for commercial activities. These factors determine the survival and sustainability of a commercial activity, especially during such a difficult period. All these problems have affected a small town such as Muar since there were a lot of commercial activities, mostly operated by small and medium-sized entrepreneurs. During the spread of COVID-19, a lot of restrictions have been implemented by the government to control the virus' spread, including the operational limitations of commercial activities. The Movement Control Order had a significant impact on their operations and had serious repercussions, including bankruptcy and others.

There have been many studies on the influence of movement control orders on commercial activities in a main city centre or a state capital (Young, 2021; Inoue & Todo, 2020), but there has been no study on the effect of movement control orders on commercial activities at the district level where the business activities' main method of selling is direct selling to customers. Therefore, it is very important to study the influence of movement control orders on commercial areas, especially at the district level. The present study has been conducted on the commercial activities in Muar, Johor.

This research also determined whether the implementation of the Movement Control Order would have an impact on commercial activities as well as the biggest challenge faced by business owners during the COVID-19 pandemic. Therefore, the study focused on the impact of movement control orders during the COVID-19 pandemic on the operational, material, production, and financial aspects of commercial activities in Muar, Johor.

## **COMMERCIAL ACTIVITIES DURING THE MOVEMENT CONTROL ORDER**

### ***Operation of Commercial Activities***

During the first Movement Control Order in Mac 2020, Majlis Keselamatan Negara (National Security Council) decided to close all economic sectors except for essential services. The essential services designated for all businesses, such as supermarkets and restaurants, including food delivery services, could only be operated during the day and closed at night. The announcement of the Conditional Movement Control Order stipulated that economic sectors and activities would be permitted to operate under stringent standard operating procedures (SOPs). Businesses and the general public must maintain social distance, record customers' names and telephone numbers, and use the MySejahtera application.

The duration of commercial activities for the essential services had been extended from the day until midnight, but restaurants could still operate for take-aways only until the announcement of the Recovery Movement Control Order, at which time dine-in would be allowed. All economic sectors during Recovery Movement Control Orders were limited to 60% of their capacity for operation and management. Only fully vaccinated people were allowed to enter and operate commercial activities under the National Recovery Plan of August 2021. All of these restrictions and SOPs, which change regularly according to the phases of the Movement Control Order, have had an effect on commercial activities nationwide.

#### ***Income and Revenue of Commercial Activities***

Income refers to the consumption and saving opportunities gained by an entity within a specified timeframe, which is generally expressed in monetary terms. (Barr, 2004). During the COVID-19 pandemic, many restrictions have been implemented. As such, the implementation of phase 2 to phase 4 saw 67.8% of companies experiencing no sales or revenue (Department of Statistics, 2020). This situation also influenced the duration of survival for business activities.

This resulted in massive closures of companies, whereby only 35% of companies had been allowed to operate, while 49% operated partially from March to April 2020 (Department of Statistics, 2020). This period also saw a drop of 25% in revenue. According to Smita et al. (2020), there are discernible disparities in impact by firm size, with smaller enterprises more likely to remain closed for business, corroborating the view that the pandemic has had an uneven effect on smaller firms. This occurred because small businesses had more difficulties with their income than medium-sized and large businesses.

This shows that most businesses were facing a significant loss of revenue and income due to the restrictions following the implementation of the Movement Control Order. Owing to declining revenues and income, the majority of small commercial and business activities could not afford to bear the cost of their closures.

#### ***Demand and Supply of Materials and Products for Commercial Activities***

During the duration of the Movement Control Order, movement restrictions had an effect on the activities of each participant in the supply chain as a result of restricted interstate movements, buying centres only at fixed-premises shops, and operation hours, with some operators unable to conduct business at all. Markets with a high concentration of buyers were closed, including wholesale and night markets. Consequently, wholesalers, transporters, and small-scale merchants were temporarily excluded from the supply chain (Mohamed Arshad, 2020).

Disruptions in the supply chain impacted the sales and operations of the majority of businesses. In October 2020, over two-thirds of companies impacted by supply chain disruptions experienced difficulty in fulfilling a sales order. This circumstance forces some business owners to act by extending their supplier networks. In 2021, the majority of businesses saw a decrease in the demand for their products and a slight increase in order cancellations of up to 22% (Smita et al., 2021) due to the sudden implementation of Movement Control Orders 2.0 and 3.0 in that particular year. Commercial activities became more competitive, which was effective throughout the implementation of the Movement Control Order.

## RESEARCH METHODOLOGY

### *Case study: Town of Muar, Johor*

The town of Muar, Johor, was selected as the study area. Muar, or Bandar Maharani, is a historical town and the capital of the Muar District, Johor, Malaysia. The total number of commercial premises in the Muar District is 11,252 units of shops, concentrated in the City Centre and Sub-City Commercial areas, namely Bandar Maharani (Bandar Diraja), Bandar Universiti Pagoh, and Bukit Bakri. Based on Table 1, most commercial activities are dominated by distributive trade services such as retail, wholesale, and motor vehicle services (36.65%), followed by food and beverage services (27.84%). The lowest type of commercial premises is transportation and storage (0.16%).

**Table 1:** Type of Commercial Premises in the District of Muar

Type of Commercial Premises in Muar	Number of shops	Percentage
Distributive Trade	4,124	36.65
Food and Beverages	3,133	27.84
Professional	867	7.71
Transportation and Storage	18	0.16
Administration and Support	821	7.30
Information and Communication	608	5.40
Health and Social Work	260	2.31
Education	68	0.60
Accommodation	88	0.78
Arts, Entertainment, and Recreation	498	4.43
Real estate	47	0.42
Financial	150	1.33
Others	571	5.07
<b>Total</b>	<b>11,252</b>	<b>100.00</b>

*Source: Local Plan of the District Muar 2030*

The study area also focused on the commercial area in Mukim Bandar, which is the main town centre of the Muar district as the most dominant business area and a well-known administrative area. Muar town has been selected as the case study because it is where the main commercial activity in the district of Muar takes place.

### ***Questionnaire Survey and Respondent Sampling***

Accordingly, the units of a commercial building in the study area are divided into three categories. In addition, the group is stratified by the researcher randomly based on the three commercial types, which are retail, service, and wholesale. The questionnaire survey was carried out by adopting convenience sampling based on the overall total of commercial in the Town of Muar, which consists of 675 units of commercial premises. The respondents' sample size follows the small sample technique created by Morgan and Krijcie (Berawi, 2018). Due to the Movement Control Order situation, 242 respondents is considered a substantial number for the sample size.

Only 100 respondents answered the questionnaire survey. Under these special circumstances, the Central Limit Theorem has been applied. According to the Central Limit Theorem, a sample size of 30 is sufficient for this research because the t-distribution (sample distribution) approximates a normal distribution (Kim & Park, 2017). Therefore, the t-distribution is generally used instead of the z-distribution for large and small sizes. Hence, a total of 100 respondents is an adequate sampling size for this study. Of the 100 respondents, 89% are from retail and services, and the remainder is from wholesale. Table 2 shows the number of respondents according to the three groups of commercial activities:

**Table 2:** Number of Respondents According to the Type of Commercial Activities

<b>Type of Commercial Activities</b>	<b>Number of Respondents</b>
Services	47
Retail	42
Wholesale	15
Total	100

### ***Methods of Analysis***

The data was analysed using frequency, cross-tabulation, and correlation analysis using the IBM SPSS Statistics software. Cross-tabulation provides a way of analysing and comparing the results of one variable with those of another. Pearson's chi-squared test analysis is used to investigate the degree of association between variables.

In this research, the variables are business operations, supply of materials, and finances. Senthilnathan (2019) defines a Pearson's chi-squared test of association, that discover if there is a relationship between two categorical variables. The purpose of this analysis was to determine the impact of the Movement Control Order on type of commercial activities in Muar. The Pearson's chi-squared test analysis indicates the association toward the impact of the Movement Control Order on the type of commercial activities. The results and findings of the analysis are explained in the next section.

## RESULTS AND FINDINGS

### *Business Operations During the Movement Control Order*

Based on Table 3, 40 of the total respondents stated that they were allowed to operate during the implementation of the Movement Control Order, and 60 respondents stated that their business activities could not operate due to the non-essential nature of the business. Services, one of the allowable commercial activities, recorded the highest number due to the fact that most of the services commercials in the area of Muar Town are food and beverage. Retail had the highest rate of closure during the Movement Control Order, with 30 respondents stating that they could not continue operations because their businesses required physical services.

**Table 3:** Business Operations During the Movement Control Order according to The Type of Commercial Activities

Type of Commercial Activities	Business Operations During the Movement Control Order		Total
	Yes	No	
Services	21	26	47
Retail	12	30	42
Wholesale	7	4	11
Total	40	60	100

### *Business Operations and Cash Flow During the Movement Control Order*

Table 4 shows a cross-tabulation between business operations during the Movement Control Order and their cash flow to sustain the business. An overall total of 43 businesses stated that they had less than a month of cash flow to survive during the Movement Control Order. Even though 13 out of 43 businesses could operate during the Movement Control Order, they still could not sustain their survival for more than a month. Only seven businesses had a chance of surviving more than six months at the time. This demonstrates that a company's operations have a significant impact on its cash flow survival rate. If a business was allowed to operate, its cash flow survival rate would have been higher, and it would have been able to cover its operating costs.

**Table 4:** Business Operations and Cash Flow During the Movement Control Order

Cash Flow for Survival	Business Operations During the Movement Control Order		Total
	Yes	No	
Less than 1 month	13	30	43
1–3 months	18	19	37
4–5 months	5	8	13
6 months or more	4	3	7
Total	40	60	100

***Shortage of Materials and Products During the Movement Control Order***

During the implementation of the Movement Control Order, a total of 69 businesses had an interruption of supply, i.e., a shortage of materials, whereas 31 businesses had no problem with their materials or products. Out of 69 businesses that experienced a shortage of materials and products, 46 businesses could not operate during the Movement Control Order and the remaining 23 businesses had been operational despite facing supply disruptions of raw materials and products. Interestingly, 17 out of 31 businesses that did not have problems with supply shortages were allowed to operate. This indicates that most of the business activities in Muar Town experienced supply disruptions of products and raw materials. Their business operations were also affected by this matter during the Movement Control Order. If more business activities had been allowed to operate, they would have faced a lower shortage of raw materials and products.

**Table 5:** Business Operations and Shortage of Materials and Products During The Movement Control Order

Shortage of Materials and Products	Business Operations During the Movement Control Order		Total
	Yes	No	
Yes	23	46	69
No	17	14	31
Total	40	60	100

***The Association between Commercial Activities and Operations, Supply of Materials, and Finances During the Movement Control Order***

This study utilised Pearson’s chi-square test to determine the correlations between the business categories (retail, services, and wholesale) and their finances, supply of materials, and operations. This particular analysis was used because the present study is nonparametric in terms of category (Khatun, 2021).

Table 6 shows that the association between the type of business activity and finances, supply of materials, and operations are statistically significant, ranging from 0.963 to 1.558. At the 0.05 level of significance (2-tailed), Pearson's chi-squared test shows that all the categories have positive significance associated. The results indicate that the Movement Control Order has had a substantial impact on Muar's commercial activities in terms of their operations, supply of materials, and finances. The Pearson Chi-Square analysis confer with the cross-tabulation analysis that have been discuss based on Table 3, 4 and 5.

**Table 6:** Pearson Chi-Square Analysis Between Type of Commercial Activities and Operations, Supply of Materials, and Finances During the Movement Control Order

		Value	df	Asymp. Sig. (2 sided)
Type of Commercial Activities	Operations	1.126 <sup>a</sup>	1	0.002**
	Supply of Materials	1.558 <sup>b</sup>	1	0.002**
	Finances	0.963 <sup>c</sup>	3	0.005**

<sup>a</sup> 2 cells (50.0%) have an expected count of less than 5. The minimum expected count is 0.47.

<sup>b</sup> 4 cells (66.7%) have an expected count of less than 5. The minimum expected count is 0.41.

<sup>c</sup> 0 cell (0.0%) has an expected count of less than 5. The minimum expected count is 6.37

\*\* Correlation is significant at a level of 0.05 (2-tailed)

## DISCUSSION AND CONCLUSION

The discovery demonstrates that the implementation of the Movement Control Order has an impact on type of commercial activities especially on business operations, supply of materials, and finances. The majority of commercial activities impacted by the Movement Control Order are services, as they fall under the category of non-essential infrastructure (Table 3). According to Johnson et al. (2020), those employed in the services sector suffer the most as a result of the inability to operate during the Movement Control Order. Due to the shortage of materials and products, commercial activities were also unable to function normally (Table 5). This was due to the restrictions on interstate logistics and disabled commercial activities, which disrupted the supply chain for materials and products. Table 6 shows the association between type of commercial activities and operations. It demonstrates that the government-mandated SOPs for operations had an impact on commercial activities.

During the MCO, the SOPs, such as no dine-in customers, limited hours of operation, and a limited number of customers allowed inside a business establishment, did impact the operations of commercial activities in the town of Muar. Due to the pandemic's impact on businesses' sustainability, the cash flow of commercial activities has been a subject of concern. It was projected that more than half of the commercial activities would survive for less than three months (Table 4).

Due to the cessation of operations and rigorous adherence to normal operating procedures under a movement control order, commercial activities faced an inability to operate and survive the pandemic due to a lack of revenue. According to Rwafa-Ponela (2022), a similar situation has occurred in South Africa as a result of lockdowns. Numerous businesses were anticipated to liquidate or cease operations due to a lack of income. This provided additional evidence of the importance of operations, supply of materials, and finances to the commercial activities in the town of Muar during the Movement Control Order (Table 6). In conclusion, the Movement Control Order did impact the district-level commercial activities in Muar Town, particularly in terms of operations, supply of materials, and finances. Due to this unprecedented outbreak, which has caused an economic downturn, the cash flow for survival requires urgent attention.

There is a need for further government economic initiatives and a reorientation of business strategy. It is suggested that the government provide companies with training on digital marketing and e-commerce so that they can use as new business strategies and financial management plans, which is especially important for new district-level businesses. This is aligned with the current 12<sup>th</sup> Malaysia Plan on Advancing Digital Economy. The experience during the Movement Control Order and this recommendation could help the type commercial activities be well prepare and more sustainable if there is another outbreak of pandemic happening in the coming future.

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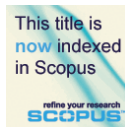
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## **THE CHALLENGES OF PUBLIC PARTICIPATION IN THE MALAYSIAN PLANNING SYSTEM**

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### **Abstract**

This study provides an overview of the development of Malaysia's planning system, particularly in relation to public participation. A case study of Malaysia is critical as this study highlights the challenges in planning practice, thereby presenting a critical reflection of planning experiences in response to a specific context. Specifically, this study aims to assess how the public participation process operates within the mechanisms of the planning system, including the challenges presented to the Malaysian planning practice. This study was conducted at Gasing Hill in the Federal Territory of Kuala Lumpur. Secondary data were gathered by performing an in-depth interview with 20 respondents. The findings revealed how planners deal with the public concerning the formation of the Gasing Hill case. The planners had been given the privilege to take decisions governing the consultative process. Thus, understanding the roles and responsibilities of planners is necessary if the practices that epitomise the ethos of participatory democracy in Malaysia are to be changed. This study adds to the growing literature that suggests the importance of public participation in shaping the future development of Malaysia.

**Keywords:** Public participation, urban planning, planning practice, decision-making, consultative process

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## **INTRODUCTION**

Malaysia has been experiencing rapid development since its independence in 1957, which has transformed its economic base from agriculture to industry. Malaysia's rapid industrialisation has driven population migration to major cities for employment opportunities and education, which has affected people's quality of life. Certainly, planning practice has a role in contributing, often directly, to the country's needs and aspirations, particularly in the decision-making process. The process of public participation is an important requirement of planning systems. Public contributions to planning processes tend to be near universally accepted in the literature (Pantić et al., 2021; Ploger, 2021). Specifically, the notion of participation has evolved as an essential practice in planning to encourage opportunities for social change (Conrad *et al.*, 2011; Huxley, 2013). This reflects the acceptance of 'participation' as a solution to certain issues in planning practice. Nevertheless, along with critical reflection on the importance of public participation, the influence of the public over decision-making and the underlying aims of the participation process can be questioned. Hence, this study pays significant attention to the Malaysian planning system to investigate how the public participation process operates within the mechanisms of the planning system, including the challenges presented to Malaysian planning practice.

## **LITERATURE REVIEW**

The Malaysian system of government is attributable to the British 'Westminster' model, with the three key branches of government: the legislature, the executive, and the judiciary. The obvious similarity is that both Malaysia and Britain have a monarch or supreme ruler as their Head of State. Under the monarchy, each of the key branches of government is represented at both the federal and state levels and the 'powers' guaranteed by the 1957 Federal Constitution.

The specific responsibilities of the federal and state governments are listed in the Ninth Schedule of the Federal Constitution; town planning matters are governed under the concurrent list, where the power is shared between the federal and state governments. Hence, both federal and state governments have the power to make laws relating to town and country planning; each state has control over its land and has power in the implementation process; the federal government has no executive functions and only acts in an advisory capacity to enforce its direction.

In order to coordinate the relationship between federal and state levels, National Councils are established at the federal level pursuant to the Federal Constitution of 1957. These include the National Economic Council, the National Land Council, the National Finance Council, and for matters relating to town and country planning, the National Council for Local Government and the National Physical Planning Council (NPPC). Prior to this, at the state level, the State

Planning Committee (SPC) was set up and chaired by the Chief Minister to supervise the planning activities within the state (Bruton, 2007). The functions of SPC included ensuring the effective administration and proper execution of town planning in the state.

The planning system in Malaysia adopted a ‘top-down’ approach starting at the federal level to the state and local authority levels (Manaf et al., 2022; Zanudin & Misnan, 2021). There are three types of local authorities in Malaysia: the city council, the municipal council and the district council. Accordingly, “the local authorities or the government performs obligatory, discretionary services and are the agents of development whose function is to provide non-profit-making services to the people, including various other mandatory services” (Maidin, 2012, p. 146). Regarding town and country planning, the local authority functions as the local planning authority whose responsibility is to “regulate, control and plan the development and use of all lands and buildings within its area” (section 6(1) (a), Town and Country Planning Act 1976). The local planning authority has the power to execute town and country planning functions as outlined in local plans. More importantly, the local planning authority must play a more effective role to ensure sustainable development by managing the urban system and its environment.

As the principal piece of the statute regulating town and country planning for the Malaysian Peninsular, the Town and Country Planning Act (1976) (the TCPA) highlights the opportunities for public participation processes to occur during the publicity stage of structure plans (Section 9), in local plan preparations (Section 12) and the course of the planning permission process (Section 21). Thus, a participatory process refers to the statutory procedure in the Malaysian planning system that involves various actors, such as planners, developers and non-governmental organisations (NGOs) in decision-making processes. The objective for public participation in the Malaysian planning process is to provide avenues for the public to contribute and have rights in the planning process that may affect their living environment as the result of a particular development.

The cooperation between all the key actors is considered essential in the planning process to reflect the values of public interest and “to ensure a democratic planning system that empowers the public to participate effectively in the process” (Maidin, 2011a, p. 149). In fact, in practice, public participation in Malaysia is conducted through consultations, which involved the public from the initial stage until the final stage “so that all parties were accountable for their action” (Nurudin *et al.*, 2015, p. 507).

In particular, the Malaysian planning system has stressed the importance of collective action in the planning process (*Manual Publisiti dan Penyertaan Awam*, 2009). However, according to Maidin (2012, p.29), “the

provisions of the Act [TCPA] merely provide for the objections and suggestions to be put forward, but there are no provisions as to whether these opinions are to be considered in the decision-making process". In this sense, the scene that the legal framework regulating the Malaysian planning system portrays some complexities and challenges in the participatory process. Furthermore, the question of a successful participatory process in the Malaysian planning system remains open-ended.

Understanding Arnstein's (1969) symbol of the 'ladder of participation', which is widely referred to in the planning literature as a tool may provide a basis for public participation analyses (Huxley, 2013; Quick & Bryson, 2022). Thus, it is plausible to turn to Arnstein's (1969) 'ladder of participation' to inform thinking that "suggests the provision of information and consultation" in planning practice (Bailey, 2010, p. 316). Significantly, discussions about participation engage widely with Arnstein's (1969) 'ladder of participation'. The ladder includes eight forms of 'participation': manipulation; therapy (non-participation); informing; consultation; placation (tokenism); partnership; delegating] power; and citizen control (citizen power), thereby indicating different levels of participation. Accordingly, the citizens' degree of power varies across different rungs (of the 'ladder'), policy arenas and contexts (Bailey, 2010). The levels of the ladder reflect the meaningfulness of participation from least to most (Lane, 2005).

Consequently, this research will add to the existing body of knowledge and positive impact on areas of planning practice and consultative process. The findings will yield feasible and practical approaches for a more effective engagement with participatory processes as an essential condition for the improvement of participatory democracy in Malaysia.

## **RESEARCH METHODOLOGY**

### **Study Area**

This research utilises a single case study that draws upon qualitative data given that it has "a finite number of people who might be interviewed [and] a finite number of documents to be reviewed" (Savin-Baden & Major, 2013, p. 154). The strategies used to select the case were based on 'critical case selection' that is suitable for maximising the information content from the selected case study (Flyvbjerg, 2001). In this sense, case study research can describe "the decision-making processes in urban planning and provide exemplars of what the research considers best practices" (Birch, 2012, p. 265). In line with the research objectives, the participants were selected according to their wide-ranging experience and expertise in the areas of the case study.

Gasing Hill or *Bukit Gasing* is a green sanctuary located at the border between the Federal Territory of Kuala Lumpur (hereafter referred to as Kuala

Lumpur) and Selangor. The total area of Gasing Hill is over 100 hectares, of which the Selangor side covers an area of approximately 34 hectares while the remaining area is on the Kuala Lumpur side. The site is divided into two local authorities, Kuala Lumpur City Hall and the Petaling Jaya Municipal Council (Selangor). The site of Gasing Hill was formerly a forest area that provided ‘green lungs’ for the cities of Kuala Lumpur and Petaling Jaya. It is also famously known by locals as Bukit Gasing Recreational Park and has hiking trails within its boundaries (Figure 1). Accordingly, the Petaling Jaya Municipal Council “had gazetted all the 34 hectares of the Bukit Gasing area under their jurisdiction as green belt reserve in 1961. The other 110 hectares under the Kuala Lumpur City Hall are yet to be gazetted” (Newsletter of the Malaysian Institute of Planners, August 2006, p. 7). Indeed, the gazetted area of Gasing Hill on the Selangor side is a very popular place for nature lovers and hikers.



**Figure 1:** Main entrance to Gasing Hill



**Figure 2:** Popular place for hikers

Nevertheless, with the rapid development, the areas have continued to experience much pressure on green and forest land to be converted into housing projects (Latiff, 2001). Notably, part of Gasing Hill has been gazetted as a forest reserve that needs to be protected. Due to several enabling factors, part of the site has been developed as a new development area known as Sanctuary Ridge Kuala Lumpur City and the Pantai Sentral Park project.

Despite the boundaries of Gasing Hill being divided into two local planning authorities, the process of public participation was adopted and encapsulated by both authorities, both of which also gave their assurance to safeguard the environment. However, the site was impacted drastically within months, due to land clearing activities such as the falling of many of its trees and substantial earthworks for land levelling. Ultimately, Gasing Hill continues to be eroded by environmental disasters, such as floods and landslides (The Star, 18 May 2013; New Straits Times, 2 February 2013).

### **In-depth interviews and Documents Analysis**

This study adopts an in-depth interviewing technique since it complements the case study approach. The interview questions were open-ended and focused on how planners and other interviewees react to the ongoing drive for public participation, including the value judgements utilised in the decision-making process. The in-depth interviews involved 20 participants that were knowledgeable in urban planning matters, especially in the selected case study, Gasing Hill (Yin, 2009).

The participants were contacted via email/phone with a brief description of the research, followed by an appointment with the date, time and location of the interview session. The interview sessions were conducted between April and July 2015, lasting for at least 30 minutes to 1 hour. Although the interview session was performed more than five years ago, the findings are still useful and remain relevant today. The interviews provided participants with an opportunity to respond freely and share their opinions and perspectives concerning conflict (Vries & Aalvanger, 2015). Sixteen of the interviews were audio-recorded with permission, while the remaining four were not recorded as requested by the participants for confidentiality reasons. Fifteen of the interview sessions were conducted in English, whereas the remaining five were conducted in the Malay language. Therefore, a translator was employed to translate the transcripts from Malay to English. All the transcripts were then transcribed by a professional transcriber to avoid researcher bias. This is also considered to be sufficient for preserving the details and the content of the interview transcripts (Charmaz, 2014).

Accordingly, the research used documents from secondary sources that were presented in their originally-printed forms. The relevant documents collected include; the Eleventh Malaysia Plan (2016-2020), the National Physical Plan, the Kuala Lumpur Structure Plan 2020, the Petaling Jaya Local Plan 1, the Town and Country Planning Act 1976 and newspapers that contain the details of the case. These documents are available from the Kuala Lumpur City Hall, Petaling Jaya Municipal Council, as well as electronically. Furthermore, the relevant documents from internet sources were obtained from the official government website and registered organisations. Thus, documents obtained via the internet were carefully used and treated (Yin, 2009).

### **Sampling of Respondents**

Purposeful sampling was selected as the most appropriate sampling technique to conduct the interviews. This was reflected by selecting participants with general knowledge of urban planning and experience with the phenomena under investigation. Other participants' inclusion criteria were willingness to participate, having the time to share the necessary information, and being

reflective, willing, and able to speak articulately about their experiences (Bryant & Charmaz, 2007).

Accordingly, four planners each from the Kuala Lumpur City Hall and the Petaling Jaya City Council (Selangor) were interviewed as they had dealt directly with the planning process in the case study selected. The approach focused on the practicality of planners’ activities and their experience in everyday situations when dealing with the public. This was ascertained by recording what occurred and how planners addressed the public in the planning system. According to De Roo and Porter (2007), for most planning issues, the crucial actors to be consulted are likely to be governmental bodies or third parties strongly affiliated with governmental policy. Therefore, it was pertinent to interview other actors who had also been affected by the planning and decision-making process. Hence, two local councillors each from the Kuala Lumpur City Hall and the Petaling Jaya Municipal Council, two Members of the Parliament for the area, four developers and four representatives from the Bukit Gasing Joint Action Community (NGO actors) were recruited, thereby resulting to a total of 20 interviewees. In addition, no significant differences were observed between participants’ gender and ethnic composition, which were representative of the area’s population.

All participants were carefully recruited based on their roles and involvement in the case study selected. The planners selected had been qualified planning officers in local authorities with at least five years of planning experience. The consent forms were signed by all the participants. The participants’ names were not directly referred to in this study in order “to secure the privacy of all involved” (Van Assche *et al.*, 2011, p. 4). The participants were divided into five groups based on their roles; planners, members of the public (NGO actors), Members of Parliament, local councillors and developers. The participants included are as follows;

**Table 1:** Background of respondents

<b>Planners</b>	<b>Number of Participants</b>	<b>Group Name</b>
	8	Kuala Lumpur City Hall: Planner 1 = PKL1 Planner 2 = PKL2 Planner 3=PKL3 Planner 4=PKL4  Petaling Jaya Municipal Council: Planner 1=PPJ1 Planner 2=PPJ2 Planner 3=PPJ3 Planner 4=PPJ4



<b>NGO actors</b>	4	NGO actor 1=NGO1 NGO actor 2=NGO2 NGO actor 3=NGO3 NGO actor 4=NGO4
<b>Members of Parliament</b>	2	Members of Parliament 1=MoP1 Members of Parliament 2= MoP2
<b>Local Councillors</b>	2	Local Councillor 1=LC1 Local Councillor 2=LC2
<b>Developers</b>	4	Developer 1=D1 Developer 2=D2 Developer 3=D3 Developer 4=D4
<b>Total</b>	<b>20</b>	

### Method of Analysis

The analysis focused on a constant comparison of data, codes and theoretical categories from interviews and planning documents (Bryant & Charmaz, 2007). To illustrate the data analysis, the process started with line-by-line coding from the text of the transcribed research interviews to form descriptive categories. These categories were defined using Nvivo10 to assist in managing and synthesising the ideas gleaned from the interview sessions.

## RESULTS AND FINDINGS

### Roles in the consultative process

All participants were asked to provide information on their professional practices, particularly on their roles and responsibilities in relation to planning. Most of the planners answered very briefly and were reluctant to explain their roles in detail. Planner (PPJ1) stated: “my responsibilities include processing development plans, making recommendations on any plans submitted within my authority and also dealing with the public”. “I am charged with Local Agenda 21, most of the time my jobs relate with public consultation” (PKL3). “My role often assisted the public in planning submissions, I gave advice and ensured the plans submitted followed the guidelines” (PPJ3). Planner (PKL3) provided an overview of her everyday practice:

*I enjoy being a planner because planning is very dynamic and I can make sure what planning can be implemented. I deal with the public every day. I’m charged with Local Agenda 21, which focuses on the bottom-up planning process. The planning process is important because of the numerous developments, which encourage the public to appreciate and make complaints when necessary.*

The answers demonstrated that many planners believed that their role basically involved dealing with the public in their everyday tasks. It appears that planners in Malaysia are concerned with ensuring economic, social and environmental stability via a consultative process. As observed by a participant (PKL1), the planner's role is "to ensure [the] sustainable development occurs in the local authority". In addition, the views of other actors also demonstrated a strong recognition of the planners' role. Accordingly, the NGO actor (NGO1) noted that "I am a lawyer by profession, so I know the rights of the public in my area. That is why I always deal with planners to know what is happening around my area". A local councillor (LC2) observed that:

*I am familiar with the Malaysian planning system because I used to sit on the Sustainable Planning Committee, and am currently on the One Stop Centre Committee that approves development projects and development orders. As a local councillor, I also deal with the public.*

This appears to reflect the fact that all the participants interviewed played significant roles and were committed to be involved in the consultative process. Indeed, one of the planners felt that other actors who enter governance also play a role in the process and stated:

*I think, besides us, politicians play an important role as planning is also a political will. Frankly speaking, planners always follow the guidelines and policies, but when the decision is being made, the top-level management can change our proposal/recommendation (PKL2).*

### **Modes of governance in the decision-making process**

It was widely accepted that public participation is an essential element of coordinated decision-making in Malaysia. Indeed, when asked: "Do the public give any impact and contribution to the decision-making process?", all the participants indicated that the consultative process was a significant element of democratic governance. Planner (PKL4) believes that participation is vital, stating: "we know the importance of public participation in planning, so we tried to institute that in the consultation process". "We admit that local knowledge from local people influences the development" (PPJ1). These views were supported by a Member of Parliament (MoNGO1) who stated, "of course, the public did give impact and contribute in the planning system ... this also leads to sustainable development and democracy in Malaysia". Developers and members of the public also held similar views. Thus, it could be claimed that, in the

Malaysian planning system, members of the public have the right to participate in the planning of their local areas. This also demonstrates that public participation is not a new process in Malaysia, as the public is engaged in the organised consultative sphere.

There is a form of public participation in the Malaysian planning system; however, the notion of democracy in the process is questionable. A local councillor (LC2) declared that:

*The local authority always conducts hearings and objections for all the public to attend despite the Act only allows for people within a 20-meter radius of the project. We open it to everybody, but there is no guarantee their voice is going to be heard.*

Empirically speaking, the various NGO actors felt that planners tend to lead decision-making that favours economic development. An NGO actor (NGO4) noted that “the opportunity for us to be involved in the decision-making only ends up with the new development taking place”. Another NGO actor (NGO2) commented, “so far, what I can see is that so much development is going-on despite the environmental issues experienced”. Thus, the interview data provided some insight into the challenges of the Malaysian planning system.

When the following question was raised: “*Can you identify any threats that significantly constitute impediments to public participation in the Malaysian planning process?*”, NGO actor (NGO2) responded: “there are so many problems with the current practice of public participation process”. The NGO actor also provided the example of the preparation of development plans and continued:

*...the duration of notice given on the amendment of the local plan is not enough with the difficulty to get sufficient details, the council would, until the very last minute, want to get the hearing over and executed although the time and information are inadequate. Moreover, the development will take place in the end.*

Linked to the aforementioned issue, an NGO actor (NGO3) asked: “How do I give input objectively and reasonably?” What emerged was a description of a situation in which the public participant felt that the consultative process only accommodated economic development, as the public’s views were being ignored. Additionally, the exercise of the consultative process in the Malaysian planning system also provides a form of legitimacy and transparency. Nevertheless, as one participant stated, “one of the biggest challenges we face in

Malaysia is the lack of transparency and accessibility of information to the public, which is very difficult” (NGO3). In this sense, the NGO actor (NGO1) simply stated:

*The issues are integrity issues. Integrity is the heart of the problem. I define it as doing the right thing when nobody is looking. We have an integrity problem in the decision-making in the country.*

Given these impediments to the consultative process, participants were asked about what form of practice they expected from planners. Most of the participants believed that the authority should comply “with rules that were established by lawmakers, comply with regulations, process, procedures established by the principle of good governance, and the transparency aspects” (MoNGO1). A local councillor (LC2) concluded that:

*I think many initiatives are not entrenched in law, but it is up to the goodwill of the people who sit in governance. It depends on the different sets of people who sit in governance since there is no standard mechanism on how the local council should engage in public participation. Therefore, to combat corruption and cronyism, we have a project on local government integrity. It is very important to actively involve the public to reduce manipulation and potential cheating that may occur. An open system and transparency in governance should be encouraged. Otherwise, there is no way for the public to provide views. From the governance side, we need to be more proactive to open up the space.*

Thus, perhaps, the forms of governance in Malaysia reflected the dynamics of power relations in the consultative process and provide insights into the Malaysian planning system. Indeed, the literature indicated that planners always deal with decision-making and aspects of communicating and consulting (Clifford & Tewdwr-Jones, 2013; Healey, 2006).

### **Form of transparency in the planning process**

Within the context of the consultative process, a developer (D3) who deals directly with the planning process through the submission of planning permissions to the planning department claimed that the “developer needs to plan the best way for development by having a dialogue with the authority before the actual submission starts. So we can get input from government and the process

will be smoother”. Planner (PPJ2) emphasised, “communication between us and the public is important to encourage people to participate”. Thus, the interviews revealed that planners disseminated information to the public about the general planning process. Planners communicate with the public and developers to ensure that they understand the importance of planning guidelines, policies and legislation. As a planner (PKL5) noted, “we should view complaints from the public as a compliment and try to address any issues positively to improve our everyday practice”.

Conversely, most participants displayed frustration with the current situation, noting that “sometimes the authority is reluctant to provide input, particularly at the earlier stage of the planning process” (D4). Another developer (D1) echoed this view, stating:

*I think frontline people that deal with the public sometimes are not well trained and do not have enough knowledge of the planning process. There is even reluctance to provide detailed information.*

Another developer (D3) supported this view, stating:

*There is a lack of two-way communication between planners and developers. Most of the time planners are so busy with meetings and other tasks. The practice of government also is not systemised because not all departments that were in charge of the planning process were committed to or agreed with the decisions.*

All the participants agreed that they need ‘space’ to communicate and debate planning issues. The interviewees suggested that the creation of the consultative arena in Malaysian planning practices has been used to provide rationality that reflects the public’s rights and planning accountability to the public. Hence, planners provide expert evidence and assist the public in planning matters via the appearance of consultation. The situation encourages the public, NGOs and developers to participate in a planning process that reflects the direction of participation as a key attribute of democracy in Malaysia.

Planner (PPJ2) explicitly stated:

*We need to create an understanding among the planners and other key players in the local authority because we do not just follow orders from the top management. That is why we sit*

*together with the public. This can help us to understand better what the public need in planning, not just based on the Act and guidelines.*

NGO actor (NGO3) stated: “I think if the local authority can inform the public more about their statutory rights it will be great because I am also unaware of my rights. I strongly support public engagement in the planning process”. Similarly, developer (D3) commented, “I think everybody needs to work together to ensure the public interest is protected, and our profit is not compromised”. While planner (PKL4) noted, “public participation process in Malaysia still needs improvement. I would suggest more programmes need to be conducted to inform the public about their rights”.

Participation in Malaysia depicts some clear patterns that certainly appeared to convince the public that they were being noticed and heard. This was also reflected as a form of transparency in the planning process. Accordingly, under the current planning system, the public is allowed to give suggestions. For example, during the hearing process for the Kuala Lumpur Structure Plan 2020, a planner (PKL1) noted that: “there were many objections during the preparation of Draft Kuala Lumpur Structure Plan 2020, and their concerns were our priority”. Further, another planner (PKL3) claimed that: “we always organise a forum in which all the stakeholders are involved in the discussion. For example, the Local Agenda 21 programmes and other meetings with the public and developers”. Another planner (PPJ4) also highlighted that the government had already considered the public’s views when informing them regarding the preparation of development plans. Such impulses may refer to a situation in which political possibilities seem to legitimise the public’s voice being heard and assert a critical opposition to both governance and ‘Doxa’ (common sense of the day).

## **SUMMARY AND CONCLUDING REMARKS**

Malaysia’s system of government follows the British Westminster model that supports three key branches of government: the legislature, the executive and the judiciary. This system operates at the federal, state and local levels. Malaysia has adopted a hierarchical planning system, whereby the federal government formulates policies, but planning and implementation responsibilities rest with the state and local governments. Local governments must refer to development plans and consider the public’s rights in their decision-making processes, including whether to approve or disapprove land development activities.

Accordingly, the rationale for making decisions is based on planning policies, guidelines and other technical requirements. The narrative depicts how planners deal with the public concerning the formation of the Gasing Hill case.

In many respects, the findings revealed that planning practices require reforms to face the challenges of the 21<sup>st</sup> century. This research advocated the need for more specific rigorous thinking to address questions of governance practices and public participation in planning frameworks. Notably, this dynamic mode of planning must be continuously assessed to deliberate on Malaysia's future planning direction. The findings indicate that planners have had the privilege of directing decisions in governing the consultative process; however, it also appears that they have always faced a dilemma (i.e., to choose between economic competitiveness and the public's needs). Such concerns with the nature of decision-makers in the consultative process create further challenges for future planning.

Planners fulfil the interests of the public via a consultative process. This approach produces results that ought to be avoided. Thus, the research showed that understanding the roles and responsibilities of planners is necessary if the practices that epitomise the ethos of participatory democracy in Malaysia are to be changed. Planners should readjust their functions and actions to suit contemporary planning by balancing economic, social and environmental wellbeing. In this spirit, the notion of this research was not just concerned with democracy, but also with future actions structured by the present.

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## **IMPACTS OF INTEGRATED RURAL DEVELOPMENT (IRD) TOWARDS TRADITIONAL VILLAGE ECONOMY IN KETENGAH, TERENGGANU, MALAYSIA**

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### **Abstract**

This study investigates the anticipated impacts of an integrated economy on six (6) traditional villages in the District of Dungun, Terengganu, Malaysia, which villages have undergone “Integrated Rural Development” (IRD). The IRD has promoted a continual intervention and collaboration process that involved external parties, including government agencies, to improve the rural local economy and the villagers’ quality of life. The villagers’ aspiration to improve their economic wealth was blended carefully with the preservation of local values through local distribution, thus reducing rural-urban incongruity. Alternatives were also sought to strengthen and use natural resources. The integrated economic sectors assessed in these villages were agriculture, livestock, aquaculture, small-and-medium entrepreneurs (SME) industries, and rural tourism. This paper seeks to evaluate the impacts of these economies on the concept of IRD by using Creative Index Analysis (C.I) in determining the best practice framework. By emphasising the principle of “best value for money”, CI was used to measure the value of anticipated impact, particularly the benefits that will be received by the people against the cost of development and operation for a period of its lifespan. A 1.0 creative index value refer to a rural area that has an economic integration potential and disparities that were overcome by the analysis. Most importantly, more than 78% of the 114 respondents from this area agreed with the project implementation. To ensure the impacts of the IRD project, the development framework proposes the consideration of at least three potential aspects within five years of implementation: training, new and existing development, and assistance in product marketing

**Keywords:** Rural, Integrated Rural Development, Feasibility, Creative Index Analysis

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## INTRODUCTION

The Malaysian Rural Development Policy indicates that the main vision of rural area developments is toward a “*prosperous, inclusive and holistic rural area.*” Rural settlements in Malaysia can be defined as settlements that have a total population of fewer than 10,000 people and those whose majority of the population is involved in agricultural sectors as their main economic activity. Traditional villages that comprise fishing villages are those located along the coast, while agricultural-based villages are those whose most villagers are involved in agriculture and other economic activities related to agriculture. These villages have long existed through natural growth, and many are scattered in nature without definite boundaries. These villages are distributed along the main transportation networks and rivers.

This paper examines the anticipated impacts of the Integrated Rural Development (IRD) implementation on the rural economy of traditional villages in the District of Dungun, Terengganu, Malaysia, which is a pilot project initiated by the Ministry of Rural Development. The projects in this area are in line with the national policy as their visions are to improve the rural economy.

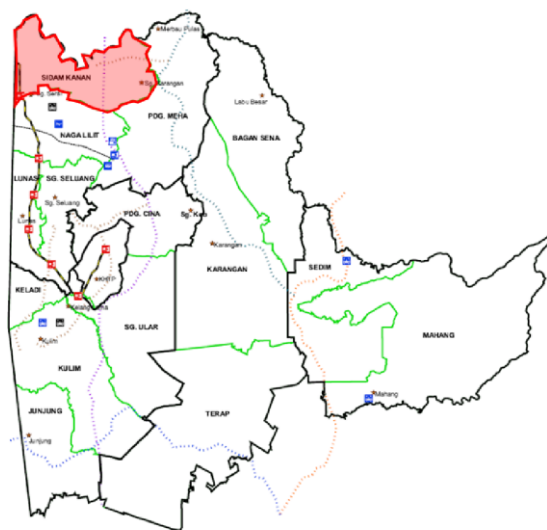
An integrated rural development can be defined as a series of mutually supporting (inter-related), agricultural and non-agricultural activities oriented towards a stated objective that involves improvements in the rural system as a whole. The IRD seeks to improve productivity, incomes, infrastructure, and social development within a rural area. The development is based on the principle of indigenous development and growth, community involvement, and decentralised government (Tony Gore, 2006).

Another key element of IRD is striking a balance between economic, social, and environmental objectives. This orientation emerges from the definition of integrated rural development projects by the World Bank: “Rural development programs or projects are intended to provide a sustained increase in the output and the level of living of a significant proportion of the rural poor in a given area” (Baltimore, 1975).

The IRD concept used in this study refers to the continual process that involves the interference of external parties and is based on the aspiration of the local population, which aims to improve the quality of life of the target group and preserve local values through local distribution and redistribution. At least 5 (five) components of economic activities are involved in this study, namely (1) agriculture, (2) livestock, (3) aquaculture, (4) small-and-medium industries, and (5) tourism.

Six villages were selected within the district of Dungun, Terengganu, Malaysia (Figure 1). The study area covers Kampung Talong, Kampung Kuala Jengai, Kampung Pasir Raja, Kampung Syukur, Kampung Jongok Batu and Kampung Minda. The locations of these traditional villages have been chosen by

KETENGAH for the IRD pilot projects. The villages selected were in remote areas, hence the constraints of accessibility. However, the richness of the villages' natural resources and existing economic activities provide opportunities for the expansion of economic activities in the study area. In terms of land use, many of the areas are not developed, thus providing the best opportunities for IRD implementations.



**Figure 1:** Location of Study Area

To investigate the impacts of the IRD in these villages, the following techniques of analysis were used: (1) SWOT analysis to identify Strengths, Weakness, Opportunities and Threats, (2) gap analysis to determine the current achievement and existing economy activities with the proposed project, and (3) Creativity Index (C.I) analysis to determine the implementation of the new project that has been structured in accordance to the principle of best value for money.

Approximately 80% of the land in the study area is undeveloped and therefore was considered by the ministry for IRD implementation. Appropriate measures and incentives must be chosen in light of district particularities. The integrated operation moreover requires effective horizontal coordination at a regional level (Lembaga Kemajuan Terengganu Tengah, KETENGAH) and for this multisectoral-oriented planning, control, and administration units with far-reaching competencies in the region concerned must be set up first.

## METHODOLOGY

Creativity Index and Return on Investment analysis were devised to evaluate the proposed projects in the villagers. These analyses were preceded by interviews with the entrepreneurs and villagers on the sites, subject to the projects they were taking part.

The data obtained from the site visit interviews were codified in a SWOT matrix. A SWOT analysis is considered the most accepted tool in strategic planning for its simplicity and practicality (Pickton & Wright, 1998). The analysis assesses four elements, namely “strengths”, “weaknesses”, “opportunities”, and “threats” (Gurel & Tat, 2017). Aside from its primary purpose for constructing the development plan, the SWOT analysis was also used inductively in the reasoning components of the development plan.

Another tool used to provide a descriptive context for the development plan was a gap analysis. A gap analysis conceptually compares current practices against respective benchmarks (Balm, 1996). In this study, the gap analysis was devised to address the “gap” or weakness of the existing practices and propose possible solutions for the targeted projects, the purpose being to empower the development plan.

A CI analysis provided a numerical evaluation for this study. The analysis was used to assess the targeted projects of the development plan. CI was introduced in the Eleventh Malaysia Plan by the Economic Plan Unit of the Prime Minister’s Department of Malaysia as a project selection tool. In this analysis, the impact of the proposed project within a set period was estimated in proportion to the cost of development and operation of the proposed projects. A high CI value indicates a high impact on monetary value compared to the budget. In this study, the targeted projects were evaluated in terms of the best value for money, which lead to the projects being prioritised (Figure 2).

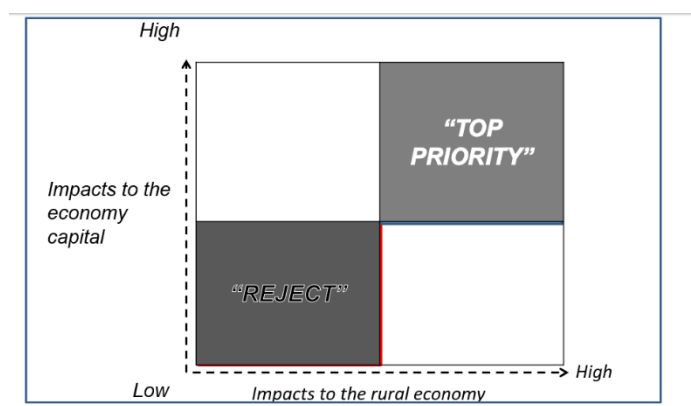


Figure 2: Creative Index (C.I) Measurement

A quality project will produce a high impact on the people at a low cost to the government. In this study, C.I was used as a tool to measure the ability of projects to provide high-impact value to the people at a low cost to the government. Projects that resulted in higher foreseeable impact were considered feasible.

## SWOT ANALYSIS

The six villages involved in this study can be characterised as remote rural areas with natural rainforests in their surrounding. The villagers thrive on traditional agriculture activities such as raising swamp buffalos and freshwater fish farming in ponds, while also serving the growing interest in their ecotourism attractions. As noted by Arshad and Shamsudin (1997), the local economy is low in productivity, basic infrastructure, and market imperfections, mostly due to a lack of accessibility and sustaining frequent flooding (Table 1). KETENGAH's commitment to implementing the IRD was to exploit the quality and prospects of the villages while tackling the difficulties. Correspondingly, the villagers shall bank upon the benefits brought by the development plan.

**Table 1:** SWOT Analysis Findings

SWOT	Findings
Strength	<ul style="list-style-type: none"> <li>● Availability and undeveloped lands</li> <li>● Attractive natural resources</li> <li>● Existing buffalo farms</li> <li>● Integrated aquaculture projects</li> <li>● Strong networking between local leadership and villagers</li> <li>● Effective promotion</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>● Conventional use of equipment</li> <li>● Lack of skilled manpower</li> <li>● Poor marketing system</li> <li>● Poor networking between villagers and agencies</li> </ul>
Opportunities	<ul style="list-style-type: none"> <li>● High supply and demand</li> <li>● Tourism attraction</li> <li>● Create job opportunities</li> <li>● Active local participation</li> </ul>
Threat	<ul style="list-style-type: none"> <li>● Expensive raw materials</li> <li>● Natural Disaster</li> <li>● Limited marketing due to the low accessibility</li> <li>● Financial aids</li> </ul>

## **GAP ANALYSIS**

The immediate discussion on gap analysis for this study is divided into five sectors. For agriculture, the gap identified is the lack of machinery, and irrigation, as well as low yields due to inefficient management knowledge. This can be solved by purchasing machinery to achieve yields twice a year. Fertilizer subsidising and pruning courses may also help in alleviating the issues.

The targeted project for small and medium industries focused on the enhancement of skills and knowledge among the participants and funds for the Village Entrepreneur Carnival. A gap was identified in terms of a lack of knowledge in financial management and an insufficient marketing system. Providing courses and training to entrepreneurs while monitoring their business growth will facilitate expanding their marketing prospects.

The livestock and aquaculture project targeted cattle and buffalo farming and an enhancement of the infrastructure of the integrated fishing system. The latter was to be achieved by supplying the activity with the high demand from the market, besides having the existing 32 ponds as a potential for freshwater fish rearing. With regard to its potential, the availability of highly interested youth villagers may become one of the factors in achieving the targeted project. The gap identified includes a lack of knowledge and an incomplete ecosystem of production in livestock management. These shortcomings require high capital investment. Programmes such as mentor-mentee and the diversification of activities may help reduce the gap.

The developments of tourism at Kampung Shukor and Kampung Pasir Raja have been identified as among the projects that can give high impacts on the community because of an existing waterfall and homestay. However, a lack of activities and facilities are among the gaps identified in developing this sector. Hence, the provision of more water activities and a campsite equipped with facilities may attract more tourists to the area.

## **CREATIVITY INDEX (CI) ANALYSIS**

Creativity Index analysis is an instrument used by the government to determine the implementation of a planned project. By emphasising the principle of “best value for money”, CI measures the value of impact whose benefits will be received by people compared to the cost of the development and operation of a project for a period of time. The costs calculated in the CI for this study included development costs and operating costs. The impact was measured according to several impact parameters namely income, cost of living, convenience, and comfort, health, peace and safety, harmony, recreation, and a sustainable environment. At the time of writing this report, the measured impact is the main impact that has a direct impact on villagers; it has been summarised as an increase in the value of sales revenue, cost reduction and savings, and an increase and

revenue generation. The process of calculating the CI for a project is the total impact divided by the total cost. The CI value also means the ringgit value of the impact return for each ringgit spent on one project.

For agriculture, more *Citrus reticulata* can be produced with the number of yields that can achieve RM250,000 when sending the participants to the pruning and tree care course with the CI value of 18.15. If the fertiliser of these crops were subsidised to 50% and providing the pesticides with the systematic planting technique, the yield may increase up to RM600,000 with a CI value of 34.28 by the fifth year of implementation.

With an RM42,000 cost to send participants on the livestock courses in the first year, the sales market may reach RM172,500 with a CI value of 17.25, and this amount will be sustained until the fifth year of implementation. An aquaculture CI value may reach 12.46 with the implementation of a five-year project of freshwater fish rearing by upgrading the existing area with infrastructure, including a drainage system, a pump water house, and a pool structure. The total cost for the project proposed is RM160,000, but the impact in terms of income may reach RM480,000.

The CI analysis for small and medium industries shows that the development skills programme in the first year may reach the value of 2.66 with the involvement of Local Action Groups (LAG) from TEKUN Nasional, People's Trust Council (MARA), Malaysia Entrepreneur Development Center (MEDEC) and Small Medium Industry Development Center (SMIDEC). In the fifth year, with an average sale of RM17,000, the CI value may reach 3.75. While for tourism, the CI value in the fifth year of implementation for the proposed chalet development and upgrading of the infrastructure and facilities in Kampung Pasir Raja and Kampung Shukor may reach 5.75 with a total cost of RM 240,000 and income of RM 2,172,000.

## **IRD IMPLEMENTATION GUIDELINES FOR KETENGAH**

Any kind of development proposed for agriculture must obtain land approval from the local authority. Important aspects that need to be considered are as follows: (1) a 3-metre buffer zone needs to be provided from the proposed project area; (2) permanent farming is not allowed due to the temporary land status; (3) the approval needs to be renewed. The provision of machinery for the crops was suggested to be monitored by KETENGAH annually. In agriculture, pesticides are used to kill pests and insects that attack crops and harm them. While pesticides benefit crops, they also impose a serious negative impact on the environment (Mahmood et al., 2016).

In terms of sustainability, farmers are highly recommended to use organic pesticides and fertilisers to reduce the environmental effect on the land area. The application and maintenance of heavy machinery to improve agriculture

need to be recorded properly to avoid damage. The machinery must be used only by licensed skilled workers.

The livestock sector proposed courses that need to be attended by the villagers, and the participants selected must meet specific criteria because of the high cost of each course. The participants must meet the requirements of age, be local people, be financially stable to sustain the livestock project and be qualified for the micro-loan provided by *Tabung Ekonomi Belia Skim Belia Tani*.

The panel selected must be among qualified officers with a minimum of 30 years in livestock and be monitored by *Jabatan Perkhidmatan Veterinar (JPV)*. The participants' details must be recorded and monitored from the early stage and after the end of the course. The integrated food supply that manages livestock food, vaccine, food container, and other important needs for livestock must be centralised, and the sales revenue can be used to send more participants to the courses offered to encourage more villagers to be involved in the livestock sector.

Linkages between the food processing industry with the farmers need to be strengthened to ensure that they get the food supply from the farmers, hence providing opportunities for the farmers to expand their income. The small-scale factories need to focus on the needs of the local livestock farmers and the data management of livestock and online sales. These activities need to be controlled by skilled workers, especially youth.

It is important to track and record the integrated livestock sales to minimise loss. A Memorandum of Understanding (MOU) between ruminant breeders and the estate needs to be signed and initiated by KETENGAH so that the estate will be given incentives for tax reduction on the land used for grazing.

The aquaculture sector proposed a rearing cage for freshwater fish. The construction of the cage underneath water must not interfere with the flow of water, and the proposed area must not interfere with the boat or any water transport movement. The same applies to agricultural economic activities. Farmers need to ensure that the water is not polluted while doing this activity and as a result, 20 meters of buffer zone need to be built from the breeding area. Sewage from aquaculture activities must be treated before it flows to the river and needs to be advised by *Jabatan Alam Sekitar (JAS)* for the guidelines. All construction structures must obey the Act of *Undang-undang Kecil Bangunan Seragam 1984*.

The construction of the breeding centre needs to be equipped with important tanks for a fish breeding process, such as the main tank, generator, water pump, ventilators, and water reservoir tank. In addition, the induction of fish spawning may also help in generating more income for the aquaculture sector. Most importantly, a quality master should be selected to obtain quality seeds. The recommended age for males is 4 months with 300–600 grams while



for females is 5 months with 400–800 grams. Hormone needs to be used to stimulate the gonad and encourage the ovulation process. Hormone dosage, timing, and amount need to be considered to obtain the best result.

The small and medium industry sectors emphasised the need for the villagers to attend several courses to ensure effective production.

Financial management, accounting, and acquisition are examples of courses that the villagers can be exposed to at least once in 6 months. Another course is effective marketing strategies by monitoring the achievement in one year to ensure the business runs smoothly according to the training. Skill and development programs may help in improving small and medium industry workers' skills by providing business clinic, seminars, training, and aids.

MARA and MEDEC (*Pusat Pembangunan Usahawan Malaysia*) are agencies that can provide courses on ISO 9000 and knowledge related to business. The location of the integrated centre for village products needs to be identified, and cooperation between *Jawatankuasa Kediaman dan Keselamatan Kampung* (JKKK) may help collect the villagers' products that are currently produced scattered in the IRD-implemented villages. Appropriation funds need to be distributed fairly and equitably by KETENGAH so that a carnival can be organised for the entrepreneurs at least twice a year. This carnival may help entrepreneurs market and establish their products.

The tourism economy sector proposed in this IRD must not be against the original function of the existing river. A 15-metre buffer zone needs to be provided for recreation developments in this area. Safety features like signage and buoy need to be provided for the water recreation activities, and the boats to be used for these activities require a four-stroke engine for controllable speed and to avoid the creation of waves at the water recreation area. The structure of the boats must be collapsible and able to release water during a flood. The floating restaurant proposed needs to take into account the location and application of the jetty construction and needs to get approval from JPS to prevent erosion.

## **IMPACTS OF INTEGRATED RURAL TOURISM ON THE TRADITIONAL VILLAGE**

The impact of Integrated Rural Tourism on the Traditional Village in KETENGAH was identified from the analyses and output from the site visits for the years 2020 and 2021. For the aquaculture project, 20 units of fish nets and PH measuring tools were given to 20 participants of freshwater fishpond breeders. In addition, 110,000 fish seeds and 880 bags of fish food were given to the participants. All the outcomes initiated by KETENGAH were then measured in terms of impacts for the years 2020 and 2021. Because this project is located in Terengganu, on a bigger scale, the aquaculture economy has given impacts by providing as much as 13 tonnes of protein sources to the Terengganu state in 2020

and 11 tonnes in 2021. The reduction of sources between 2020 and 2021 was due to the Movement Control Order (MCO) following the pandemic Covid-19, which also affected the participants in the village and the aquaculture economy. However, this sector is expected to rise again in 2022. In terms of income, the aquaculture economy project has provided an average income of RM700 to RM1,500 per month.

For the ruminant poultry, 3 units of buffalo stables, 2 units of goat shelters, and 1 unit of chicken coops were targeted to give benefits to 8 villagers. The impact of this output can be seen from the provision of livestock management facilities to help develop the economic activities of the population. For the small and medium industry sector, 48 units of business tools and 16 units of shop sign boards were expected to give benefits to 16 entrepreneurs. This initiative has given impacts by increasing the villagers' income from RM60 to RM300 per day for the lowest (500% increment) and RM1,200 to RM2,000 per day for the highest (66.6% increment).

Tourism was another economic component measured to assess the impact of the IRD. For the homestay project, 20 units of homestay were restored, and this output is expected to benefit 20 participants in the village. This initiative also increased the participants' income from RM500 to RM800 per month. According to the homestay owner, tourism is one of the most badly affected sectors during the MCO because people were not allowed to cross country and the pandemic recorded no tourist arrival for almost two years. Besides helping individual homestay owners, KETENGAH also provided the following public facilities in the village tourism area: one unit of surau and one unit of a public toilet in Sungai Kelemin Kampung Minda. The provision of these public facilities has provided comfort to tourists and encouraged revisits.

Each of the villages involved in the IRD has its distinct potential in terms of original character and natural resources. Each of the potentials identified was used to upgrade the existing activity and introduce new economic activities. Village administrative institutions are one of the potentials of every village covered in this study.

The connection and cooperation between all villages may ease the IRD concept to be implemented. Additionally, the IRD could potentially expand job opportunities to all the youth and villagers. Two years into implementing the concept in the village, all the projects from all economic sectors benefited the participants. Having all the economic activities from all sectors may create job opportunities that may enhance the villagers' economy. Employment opportunities may help solve social and unemployment problems among the youth in the villages.

**Table 2: Impact of Implementation of IRD Projects**

Component	Impacts
Aquaculture livestock	<ul style="list-style-type: none"> <li>● Provide additional protein sources to the state of Terengganu as much as:                             <ul style="list-style-type: none"> <li>● 2020–13 tonnes</li> <li>● 2021–11 tonnes</li> </ul> </li> </ul>
Ruminant and Poultry	<ul style="list-style-type: none"> <li>● Provided an average income from RM700 per month to RM1500 per month</li> <li>● Provided livestock management facilities to help develop the economic activities of the population</li> </ul>
Business Premises	<ul style="list-style-type: none"> <li>● Increased the average income lowest from RM60 per day to RM300 per day (500%) and highest from RM 1200 per day to RM 2000 per day (66.6%)</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>● Increased the income for homestay operators from RM500 per month to RM800 per month</li> <li>● Provided comfort to visitors</li> </ul>

## CONCLUSION

From the analysis, the IRD project proved to have given positive impacts on the Traditional Village KETENGAH area on several factors. The SWOT analysis found that the study areas have strengths and potentials that may facilitate the success of the IRD. Whereas, the CI value for all the projects exceeded 1.0. More importantly, the GAP analysis showed that all the gaps can be addressed. IRD is a project involving the cooperation of more than one agency. Networking and relationship between agencies were found to be excellent; KETENGAH as LAG has played a crucial role in monitoring the IRD project. IRD is also a project that requires active participation from the villagers. Seventy percent of the villagers agreed that the implemented projects are many that lead to the overall success of the programme. However, all the projects must follow the guidelines proposed by the agencies in order to ensure their effectiveness.

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## **COMMUNITY PARTICIPATION IN THE URBAN PLANNING DECISION-MAKING PROCESS AMONG THE LOW-INCOME SEGMENT IN ISKANDAR MALAYSIA**

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### **Abstract**

Community participation in urban planning in Peninsular Malaysia is framed by the Town and Country Planning Act 1976. Iskandar Malaysia is facing rapid urbanisation, which sees development intensification, especially in Johor Bahru. As a result, it has inflicted challenges on local planning authorities in Iskandar Malaysia to plan and provide genuine participation to the community, especially the low-income segment. The question in this study is, "to what extent does the current participatory platform in Iskandar Malaysia offer a genuine opportunity to the low-income segment to participate in the planning and operational decision-making?". This study examines the current state of the low-income segment's participation in the development plan-making and planning permission processes. This study used document gathering and document analysis to collect and analyse the secondary data from selected local plans and planning permission applications of Johor Bahru and Kulai districts. A series of focus group discussions involving the residents' committees of the selected low-cost apartments around Johor Bahru and Kulai districts is also conducted; hence, thematically analysed to substantiate the document analysis' findings. The findings suggested limited opportunities for the low-income segment to participate in development plan-making and planning permission in Iskandar Malaysia.

**Keywords:** community participation, low-income, planning decision, operational decision, local planning authorities, Iskandar Malaysia

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## **INTRODUCTION**

Community participation provides a clear picture to decision-makers of public preferences, leading to better decisions by incorporating the community's experiential knowledge into the process (Marzukhi, 2021; Boon et al, 2020; Innes & Booher, 2004). Community participation in urban planning in Peninsular Malaysia (except Kuala Lumpur) is governed by the Town and Country Planning Act 1976 (Act 172) (TCPA 1976). Urbanisation has led to the rapid population growth and development in urban areas, including in Iskandar Malaysia (IM), leaving the local planning authorities (LPAs) with challenges in running their operations. It is understood that LPAs are struggling to govern urban development and provide effective community participation in decision-making (Ahmad et al., 2013). Low-income segment, which in this study, focuses on low-cost apartments' residents around IM, appears to lack capabilities to participate effectively in urban planning, hence exerting their interest in decision-making.

This study anticipates answering the question: "to what extent do the current participatory platforms in Iskandar Malaysia, like exhibition, offer a genuine opportunity to the community, especially the low-income segment, to participate in both the planning and operational decision-making?"

The purpose of this study is to examine the current state of the community, especially the low-income segment's participation in both the development plan-making and planning permission processes in Iskandar Malaysia. This study employed document gathering and document analysis as the methods for data collection and analysis. The data was retrieved from three Reports of Public Inquiry and Hearing Committee for respective local plans of Johor Bahru and Kulai and 12 mixed development applications shared by the LPAs in Johor Bahru and Kulai. Moreover, nine (9) focus group discussions (FGDs) involving the residents' committee of the selected low-cost apartments in Johor Bahru and Kulai districts managed to be conducted. The data are then analysed using thematic analysis to gather insight into the current state of participation in the planning process among the low-income segment, thus affirming the findings from the document analysis.

The study begins by explaining the notion of community participation in urban planning in Peninsular Malaysia based on what has been delineated in TCPA 1976. The data retrieved from the planning documents and FGDs were then analysed and triangulated. The paper concluded that the current community participation in the development plan-making and planning permission in Iskandar Malaysia has pointed to the ineffectiveness of the process, thus limiting the low-income segment's capability to participate in both the planning and operational decision-making.

## **COMMUNITY PARTICIPATION IN PLANNING AND OPERATIONAL DECISION-MAKING IN PENINSULAR MALAYSIA**

In the context of local planning authorities in Peninsular Malaysia, local communities are able to participate in both the development plan-making and planning permission processes, where both are defined as planning decision and operational decision, respectively (Faludi, 1987).

### **Community Participation in Development Plan-making**

Community participation in the development plan-making has been underlined in several sections of TCPA 1976. The primary platform for the community to participate in the process is through public publicity, which has been stated under Section 9 and Section 12A, with the former concerning the State Structure Plan (SSP) while the latter is on the Local Plan (LP).

Under Section 9, two phases of publicities are involved, namely after the assessment report is prepared and after the SSP has been drafted. During the first phase, all stakeholders, including the community, will be informed of the findings of the assessment report. Meanwhile, in the second phase, the State Planning Committee (SPC) will invite the public and publicise the drafted SSP, which comprises the proposed development's direction and strategy (Town and Country Planning Act 1976).

Likewise, the community can submit their objection or opinion on the drafted LP during the publicity program as stated under Section 12A. The public, including the community, is informed and invited through conventional methods like local newspapers, banners, and radio broadcasts.

Apart from participating during the publicity stage, the community is also eligible to participate in decision-making. It is highlighted under Section 10(3)(a) and Section 13, where the former is related to the objection made during the publicity of the drafted SSP, while the latter is during the drafted LP. Both sections have indicated that the objectors can justify their concerns in front of the Public Inquiry and Hearing Committee.

A Public Inquiry and Hearing Committee has been established under Section 14(1). The committee's function is to conduct an inquiry and hearing session following the publicity programs of both SSP and LP. Nonetheless, according to Section 15(1), in considering each objection, the SPC must ensure that it is relevant and conforming to the development strategy at the national and state levels (Town and Country Planning Act 1976).

### **Community Participation in Planning Permission**

In addition to development plan-making, communities are eligible to participate in the planning permission, which is the operational dimension of a decision made

by the LPA. According to Section 21(6), in the absence of a local plan, the LPA must inform the adjacent landowner regarding an application for planning approval. Following the notification by the LPA, the adjacent landowner has the right to make an objection pertaining to the application. The applicant and objector are invited to justify their stand in a hearing session (Town and Country Planning Act 1976). In other words, this opportunity is only accessible to the community when the LP is not available. Notwithstanding, the majority of LPA today have their LP (PLANMalaysia, 2018).

In relation to the incorporation of community interest in the operational decision, Section 22 and subsection 22(2A) have comprehended that in making a decision - granting planning permission, the LPA will consider any objection that is received by the adjacent landowner (Town and Country Planning Act 1976). However, with the availability of LP, it is ambiguous whether there is still an available platform for the community to participate in the planning permission process. After a decision is made, the community is entitled to appeal against the permission granted through the appeal board, as underlined in Section 23(1). However, only objectors, as stated in Section 21(6), have access to this avenue (Town and Country Planning Act 1976).

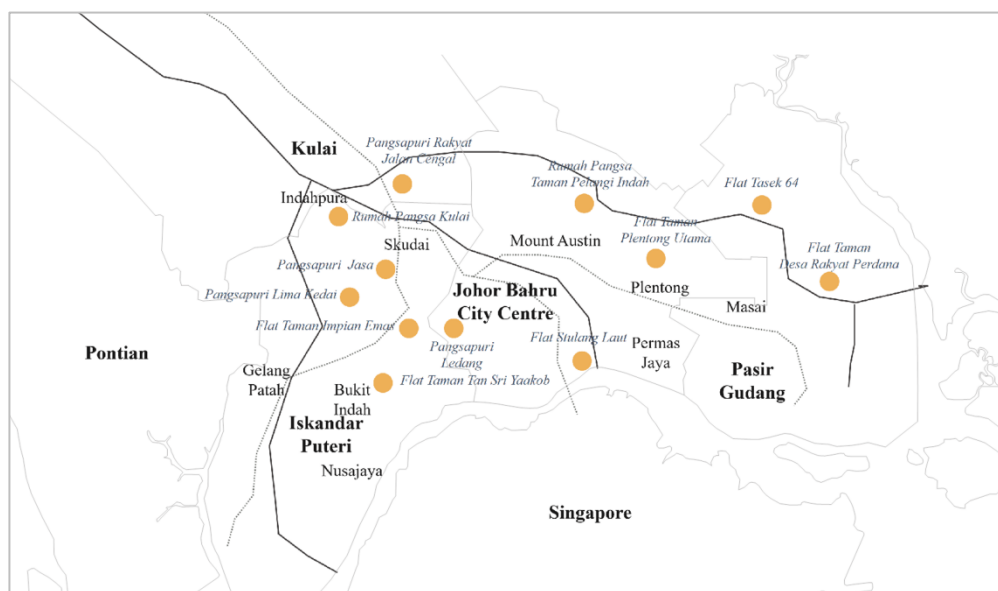
## **ISKANDAR MALAYSIA**

Iskandar Malaysia (IM) is one of the development corridors that has been established as the catalyst for future economic development in the country. IM was established in correspondence to the need for a focused and developmental approach to the economic and spatial development in South Johor based on its strategic location neighbouring Singapore (Razak *et al.*, 2016; Rizzo & Glasson, 2012).

IM comprises the entire districts of Johor Bahru and Kulai and a small portion of Pontian. In this study, only Johor Bahru and Kulai districts and their respective LPAs are focused on, as both districts cover a large portion of the metropolitan region. Besides, the urbanisation rate is higher in both districts compared to Pontian.

Meanwhile, residents' committees of nine (9) low-cost apartments around IM are purposely invited as participants for FGDs. The selection of these committees is based on several criteria - the category and location of apartments which are clustered by LPAs in Johor Bahru and Kulai, and registered as Management Committee (MC) or Joint-Management Board (JMB) (**Figure 1**). The low-cost apartments involved in the FGDs are Flat Taman Desa Rakyat Perdana, Flat Taman Plentong Utama, Rumah Pangsa Kulai, Pangsapuri Taman Impian Emas, Flat Tasek 64, Pangsapuri Ledang, Flat Stulang Laut, Pangsapuri Taman Pelangi Indah, and Pangsapuri Rakyat Jalan Cengal.





**Figure 1:** Selected Low-cost Apartments Around Johor Bahru and Kulai

## RESEARCH APPROACH

In this study, three LPs, namely the LP Johor Bahru 2020, LP Johor Bahru 2020 (Alteration) and LP Johor Bahru and Kulai 2025, covering the districts of Johor Bahru and Kulai were selected. The justification behind the selection of all three LPs is based on the fact that these plans are prepared in parallel to the timeline of Iskandar Malaysia, as this metropolitan region was established in 2006. The content of individual reports for the Public Inquiry and Hearing Committee is analysed to explicate the scope of community participation in making the selected LPs.

Meanwhile, the scope of community participation in planning permission in Iskandar Malaysia is examined by analysing the content of the mixed-development application. Applications for planning permission were granted from all four LPAs in Johor Bahru and Kulai based on the criteria listed, which include that the application must be a mixed development application; it involves the interest of the community, and it must be dated within 2008-2018. A total of 12 mixed development applications are willingly shared by the local public planners.

The justification for selecting the mixed development applications is based on the current trend of urban planning in IM. Mixed development is popular among private developers as it is considered high value and is often located in a limited urban land area. The analysis mainly focuses on incorporating the low-

income segment's interest in operational decision-making, including providing affordable and low-cost housing and commercial units.

In this research, document analysis was employed to review and evaluate the state of the low-income segment's participation in the gazetted LPs of Johor Bahru and Kulai and the approved planning permission. It is based on the reports of the Public Inquiry and Hearing Committee and the mixed development applications.

To gain further understanding of the low-income segment's participation in the planning process in IM, a series of FGDs were held where residents' committees of selected low-cost apartments around IM participated. The purpose of FGDs is to gain further understanding of the low-income segment's participation in the planning process in IM by thematically analysing the primary data. A total of 67 participants were recorded in the nine FGDs, with an average of seven participants in each FGD (**Table 1**).

**Table 1:** Profile of Participants of Focus Group Discussion

<b>Profile of Participant of Focus Group Discussion (PA)</b>		
<b>Position</b>	<i>N</i>	<b>%</b>
Chairman	9	13.4
Secretary	9	13.4
Committee's Member	49	40.2
<b>Reside</b>	<i>N</i>	<b>%</b>
More than 20 years	20	29.8
10 to 20 years	41	61.1
Less than 10 years	6	9.1
<b>Profession</b>	<i>N</i>	<b>%</b>
Public Sector	3	4.5
Private Sector	47	70.1
Retiree/ Not Working	17	25.4
<b>Attend Publicity Program</b>	<i>N</i>	<b>%</b>
Has Attended	24	36.0
Never Attend	43	64.0

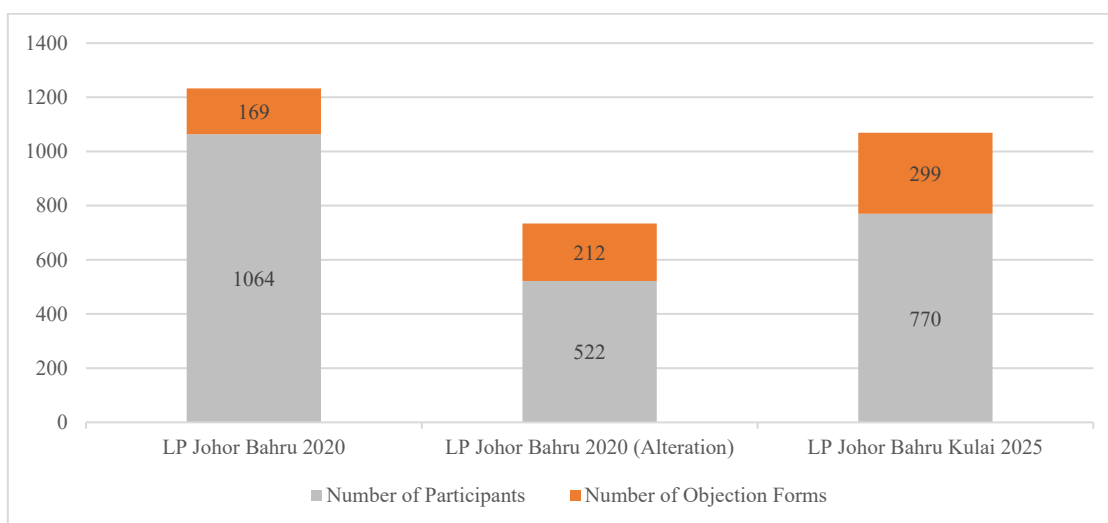
*Source: Zanudin (2020)*

## RESULTS AND FINDINGS

### Scope of Community Participation in Local Plan of Johor Bahru and Kulai

Following the analysis of three Reports of Public Inquiry and Hearing Committee for respective LPs of Johor Bahru and Kulai, the LP Johor Bahru 2020 (Alteration) recorded the lowest number of participants compared to the LP Johor

Bahru 2020 and LP Johor Bahru and Kulai 2025 (**Figure 2**). LPAs in both districts depend on newspapers and banners as the method of communication during the LP Johor Bahru 2020 (Alteration). However, other methods such as official website and notices to community leaders were utilised during the LP Johor Bahru and Kulai 2025 to ensure that more communities had access to the information (**Table 2**).



**Figure 2:** Number of Participants and Objection Forms Received  
 Source: Zanudin (2020)

The number of participants is also influenced by the method of engagement used by the LPAs. Exhibitions held at the authorities building appear to have failed to attract larger participants than exhibitions in public areas such as in shopping malls. The high turnout in LP Johor Bahru 2020 and LP Johor Bahru and Kulai 2025 was potentially contributed by the numerous and close-to-community participatory platforms offered (**Table 2**). Participatory platforms closer to the low-income household like those held in Kampung Pok, Skudai, and Rumah Pangsa Cendana help the LPAs gain their opinion, hence improving their knowledge and awareness. These methods will subsequently promote inclusive participation (Bryson *et al.*, 2012; Michels & De Graaf, 2010; Mustapha *et al.*, 2013; Zanudin *et al.*, 2019).

**Table 2: Method of Communication and Engagement**

	<b>LP Johor Bahru 2020</b>	<b>LP Johor Bahru 2020 (Alteration)</b>	<b>LP Johor Bahru Kulai 2025</b>
Method of Communication	(a.) National Newspaper (b.) Banner (c.) Radio Station	(a.) National Newspaper (b.) Banner	(a.) National Newspaper (b.) Banner (c.) Official Website (d.) Invitation to community leader
Method of Engagement	<b>Exhibition</b> (a.) Danga Bay (b.) JPBD Johor building (c.) LPAs' building <b>Briefing</b> (a.) Minister (b.) State government (c.) Political party (UMNO)	<b>Exhibition</b> (a.) Hotel Puteri Pacific (b.) JPBD Johor building (c.) LPAs' building	<b>Exhibition</b> (a.) Persada International Convention Centre (b.) JPBD Johor building (c.) LPAs' building (d.) Sutera Mall (e.) Faculty of Built Environment, UTM (f.) Rumah Pangsa Cendana (g.) Hutan Bandar Putri Kulai (h.) Bus Terminal Gelang Patah <b>Townhall</b> (a.) Jotic Auditorium (b.) Skudai community <b>Discussion</b> (a.) Skudai community (b.) Kampung Pok community <b>Walkabout</b> (a.) Taman Rinting

*Source: Zanudin (2020)*

The gap in the participation between the low-income segment and other urban stakeholders was large with the number of objections among business operators, private developers, and property agencies being the highest in all three LPs (average of 43.3% of total objectors). It was followed by the high and middle-income households as the second-highest objectors in the LPs (average 40% of total objectors) (**Table 3**). The involvement of low-income households in the LPs was still low compared to other community segments.

**Table 3: Profile of Objectors**

<b>LP Johor Bahru 2020</b>		<b>LP Johor Bahru 2020 (Alteration)</b>		<b>LP Johor Bahru Kulai 2025</b>	
Profile of Objector	Number	Profile of Objector	Number	Profile of Objector	Number

Community (T20/M40)	52	Community (T20/M40)	79	Community (T20/M40)	78
Community (B40)	5	Community (B40)	1	Community (B40)	15
Business Operator	55	Business Operator	81	Business Operator	91
Developer/Property Agency		Developer/Property Agency			
Private consultant	1	Private consultant	11	Private consultant	17
Political party	5	Political party	0	Political party	1
Civil society	7	Civil society	1	Civil society	11
Academician	3	Academician	2	Academician	3
<b>Total</b>	<b>128</b>	<b>Total</b>	<b>175</b>	<b>Total</b>	<b>216</b>

Source: Zanudin (2020)

Substantially, the participants in the eight FGDs believed the LPA did not provide sufficient access to the residents to participate in the planning process. No planning programs were ever held near the low-cost apartments [FGD1; FGD2; FGD3; FGD4; FGD6; FGD7; FGD8; FGD9]. The LPAs instead invited the residents' committees to attend the publicity program, which was often held at the council's building [FGD1; FGD2]. Participants in FGD5, meanwhile, agreed that there was a publicity program organised by the LPA at their place.

*“There is a publicity program for the LP organised here. The previous Chief Minister of Johor also attended the program.”*

Participant No.38, FGD5

Furthermore, they believed the local authority is selective in communicating with the community, especially the low-income segment [FGD1; FGD2; FGD3; FGD4; FGD5; FGD7; FGD8; FGD9].

*“I do believe that the government or local authority feels that it is unnecessary to gather the opinion of common people like us. They only need to discuss the matter between them. They did not even involve the residents’ committee.”*

Participant No.51, FGD7

Following the FGDs, it appears that most of the low-income segments are technically inept regarding the planning procedure, thus marginalising them

from participating in the planning process [FGD1; FGD2; FGD3; FGD4; FGD7; FGD8; FGD9].

*"Sometimes we assume the banner invitation is for certain people. Thus, normal people will not understand. The way the information is shared is important."*

Participant No.62, FGD9

*"Most of the time, the program held by the authority is technical and according to protocol. When it is protocol-centric, laypersons will less likely come. It is more inviting if done informally; thus, the gap between authority and people is closer."*

Participant No.58, FGD8

Nonetheless, participants from all FGDs concurred on the need for the method of engagement to be exciting and frequent to encourage the community, particularly the low-income segment, to participate actively.

*"...interactive programmes are more attractive to the community than a forum or exhibition. meaning, if any question needs to be asked, the community can directly ask and discuss with the public officer."*

Participant No.4, FGD

Notably, the public hearing committee was membered by state-level officials (**Table 4**). Local-level officials or representatives were absent, thus influencing the committee's judgement and decision. It was ambiguous to the public on how an objection was evaluated and considered, hence, the public believed that the committees lacked local knowledge. The efficacy of the decision made by the committee on the objections was questionable.

**Table 4:** Public Hearing Committee Membership

LP Johor Bahru 2020		LP Johor Bahru 2020 (Alteration)		LP Johor Bahru Kulai 2025	
Director of Johor Economy Planning Unit	Chairman	Chairman of Local Government and Housing Committee of Johor	Chairman	Chairman of Local Government and Housing Committee of Johor	Chairman

Director of State Development	Member	Director of Johor Economy Planning Unit	Member	Director of Johor Economy Planning Unit	Member
Land and District Administrator	Member	Director of Land and Mineral of Johor	Member	Director of Land and Mineral of Johor	Member
n/a	n/a	Director of Urban and Rural Planning of Johor	Secretary	Director of Urban and Rural Planning of Johor	Secretary

Source: Zanudin (2020)

### Scope of Community Participation in Planning Permission

Following the analysis of 12 mixed development applications retrieved from the LPAs in Johor Bahru and Kulai, it is comprehended that the LPAs in Johor Bahru and Kulai do consider the well-being of the low-income segment in granting planning permission. One of the main aspects considered is the provision of affordable and low-cost housing and commercial units in a new development guided by the *Dasar Perumahan Rakyat Johor* (DPRJ) (Table 5).

Table 5: Justification for Planning Permission

Housing & Commercial Provision Conform to <i>Dasar Perumahan Rakyat Johor</i>	Incidence
<i>Dasar Perumahan Rakyat Johor</i> 's unit is provided less or not conforms to <i>Dasar Perumahan Rakyat Johor</i> . The state government charges a penalty.	7
<i>Dasar Perumahan Rakyat Johor</i> 's unit are provided conform to <i>Dasar Perumahan Rakyat Johor</i>	5
Justification for Approval	Incidence
Adhere to the National Physical Plan	1
Adhere to the State Structure Plan	12
Adhere to the Local Development Plan	12
Adhere to planning guideline	12
Adhere to <i>Dasar Perumahan Rakyat Johor</i> 's requirement	5

Source: Zanudin (2020)

It is notable that the LPAs tend to consider the technical aspects in the decision of the planning permission. The development plans and guidelines hold significant weight in the LPAs, influencing the decision-making. In addition, DPRJ is implemented as part of the tools for planning permission in IM.

**Table 6:** Information & Process Accessibility to Community

<b>Availability of Information to Community</b>	<b>Incidence</b>
Information is accessible to the community during decision-making.	1
Information is accessible to the community after the decision is made.	11
<b>Medium for Information Sharing</b>	<b>Incidence</b>
Discussion with the community leader.	1
Signage is erected on site after approval.	11
<b>Type of Information Accessible to Community</b>	<b>Incidence</b>
Application background.	12
Type of development.	12
Decision made and its justification.	1

*Source: Zanudin (2020)*

**Table 6** demonstrates that the community has limited access to the information and planning permission process. Eleven of the 12 applications have stated that communities only learned of any new development around their area after signage was erected on-site, which was already late for the community to object or influenced the decision. Only one application involved informing the community during the decision-making process of a planning permission due to the large scale and impact of the proposed development that may affect the income of the fisherman community around the proposed area.

From the 12 applications gathered, only two applications involved community engagement, which were during the decision-making and after the decision was made. The absence of community engagement at the earlier stages of the process is associated with the degree of accessibility relished by the community (**Table 7**).

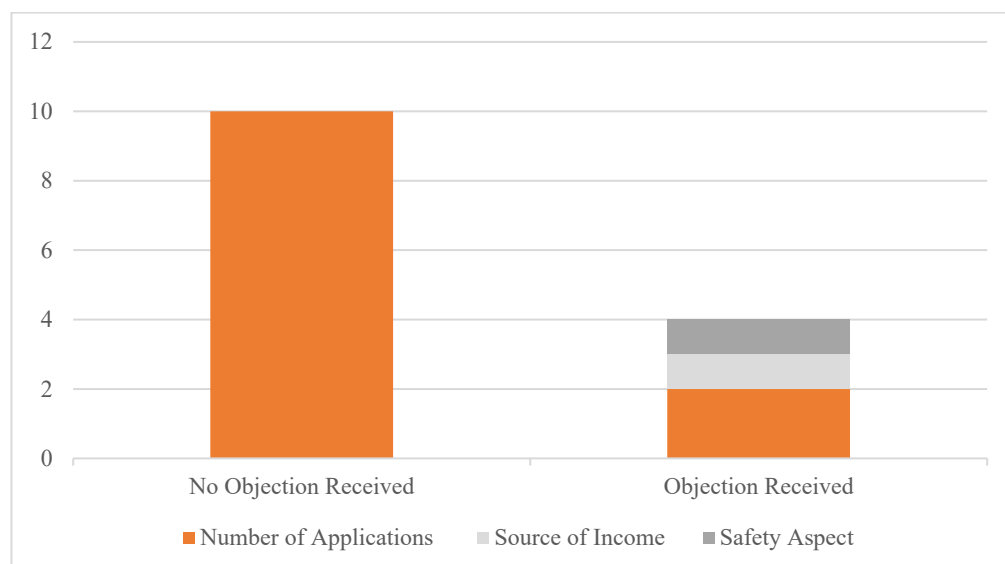
**Table 7:** Stage of Community Engagement in Planning Permission

<b>Stage of Community Engagement During Planning Permission</b>	<b>Incidence</b>
There is an absence of community engagement	10
Community engagement occurs during the decision-making	1
Community engagement occurs after a decision is made	1

*Source: Zanudin (2020)*

There are objections submitted following each community engagement (**Table 7**). Based on the secondary data, the objection concerns the source of income for the fishermen's community. Another objection received is related to the position of the proposed sewage treatment plant that is close to the existing residential area, which potentially affects their well-being (**Figure 3**).





**Figure 3:** Number and Type of Objections by Neighbouring Community  
 Source: Zanudin (2020)

The findings from document analysis indicated that the limitation of information had affected the capability of the neighbouring community to be involved in the planning permission to exert their concerns. A similar argument is highlighted in previous research (Brown & Chin, 2013; Bryson *et al.*, 2012; Mustapha *et al.*, 2013; Zanudin *et al.*, 2019).

Correspondingly, participants in eight FGDs emphasised the importance of collaboration between stakeholders to approve development applications [FGD1; FGD2; FGD3; FGD4; FGD5; FGD6; FGD7; FGD9]. They believed it is essential for the local authorities and private developers to utilise local experiential knowledge. Nevertheless, the current planning permission process appears to be a direct negotiation between the private developer and local authorities [FGD2; FGD4; FGD7].

*"It is important for the developer to have a good relationship with the community to ease the discussion and communication between both sides."*

Participant No.30, FGD4

*"It is not our intention to object to future development, but when a developer wants to propose a new development, they should involve the community representative, local authority representative. Initially, we should discuss and solve any*

*potential issues. When there is established community living in the area, there tend to be issues and disputes that will occur after new development."*

Participant No.52, FGD7

Meanwhile, all applications have consistently noted the same participants and actors involved in deciding on the applications (**Table 7**). Each decision-making stage is chaired by a Mayor or *Yang Dipertua Majlis*, whom local councillors will advise. Internal and external agencies are responsible for advising on the technical aspects of an application. In contrast, local councillors, as the representatives of the community, are responsible for representing the interests of their community in decision-making.

**Table 8:** Participants in the OSC Meeting

<b>Participants in Decision-Making</b>	<b>Incidence</b>
Mayor/ <i>Yang Dipertua Majlis</i>	12
Internal Agencies	12
External Agencies	12
Local Councillors	12

*Source: Zanudin (2020)*

Based on the analysis, participants in seven FGDs agreed that the community communicate with the local authority through their local councillor [FGD1; FGD2; FGD3; FGD4; FGD5; FGD7; FGD8;]. The community interest is brought forward to the local authority by the local councillor.

*"...local councillor is responsible for bringing up our concern to the local authority and sharing the information with us."*

Participant No.52, FGD7

*"Local councillors should be aware of the condition of their community as well as the local authority's plan for their area. They should frequently involve in programs that are held in their locality. Through this program, they can use it as a platform to share any information with the community."*

Participant No.52, FGD7

From the findings, it is indispensable for a local councillor to constantly engage with their community to gain the necessary local knowledge. This can

help the councillors to represent their locality (Marzukhi, 2020; Bryson *et al.*, 2012; Michels & De Graaf, 2010); Zanudin *et al.*, 2019).

Finally, the appeal board is another avenue for the public to challenge the operational decision made by the LPA. Based on all 12 mixed development applications gathered, it is apparent that this avenue is only accessible to the applicant. Data gathered displayed that none of the mixed development applications involved the appeal board (**Table 8**). It is unclear how useful the function of the appeal board is in deliberating the applicant's and community's interests.

**Table 9:** Involvement of the appeal board

Appeal Board	Incidence
Not Applicable	12
Applicable	0

*Source: Zanudin (2020)*

## DISCUSSION

The results indicate that currently, the participation of the community in development plan-making and planning permission in IM, especially among the low-income segment, is minimal compared to the other actors. These results address the research question, "to what extent does the current participatory platform in Iskandar Malaysia offer a genuine opportunity to the low-income segment to participate in the planning and operational decision-making?". Planning and operational decisions appear to be made based on technical factors and top-down approaches.

Following the analyses of data collected from planning documents and FGDs, several issues concerning the current practices of community participation in the planning process in IM have been identified. It seems that the LPAs, specifically in the Johor Bahru and Kulai districts, still depend on conventional methods for communication and engagement (**Table 2**). It is indicated that the usage of newspapers and banners for information sharing has not reached the community, especially the low-income segment. The technical incompetence of the layperson, particularly the low-income segment, has influenced their understanding of the information shared. The concentration of publicity programs at the authorities' buildings and a few other less-accessible locations has failed to generate high and inclusive participation.

**Table 3** indicates that publicity programs only attracted specific stakeholders and community segments. An average of 43.3% of the total objectors were among the private sector, followed by high and middle-income households with an average of 40% in the respective LPs. The data is validated by the findings of FGDs, where participants in the eight FGDs agreed the LPA

did not provide sufficient access to the low-cost apartments' residents to participate in the planning process [FGD1; FGD2; FGD3; FGD4; FGD6; FGD7; FGD8; FGD9]. Therefore, the LPA needs to conduct exciting and frequent engagements with the community segment to improve their participation.

The willingness of the public planner to go the "extra mile" in engaging with the low-income segment can enhance their participation. In LP Johor Bahru Kulai 2025, the public planners have directly engaged the community in Kampung Pok, Skudai and Rumah Pangsa Cendana (**Table 2**). Thus, a slight increase in the number of objectors among the low-income segment has been witnessed (**Table 3**).

**Table 7** indicates the absence of community engagement in operational decision-making. The community's lack of access to information on planning permission is due to what has been underlined in TCPA 1976. Since most of the local areas in IM are gazetted with LP, it has limited the possibility for the neighbouring community to be informed of new development around their area. It is up to the public planner's judgement to inform the neighbouring community (**Table 7**). Engaging the neighbouring community during the decision-making will allow the community to incorporate their local experiential knowledge, hence solving potential conflicts [FGD1; FGD2; FGD3; FGD4; FGD5; FGD6; FGD7; FGD9].

Based on **Table 4** and **Table 7**, it can be comprehended that both planning and operational decision-making are dictated by the technical perspective of the public sector. From the perspective of development plan-making, although the community participated in the publicity programs, their involvement can be categorised as tokenism. Even though the objectors were invited to the inquiry and hearing session, the session is dominated by state officials. Their judgement thus is questionable due to the lack of local knowledge. There is a possibility that the assessment causes the committee to lean towards the state's interests.

In addition, the planning permission process appears to be a direct engagement between the LPA and the applicant. Community involvement in planning permission depends on the public planner's judgement. The opportunity for the community to exert influence in operational decision-making depends on the representation of the local councillors (**Table 8**). It depends on the technical competence and knowledge of the local councillor to ensure that the decision is deliberated based on collective interest. There is a great chance that a decision is made purely based on the rational thinking of the technical agencies.

## **CONCLUSION**

This paper contributes to the continuous debate on the effectiveness of the community participatory process in urban planning as a vehicle for incorporating

the community's interest into planning and operational decisions, hence producing a greater living environment for the community, predominantly the low-income segment. Thus, this study examines the current state of the low-income segment's participation in the development plan-making and planning permission processes in IM.

The researcher evaluated the state of the low-income segment's participation in the gazetted LPs of Johor Bahru and Kulai and the approved planning permission by employing document gathering and document analysis. In addition, FGDs and thematic analysis were selected to analyse the primary data, hence substantiating the document analysis findings. The results indicated that currently, the participation of the low-income segment in development plan-making and planning permission in IM is very limited compared to the other actors.

The limitation of knowledge and awareness among the low-income segment in IM is associated with the employment of conventional methods for communication and engagement. The concentration of publicity programs at authorities' buildings and a few other locations also contributed to the state of participation among the low-income segment. In addition, it is related to the attitude of the public planner in treating the participatory process. The willingness of public planners to go the "extra mile" to communicate and engage with the segment can contribute to improving their knowledge and awareness.

Regarding collaboration, the participatory platforms provided in development plan-making appear to be tokenism. Although objectors are invited during the inquiry and hearing session, the dominance of the state government in the committee has resulted in their judgement being questioned. The Public Inquiry and Hearing Committee seemed to lack local knowledge due to the absence of local officials in the committee. Likewise, no collaboration is formed in the planning permission process as the process is a direct engagement between LPA and the applicant. Therefore, chances for the community, especially the low-income segment, to exert their influence are through their local councillor.

It is anticipated that the study's findings will help policy-makers and decision-makers address the shortcomings of the current practice, hence promoting genuine participation by the community, especially the low-income segment. Subsequently, a few areas can be addressed in the future, including replicating the study using the quantitative research method as it may result in different outcomes due to its statistical attributes.

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## **SUSTAINABLE SPATIAL SETTINGS OF KUALA KUBU BHARU**

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### **Abstract**

Cultural heritage landscapes present historical and cultural civilization signs and legacies in their environment. These landscapes are also considered necessary incentives to attract tourists. Cultural heritage conservation provides tools for reaching suitable solutions for sustainable development based on tourism. Subsequently, the significance of societal identity and way of life in the past was crucial to explaining the current cultural and social dynamic. Determining the value of heritage is especially important to plan the form of its protection, conservation, and contemporary use. The study aimed to assess and evaluate cultural heritage landscape conservation in sustainable spatial settings. This study used qualitative methods by field measurement/survey interview and site observation. The findings revealed that the cultural heritage landscape value presents historical and cultural civilization signs and legacies in the environment and landscape of the sustainable spatial setting of Kuala Kubu Bharu. This study hopes to help local authorities and related agencies restructure baseline data in planning for sustainable spatial settings and appropriately develop and maintain their historical values and natural ecosystem.

**Keywords:** Cultural heritage, landscapes, conservation, spatial settings, sustainable

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## **INTRODUCTION**

A cultural landscape is a spatial form and the physical setting of the built environment, shaped and created by the society's shared beliefs and activities. It comprises both the built and natural environment that must be studied simultaneously in a research procedure (Thompson & Kent, 2017). Similarly, according to Rapoport (1990), the cultural landscape also comprises the dimension of spatial and temporal aspects in the settlement establishment process. For instance, Antrop (2005) stated that the study of cultural landscapes helps enhance the decision-making process for future urban development planning using the explanation of the local lifestyle and the pattern of the cultural attributes which change the physical settings of the local areas.

Cultural heritage landscapes present historical and cultural civilization signs and legacies in their exceptional surroundings and landscapes, which are considered today as necessary incentives to attract cultural tourists (Behbahani, Pajouh & Bostanban, 2017). A cultural landscape is a physical representation of how humans have related to and transformed their environment; it highlights the significance of the building form, natural features, and the interaction between the two (Misni & Aziz, 2015; Pajouh, Bakhsh & Mohammadi, 2013; Tengberg et al., 2012). They added heritage values and cultural identity to two out of the six categories of cultural landscape services that are recognized through many assessments. The others are spiritual services (sacred, religious, or other forms of spiritual inspiration derived from ecosystems), motivation (use of natural motives or artifacts in art, folklore, etc.), aesthetic appreciation of wild and cultivated landscapes, as well as recreation and tourism. Overall, culture needs to be conserved to maintain a social life sustainably.

### **Spatial Settings**

Spatial is used to describe things relating to areas in the context of sustainable development of the site. Tangible and intangible heritage within the landscape help maintain meanings and a sense of collective identity, emphasizing the intimate linkage between cultural heritage and identity (Pătru-Stupariu, Pascu & Bürgi, 2019). The setting is both spatial, either place or space, and temporal. A set can be scenery against which characters exist and move, or represent a symbolic force acting upon the feelings and reinforcing narrative elements (Joshua, 2018). Besides that, different aspects of spatial features contain parts of physical and cultural interactions, namely, contextual factors of social change; cultural aspects of settlement; the conceptualization of cultural landscape, and the taxonomy of cultural landscape from the perceptual theory (Shen & Chou, 2021; Pajouh et al., 2013). Cultural identities are highly associated with the dynamic of the cultural landscape. Spatial settings of newly developed urban areas should consider the local livelihood and residents' inherited pattern of belief and ritual



practice reflected upon the planned cultural landscape (Nunta & Sahachaisaeree, 2010).

### **Cultural heritage landscape (CHL) conservation**

According to Pajouh et al. (2013), several cultural features may be found within a cultural heritage landscape. The region of villages in different climates and geography has recognized some of these features and used various tools to protect them and apply significance. The significance of each CHL attribute/indicator will be evaluated based on three-pronged approaches (Waterloo, 2013). A CHL's indicators help contextualise, cluster, and connect the individual cultural heritage resources.

**Table 1:** CHL conservation for sustainable development

No.	Attributes/indicators	Sustainable Cultural heritage features
1.	Views sheds	A line-of-sight from a specific location for landscapes and as a sequence of views/panorama from a given vantage point
2.	Heritage Conservation Districts (HDC) Making	HCD is to protect buildings. Any changes to property within a heritage conservation district require a permit from the local municipality.
3.	Significant Valley lands	Valley lands are significant due to their function as early transportation corridors, sources of fresh water, and places where businesses and settlements formed.
4.	Human Heritage Routes	Historic trails, historic waterways, historic highways, or scenic driving routes

*Source: Modified from Pajouh, Bakhsh & Mohammadi (2013)*

For this study, CHL conservation provides a means to conserve groupings of cultural heritage resources with greater heritage significance than their constituent elements or parts. The cultural heritage landscape conservation features for sustainable development solutions based on spatial settings can be seen in Table 1. A CHL has property-based cultural heritage resources and attributes that may not be linked to real property (i.e., views of and vantage points, circulation or street networks, land use patterns, architectural details, natural features, and vegetation) (Yusof et al., 2007). Pajouh et al. (2013) listed in Table 1 the attributes/indicators that are suitable for collecting data in KKB cultural areas. As a result, the conserved CHL is more valuable than the sum of its parts (Waterloo, 2013). Similarities of the existing attributes located in KKB needed to be surveyed and evaluated. Therefore, this study focused on determining and evaluating the spatial organisation of landscape about the functional behavioural settings of the local community assessed and integrated into spatial and physical planning. Gabriel (2020) stressed that a heritage town such as KKB is one of the best nominees to represent the whole cultural landscape of the region. This kind

of setting has architecture, texture, and lifestyle, which was built in a particular period. Hence, it is known as heritage.

### **Sustainable development context for cultural heritage and natural resources**

Sustainable development is a development that meets the needs of the present generation without compromising the abilities of future generations to meet their own needs (Throsby, 2002). The principles of sustainability have already been acknowledged in economic development related to resource use through a broadened concept of sustainable development including environmental, economic, social, and cultural aspects (Grazuleviciute, 2006). In a broader context, the role of cultural heritage becomes evident in the part of sustainable development (Loulanski, 2007). Historic buildings and cultural landscapes are elements that create a sense of belonging to a place. Moreover, cultural heritage is not only valuable to individuals who own its historic properties. It can also add value to the community's well-being and quality of life to reduce the effects of cultural globalisation and be an incentive for sustainable development (Misni et al., 2015; Grazuleviciute, 2006). Another essential role of cultural heritage in striving for sustainable development is its relation to resource productivity and economic development. Therefore, preserving cultural heritage is vital to sustainable development while demonstrating positive economic benefits.

### **METHODOLOGY**

A qualitative method was employed to conduct this study. The field measurement/survey was carried out through site observations of cultural heritage landscape conservation in the context of sustainable spatial settings of KKB.

#### **Area of Study**

KKB is located in the Northern Part of Selangor in the Sub-District of Ampang Pecah under the Administration of Hulu Selangor District Council. The study area of KKB is in a strategic location, i.e., approximately 66 km from Kuala Lumpur, 21 km from Tanjung Malim, and 10 km from Rawang, as shown in Figure 1. KKB is naturally situated at the foothill of the famous Titiwangsa Mountain Range and is well known as one of the vital water catchment areas for the state of Selangor. The primary function of KKB is as an administrative centre, as all government buildings are situated in the main town area. The KKB still maintains its green physical characteristic, while residential quarters and various government institutions remain in the area's urban character while preserving its heritage. In addition, KKB is also a transit point for visitors heading to Fraser's Hill. According to RKKBKKB 2025 (2016), the current population in KKB is 14,860 people, estimated to increase to 17,680 people at the end of the year planning 2025.



**Figure 1:** The location plan of KKB in Hulu Selangor District with the Latitude  $3^{\circ} 33' 36.3780''$  N and Longitude  $101^{\circ} 39' 29.9160''$  E  
*Source: RKKBKKB (2019)*

### Site observation in shaping the cultural landscape

Site observation is defined as viewing and recording the actions and behaviours of the physical setting and community at KKB. In this study, the researcher adopted this method to determine the cultural landscapes that could be assessed and integrated into the spatial and physical setting, which are sensible and replicable procedures for collecting data (Chakravarty, 2021). During the site visit and fieldwork measurement and survey, photos, videos, and the current condition of the area were collected, measured, surveyed, and recorded in the research study as valid evidence of data collection on-site. The current situation is related to variables within cultural features in KKB, such as viewsheds, significant valley lands, heritage conservation district making, and human heritage routes. Referring to Pajouh et al. (2013), some areas involved with the cultural and spatial setting in KKB are close by and were evaluated using eight indicators and distinctions.

### **Semi-structured survey with targeted groups of respondents**

A semi-structured survey was used in this study. It consists of several key questions that help to define the areas to be explained. It also allows the interviewer or interviewee to avoid pursuing an idea or response in more detail. The questionnaire survey was carried out to gather and compare three target respondents' groups with different perspectives, opinions, and knowledge from various experts, with a total of 32. The first respondent group consisted of qualified professionals and experts from various agencies related to the development and management of the KKB district. These agencies were Hulu Selangor District Council (Town Planning Department and Landscape Department) and Hulu Selangor District/Land Office (Community Leader Management Council/MKKB). Then, the second target respondent group was the stakeholders and local people of KKB. The last group involved those from the private sector and local tourist agencies relevant to the involvement of KKB's sustainable spatial setting with tourism activities.

### **Data Analysis**

The present researcher conducted qualitative research by systematically searching and arranging observation notes or other non-textual materials that were accumulated to understand the phenomenon in KKB. The analysis of the qualitative data involved categorising the data, identifying significant patterns, drawing meaning from data, and subsequently building a logical chain of evidence. This method provided the initial impression and evidence of the current situation. It generally offered a list of site studies by analysing its resources and capabilities.

## **RESULTS AND DISCUSSIONS**

The results of the KKB study area were based on the importance of preserving history and heritage in the context of sustainable spatial settings arrangement.

### **History of Kuala Kubu Bharu**

KKB is a rebuilt city after the old town Kuala Kubu was destroyed in floods between 1883 and 1926. KKB has a high historical value based on the city's role in the past and its position as a gateway to Pahang. It has a clean, green, and airy feel to become the first Garden City in Malay Land (PESKUBU, 2016). The original town was Kuala Kubu and was well known for tin mining activities in Selangor (RKKBKKB, 2019). It used to be the fort of Raja Mahadi when he fought with Tengku Kudin during the Selangor civil war from 1868 to 1873. Unfortunately, this town was destroyed when the Kuala Kubu dam burst in 1883, killing 35 people (PESKUBU, 2016). After the tragedy, the British government decided to build a new town near the remains of Kuala Kubu.

The new town was named KKB, with Bharu meaning "new" in Malay. Residential houses have been developed since the 1980s in the previously abandoned old town of Ampang Pechah. The redevelopment of Ampang Pechah was a natural progression of the organic growth of the new township of KKB. Currently, the town of KKB has been identified as the Garden City, potentially to be appointed as a constituency interest at the national and international levels. The concept emphasises elements of urban landscaping, beautification, and security in urban areas. Visitors who come to KKB can experience the green and beautiful scenery against the backdrop of the hills and appreciate the historical effects.

### **Cultural Landscape Features of KKB**

Pajouh et al. (2013) added four cultural features within a cultural heritage landscape: viewsheds, heritage conservation districts, significant valley lands, and human heritage routes. Below are features of analysis and tools available to strengthen the study of the cultural heritage landscape of KKB.

#### **a. Viewsheds**

The topography of KKB is toward the green mountains of the Titiwangsa range. The difference in altitude between the mountains sees the perspective and vista. KKB has an elevation of around 50 to 125 metres, and the height decreases towards the south. Following nature's law of gravity, water also descends from the mountain peaks to the lowest elevation in the area. The three rivers found in the study area are Kumbang, Kubu, and Kelempong. The topography is mostly flat in the middle except for Taman Bukit Kerajaan. The highest point is at the northwest of the site, which is 124 m in elevation and near the commuter station, while the lowest point is 56 metres at the quarters housing area.

#### **b. Heritage conservation districts**

To support the direction of KKB as the Areas of National Interest or World Heritage, it was recommended that the boundaries of the Special Area Plan 2025 have two control layers of conservation areas. According to UNESCO (2019), there are two proposed zones, core and buffer. IUCN (2011) also stressed that absolute determination of core and buffer zones is the most critical element in detailing the control mechanism development to protect the area's integrity. These are justifications for determining the location, historical interest, and development boundary. Indeed, heritage conservation districts, similar to cultural heritage landscapes, will protect buildings and the surrounding landscape, including their features in a contiguous way.



Figure 2: The old town of KKB now retains all its heritage buildings and streets.

### c. Significant valley lands

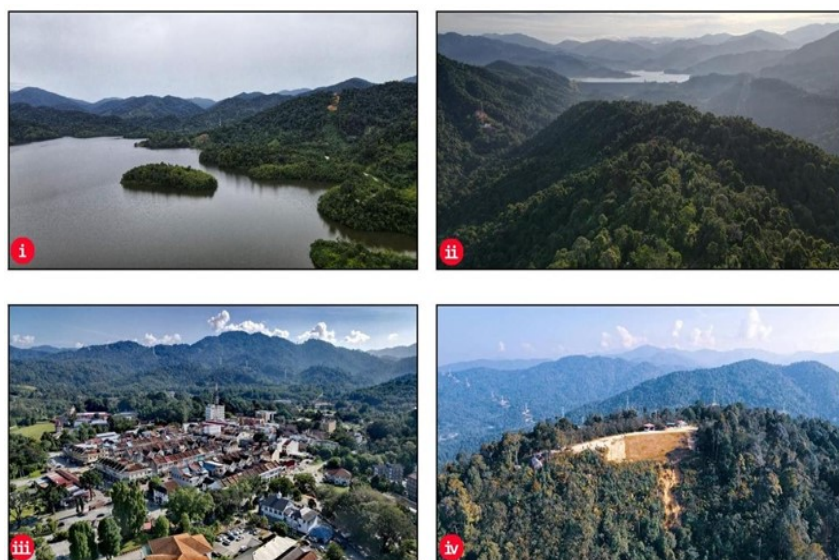
As for natural elements, the cultural heritage landscape is considered a necessary incentive to attract cultural tourists. The green environment, rich with flora and fauna, gives practical added value to KKB. Among the natural elements, the area around Sungai Selangor Dam towards the road to Fraser's Hill was given more focus. Based on the observation, the Selangor River Dam covers an area of over 600 hectares and has a storage capacity of over 235 million cubic metres. It is well known as one of the vital water catchment areas for the state of Selangor. The area offers tourism activities with natural elements rich in natural resources. The locations should apply conservation of cultural heritage landscapes in the context of sustainable development so that they can be preserved naturally for future generations.

### d. Human heritage routes

According to the SSP of 2035, KKB Town has been categorised as the Sub-Regional Center. This is the third hierarchy of the Growth Center and Partial of Strategic Development of Selangor after the Country and the State Regional Center. From the context of the development zone of the existing state, KKB Town is part of the "Scenic Development Network" Selangor, from the Networking aspects region. The town is also the secondary transit centre connecting Selangor, Fraser's Hill, and Tanjung Malim, Perak. The cultural

heritage landscape provides an analysis of cultural heritage, and its content is linked to the concepts of landscape, heritage, and identity.

Urban form analysis considers three aspects of influence: natural, physical, and social consequences. These aspects can be classified into several components of town development. Tourism and recreation are most known because KKB is famous for outdoor spaces with natural features and historical structures. This sector can transform cultural values into economic ones. The area of KKB has been categorised into three for tourism; ecotourism, agro-tourism, as well as heritage and culture tourism. It produces new employment and wealth for the locals. Hulu Selangor District Council authorities can provide more facilities to attract more tourists to KKB. As for the policymakers, these can provide valuable information about the economic impacts, contributing to sustainably orienting strategic choices.



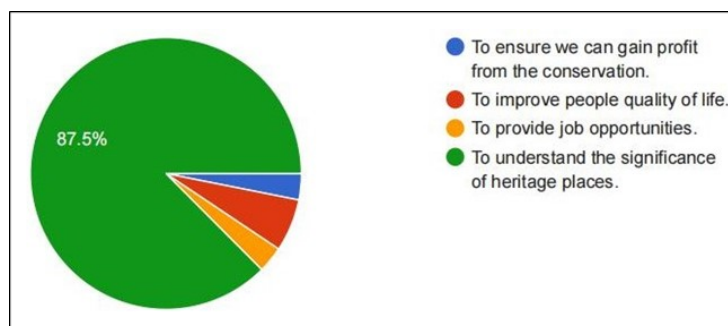
**Figure 3:** (i) - (ii) Scenic view of the Selangor River Dam, (iii) KKB is located at the foothill of the famous Titiwangsa Mountain Range, and (iv) The flight takes off for paragliding activities at Batu Pahat Hill.

### **Cultural landscape conservation in a context of a sustainable spatial setting**

This analysis produced findings that were derived from an interview survey. The responses were analysed, focusing solely on presenting the gathered data in a meaningful way.

**i) The understanding of cultural heritage landscape conservation in the context of sustainable spatial settings**

The majority of the respondents, which stood at 90%, indicated that cultural heritage landscapes present a process of evolution in their form and component featuring exceptional surroundings and landscapes considered today as a necessary incentive to attract cultural tourists. Moreover, cultural heritage landscapes present a process of evolution in their form and components featuring exceptional surroundings and landscapes considered today as a necessary incentive to attract cultural tourists. These indicate that the respondents' understanding and perception of understanding Cultural Heritage landscapes in the context of sustainable spatial settings in KKB were at an excellent level. Meanwhile, in terms of heritage, almost all respondents (91%) thought that heritage elements should be preserved so that people know their roots and can maintain national identity and pride. This can be analysed through the respondents' understanding of realistic goals regarding the sustainable cultural heritage landscape. It is related to the nation's dignity and identity. Most respondents also felt that understanding the significance of heritage places is the most critical, which stood at 88%, as shown in Figure 4. This is because they acknowledged the importance of preserving the value of cultural heritage sustainably. In other words, the respondents were aware of their understanding of the goals and objectives of preserving their cultural heritage in KKB.



**Figure 4:** The importance of Cultural Heritage Conservation in KKB

The findings also revealed that identifying landscape factors such as aesthetics, recreation, culture, economics, education, and history is most important. Respondents' understanding of these factors can be identified through the majority of answers which stood at 63%. In addition, landscapes and features are important because they contribute significantly to sustainable well-being and quality of life, as shown in Figure 5.



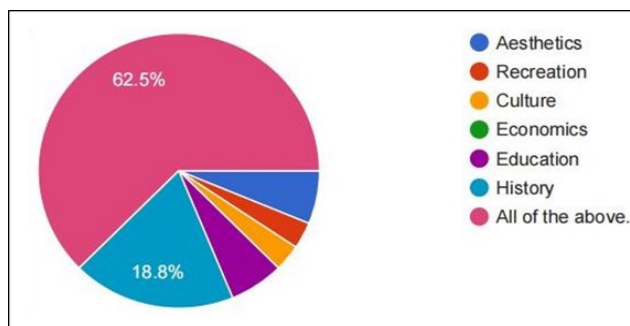


Figure 5: Landscape identification in KKB

### ii. The sustainable cultural heritage landscape conservation in KKB

Figure 6 displays 18 respondents who agreed that tourism is the best activity in social-cultural spaces of sustainable spatial settings in KKB. On the other hand, 15 respondents mentioned that recreation and leisure are the best activities when coming to KKB. There are eight routine activities: shopping, trading, working, visiting, gathering, recreational/leisure, eating places, and tourism. Each respondent could choose five indicators representing a decision: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. It was found that tourism had the highest rating and was highly recommended to be the potential tourism sector as a routine activity in the sustainable spatial settings of KKB. Recreation and leisure are also the second most recommended regular activities. However, shopping activities were disagreed with because the respondents wanted to maintain the area sustainably, as well as for it to remain peaceful and harmonious without any congestion and crowded places.

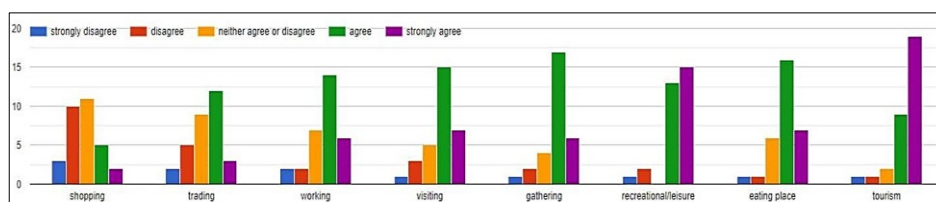


Figure 6: Routine activities were generated as cultural spaces in KKB

Based on Figure 7, 15 respondents revealed that they had access to choose the type of spatial patterns of cultural spaces and mostly considered the heritage trail of KKB. Almost all of the respondents, on average, agreed that all the listed cultural spaces are relevant to visit. Therefore, cultural spaces in KKB are historic towns generated by routine activities such as the dynamic socioeconomic, workplace, and neighbourhood activities. There are eight spatial patterns of cultural spaces: thoroughfare, pocket spaces between old shophouses,

KKB Art and History Gallery, *Dataran* KKB, KKB Hot Spring, Sungai Selangor Dam, KKB Golf and Country Club, and The Heritage Trail of KKB.

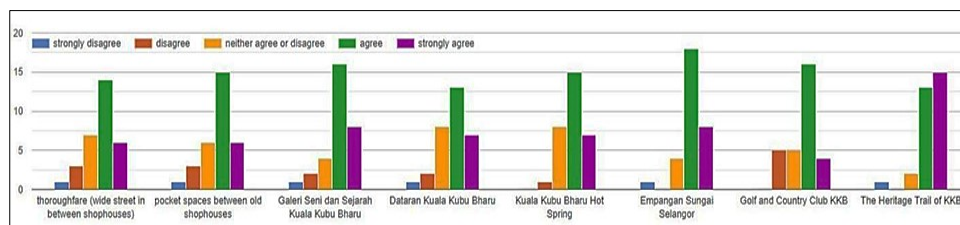


Figure 7: Spatial patterns of cultural spaces in KKB

Each respondent could choose five indicators representing a decision between strongly agree, agree, neither agree nor disagree, and strongly disagree. The analyzed data indicated that most tourists who come to KKB want to explore The Heritage Trail of KKB. Most spatial patterns achieved an average rating in the tourism assessment area, and it caters to local tourists and provides information, as well as history about the town itself. The activities were primarily cultural and educational. All types of spatial patterns of cultural spaces obtained an average rating, which should be improved in the future so that the town is livelier and more vibrant.

The cultural heritage landscape presents historical and cultural civilization signs and legacies in its particular environment and landscape, which is considered today as a necessary incentive to attract cultural tourists. Moreover, it also affects the response process in both cultural landscape changes and physical landscape in KKB. Hence, cultural heritage landscape conservation in KKB features on reaching suitable solutions for sustainable development based on spatial settings. Preserving the heritage is the community's work towards the recovery of collective memory and identity. Through this cooperative effort, social cohesion is created. Finally, the maintenance of social harmony, which implies the recognition and respect for the differences in the cultural identity of each community, is a determining factor in the implementation of sustainable development of KKB.

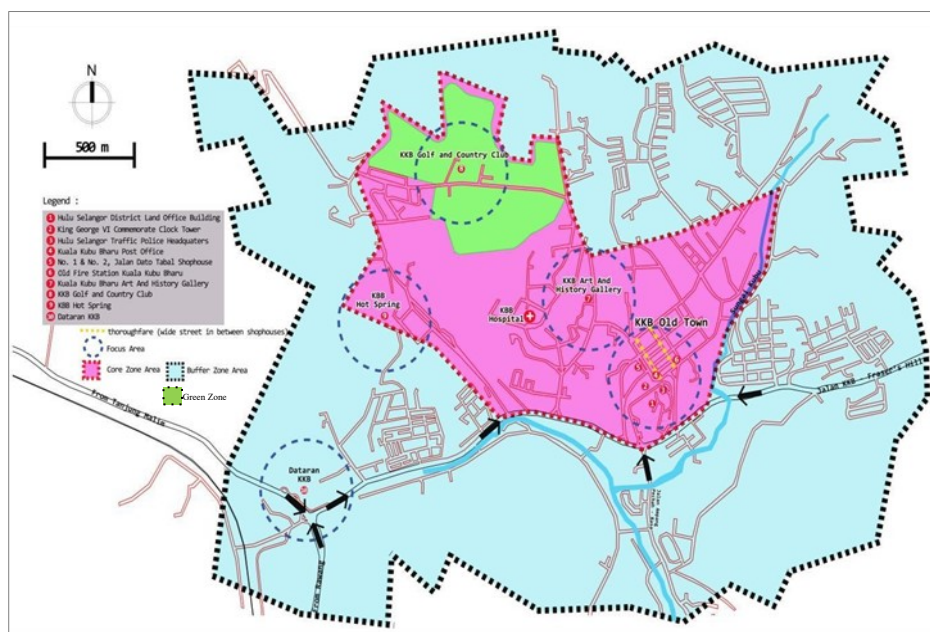
## CONCLUSION

Through eight indicators of CHL conservation of KKB, and four additional CHL features, the analysis of the activities, operations, and spatial setting systems were used in the site to be evaluated. Then, the study discussed features related to strengthening the cultural heritage landscape of KKB. A conclusion was drawn, i.e., the cultural heritage landscape in the sustainable spatial setting of KKB presents historical and cultural civilization signs and legacies in its environment and landscape. They are considered necessary incentives to attract cultural

tourists. Currently, the combination of historical elements and natural setting, together with the ecosystem of KKB provides a unique spatial set in which all the aspects fulfilled the characteristics of the cultural heritage landscape sustainably (Pajouh et al., 2013). Based on these spatial settings, KKB has a solid character to become the first Garden City in Malaysia.

### Zoning protected area

In KKB, it is clear that the conservation of cultural heritage landscapes should be centred in the context of sustainable spatial settings. Besides, it presents the cultural identity, such as norms, functions, social beliefs, social structures, and community economics, which formed a cultural landscape as heritage in time with those involved with cultural landscape indicators. In the future, to sustain the study area, some measures must be taken by looking at the effectiveness of spatial settings that impact the community.



**Figure 8:** The core and buffer zones for the cultural heritage spatial setting of KKB

Figure 8 illustrates the recommended zoning area for KKB. The zoning could be managed into two zones: core and buffer zones. Based on the overall findings, it was found that KKB has a high potential to be a great example of a historical town with rich cultural landscape resources. These crucial aspects must be considered and divided into the central historic area as a core zone and protected by a buffer zone. These two elements (man-made and natural) are to be

considered in determining the buffer boundary to ensure that the future planning is not contradictory and its integrity as a Garden City has not interfered. The spatial aspects indicated that KKB has many potential areas to be promoted to achieve a balance between the district and the surrounding area. The town of KKB should be conserved as it was first implemented as the Garden City in Malaysia and a starting point for Town and Country Planning in Malaysia. Any new development has already been mentioned in the Special Area Plan of KKB, especially in the core and buffer areas. They should not be disturbed due to the identity, and uniqueness of the history and images of the Garden City of KKB. Scenic corridor control is intended to maintain a view of the existing heritage in KKB Town, including the tops of the cities of the surrounding hills, historical monuments, and heritage buildings. Finally, vista retention and protection scenery are essential to maintain:

1. Self-orientation, by keeping in mind particular and unique characteristics,
2. Distinguish a place or area from the others, and
3. Enhance the unique character of KKB as a garden town.

Moreover, it also affects the response process in both the cultural landscape changes and the physical landscape in KKB. Hence, cultural heritage landscape conservation features are suitable solutions for sustainable development based on spatial settings.

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## **THE BENEFITS OF GREEN INFRASTRUCTURE PLANNING IN ADDRESSING LOST SPACES UNDERNEATH ELEVATED URBAN HIGHWAYS**

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### **Abstract**

Traditional planning practices, wherein attention is directed at the provision of single functions or zoning, have led to the emergence of lost spaces in cities like Kuala Lumpur. Elevated highways are a prominent contributor to the formation of these lost spaces and are seen as a hurdle in achieving a sustainable compact city. Studies suggest that green infrastructure (GI) planning, which aims to promote multifunctionality in spatial planning, is a suitable approach to address this dilemma. To identify the benefits of the GI approach in mitigating lost spaces underneath elevated highways in Kuala Lumpur City, this study utilized two methods: site observation and expert interviews. The results suggest that GI planning can achieve benefits ranging from economic aspects, such as increasing property value, to social aspects, such as promoting a healthier urban lifestyle. However, such benefits may vary as these spaces have different typologies in terms of accessibility, size, location, and surrounding context. Nonetheless, the GI approach can be seen as the key to achieving a sustainable compact city, since it supports the ability of urban spaces to provide multiple benefits concurrently. Thus, the identification of its benefits could lead to the more sustainable planning, design, and management of lost spaces.

**Keywords:** urban landscape planning, lost space, green infrastructure, infrastructural landscape.

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## INTRODUCTION

One of the 21st century's most transformative forces is urbanization, which brings with it intense social, economic, and environmental changes and demands (Van Zyl et al., 2021; Pakzad & Osmond, 2016). As this process has accelerated rapidly, so has the demand for more transportation infrastructures, including elevated highways (Bürge et al., 2004; Forman et al., 2003). Due to the nature of planning and the limited space in urban areas, elevated highways are often built in urban peripheries, riverbanks, industrial areas, and low-income housing areas (Biesecker, 2015). The development of this infrastructure type increases the accessibility and mobility of urban dwellers; however, due to its monofunctional manner of traditional planning, it also creates a vast amount of lost spaces and adds to urban sprawl. Thus, the development of elevated highways has resulted in the formation of empty and leftover spaces (Sanches & Pellegrino, 2016; Franck, 2011), a phenomenon which Kuala Lumpur City is currently experiencing (Qamaruz-Zaman et al., 2013; Anuar & Abdullah 2020).

Redefining modern infrastructure requires a multi-disciplinary team of designers, planners, and engineers to fully realize benefits to cultural, social, and natural systems. In relation to this, the United Nations (UN) has strengthened its emphasis on urban areas, as seen in its Sustainable Development Goals (SDGs) announced in 2015 as part of the 2030 Agenda for Sustainable Development. Specifically, the urban goal is expressed in SDG 11, which is to “*Make cities and human settlements inclusive, safe, resilient, and sustainable*” with the support of ten specific targets (Van Zyl et al., 2021; Hansen et al., 2019). Thus, an alternative multifunctional development approach in the form of green infrastructure (GI) planning is seen as the key to sustainable urban development that fulfils the multiple targets set under SDG 11 (Van Zyl et al., 2021; Hansen et al., 2019). Indeed, the application of multifunctional planning solutions to complement or replace traditional urban development approaches is an area of increasing research interest. GI, also termed sustainable infrastructure (Chatzimentor et al., 2020), is now a major transdisciplinary research theme that links geography, ecology, and urban planning (Benton-Short et al., 2019). GI advocates a hybrid network of natural, semi-natural, and engineered features in and around urban areas at various scales, which is curated to provide multiple ecosystem services and benefits to humans that offer environmental, social, and economic value (Pauliet et al., 2021; Choi et al., 2021; Tzoulas et al., 2007; Hansen & Pauleit, 2014). Such benefits include reduced urban heat island (UHI) effects, increased carbon dioxide sequestration, improved water and air quality, better social cohesion, more recreation and tourism opportunities, and higher property values, among many others (La Rossa & Pappalardo, 2021; Choi et al., 2021; Mell, 2016; Naumann et al., 2011).

In general, there have been numerous studies on the overall advantages of GI. However, there is a limited amount of research on its benefits with regard

to vacant or lost space utilization (Kim et al., 2018; Minor & Anderson, 2017; Nemeth & Langhorst, 2014). This is largely attributed to the limited systematic synchronization of its benefits towards the categorization of different types of vacant land. Specifically, few comprehensive studies have looked into how different types of vacant land can collectively contribute to the urban landscape as a whole. Despite its potential, the limited knowledge on the potential uses of different types of urban vacant land suggests that such land is often overlooked and not fully valued as part of the urban landscape. The design, planning, and management of vacant land has been minimal, further indicating that it has been neglected as a valuable resource (Kim, 2016). With this view, the objective of this study was to identify the benefits of the GI planning approach in addressing residual spaces underneath elevated highways, particularly taking into consideration the spaces' various typologies. By delivering a preliminary understanding of GI benefits, this paper also sought to provide insights on the nexus between GI planning and lost space planning and design within the context of Kuala Lumpur City. Prior to achieving these objectives, the current situation of traditional spatial planning and the formation of residual spaces, especially pertaining to elevated highways, should be understood. Thus, this paper begins with a brief discussion on the topic of residual urban space formation caused by traditional spatial planning. This is followed by a review of GI planning as an approach to address residual spaces in urban areas. Next, the methods used in this study are described. The analysis results and discussion are then explained and finally, the study's conclusions are presented.

### **GI PLANNING FOR LOST URBAN SPACES**

Various works of literature have noted that the issue of lost spaces or residual spaces in relation to transport infrastructure is a result of two phenomena: 1) traditional planning; and 2) a lack of integration during the early stages of development, primarily during the planning and design process. The problem of residual spaces caused by traditional planning is indeed a gap that needs to be addressed (Akinci et al., 2016; Mossop, 2006; Prasetyo & Iverson, 2015). Challenges emerging from rapid urbanization require a monumental change in planning processes and practices to holistically integrate ecological dimensions alongside traditional planning interests. In this context, one of the contemporary approaches to resolve residual space problems in the city is GI planning. GI has emerged as a potential concept that may be used to operationalize an ecosystem-services-based approach within spatial planning policies and practices. It moves beyond traditional site-based ideas of 'protect and preserve' towards a more holistic ecosystem, which includes not only protecting but also enhancing, restoring, creating, and designing new ecological networks characterized by multifunctionality and connectivity (Lennon & Scott, 2014). Moreover, the strategy of greening residual, derelict, and vacant land is a suitable opportunity



to enhance the quality of life, leisure, recreation, and social cohesion in the city (Sanches & Pellegrino, 2016). The GI approach can thus be considered an opportunistic one which acknowledges the potential of managing or structuring lost spaces in a different manner to provide specific functions, such as pedestrian paths, cycling paths, or greenways (Ahern, 2007). In distinguishing GI planning from traditional planning, Benedict and McMahon (2012) noted that the main point of difference is that traditional planning is monofunctional, wherein attention is directed at the provision of single functions or zoning; in contrast, GI planning is multifunctional.

Implementing the GI concept in the urban planning process carries important impacts. From the ecological perspective, it can increase the resilience of ecosystems, contribute to biodiversity conservation and habitat enhancement, and relieve pressures on the environment resulting from human activities, such as habitat fragmentation, climate change, land use change, and agriculture intensification (Pakzad & Osmond, 2016). In relation to climate change mitigation, greenery can also play an important role in carbon sequestration (Hutyra et al., 2011; McPhearson et al., 2013; Nowak et al., 2013). From the community to city levels, GI provides various types of empirically documented benefits, both directly and indirectly. Its economic benefits include higher land and property value, inward investments, visitor spending, environmental cost-saving, health improvement, market sales, and employment generation (Donovan & Butry, 2010; Gore et al., 2013; Kim, 2016). The social and cultural benefits associated with GI planning are stronger spiritual attachments, recreation experiences, and aesthetic values. These gains, in turn, may catalyze greater community engagement within a space (Nemeth & Langhorst, 2014). Additionally, the exposure to nature and real or perceived biodiversity through GI may be advantageous to people by improving their psychological well-being, physical health, and cognitive function (Anderson & Minor, 2017; Kim, 2016; Nemeth & Langhorst, 2014; Sanches & Pellegrino, 2016). Adding to this, the introduction of GI in residual spaces, which entails climatic and microclimatic modifications, brings environmental benefits to locals in terms of UHI mitigation (Armson et al., 2012) as well as enhanced ecosystem services (Gore et al., 2013; Hensen & Pauleit, 2014; Kim, 2016; Pauleit et al., 2017; Sanches & Pellegrino, 2016).

Considering its numerous uses and benefits, GI is seen as a strategic spatial planning framework which integrates adaptation and mitigation objectives (i.e., environmental, social, and economic) with co-benefits for broader sustainable development than that provided by the traditional planning approach of zoning (Choi et al., 2021; Locatelli et al., 2015; Yiannakou & Salata, 2017). For example, a well-managed greening strategy can simultaneously contribute to adaptation by reducing storm water runoff and UHI effects as well as to mitigation by increasing carbon sequestration and decreasing building energy

consumption, all while providing aesthetic benefits and habitats for biodiversity (Godspeed et al., 2021; Mell, 2016). In this sense, evidence from the literature asserts that GI offers alternative interventions in spatial planning that are more flexible, cost-effective, and broadly applicable for climate action compared to the conventional or traditional planning of grey infrastructure (Choi et al., 2021; Vignola et al., 2009). It is in this regard that GI is posited as a suitable planning approach to mitigate and offset lost space issues stemming from traditional planning, particularly related to spaces underneath elevated highways in the city.

**METHODOLOGY** Duta Ulu Kelang Expressway (DUKE - E33), Ampang Kuala Lumpur Elevated Highway (AKLEH - E12), and Maju Expressway (MEX - E20) were selected as case studies for this research. These sites were purposively selected as they represent the largest available residual space underneath elevated highways in Kuala Lumpur City, with a combined total area of 582,793 m<sup>2</sup>. These three elevated highways have various parts that run across not only dense urban communities and neighborhoods but also green areas, resulting in two typologies for the residual spaces beneath them: Typology 1 being easy to access and Typology 2 being hard to access (Anuar & Abdullah, 2020). The classification of the typologies mainly revolved around the spaces' accessibility and current function.

Apart from the case studies, this study utilized data collected from previous case studies of residual spaces underneath elevated highways in Kuala Lumpur City. Based on the data, a set of suitable GI elements were identified for the two major typologies of these spaces (Anuar & Abdullah, 2020). The categories, characteristics, and suggested elements are presented in Table 1. Subsequently, the typology-based environmental, social, and economic benefits of the identified GI elements were investigated through a series of expert interviews. Drawing from a review of several published local and international research works, the general benefits of GI in cities were listed based on environmental, social, and economic aspects. The benefits were then structured and categorized in a scoring sheet before being presented to the interviewees.

**Table 1:** Categories, General Related Characteristics, and Suggested GI Elements in Relation to the Typologies of Spaces Underneath Three Elevated Highways in Kuala Lumpur City

Typology	Characteristics	Category	Suggested GI Elements
Public Space	Access to pedestrians only. Activities and functions are determined by surrounding businesses and people. Designed and maintained by the city's authorities.	<b>Typology 1</b> Easy to Access DUKE - E33	

Public Space with Service function	Most of the spaces are accessible by cars and motorized vehicles. Crammed between two to four roads adjoining the main road axis. Dominated by parking zones and partly furnished with some form of urban furniture. Presence of service space with limited public access.	(Sentul Interchange, Gombak Retention Pond) AKLEH - E12 (LRT Dato Keramat, LRT Damai, Tun Razak Junction)	Playlots, Recreational Lots, Community Gardens, Public Plaza.
Transit Space Hub	Commuter-friendly transit space. Provides shelter in times of adverse weather. Used as hub for transportation (bus/taxi stops)		
Transit Space Circulation	Solely dedicated to vehicular and pedestrian circulation. Presence of traffic lanes with minimal sidewalks and crossings.	<b>Typology 2</b>	Semi-Natural Area, Green Corridor,
Inaccessible Space	Inaccessible to the public, only accessible to private business and mainly used for storage and transportation depots. Oftentimes fenced/gated.	Hard to Access MEX E20 (Salak Selatan – Kuchai Lama)	Functional Green Spaces, Linked to Sustainable Urban Drainage System (SUDS)

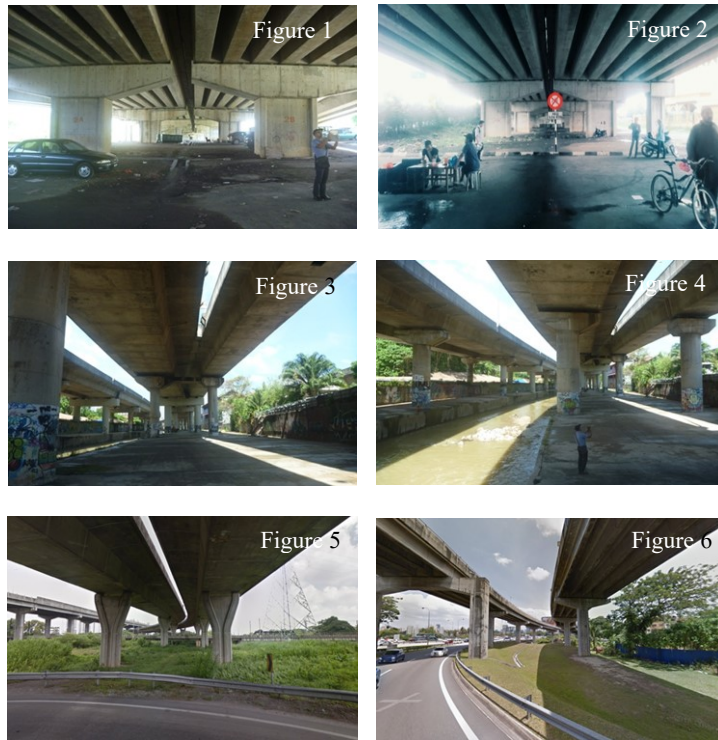
(Source: Adapted from Anuar & Abdullah, 2020)

### Expert Interviews

To gain exclusive insights into the typology-based benefits of GI planning in addressing lost spaces underneath elevated highways, brief but in-depth structured interviews were conducted with 10 experts. The experts comprised academicians with a PhD qualification in landscape architecture and planning, landscape architects with professional certifications and more than 10 years of industry experience, a representative from the Malaysian Highway Authority, and a highway developer. Sourcing expert opinions via interviews is considered a suitable method to gain critical input and reliable feedback on a presented matter (Elliott et al., 2020; Jacobs, 2015).

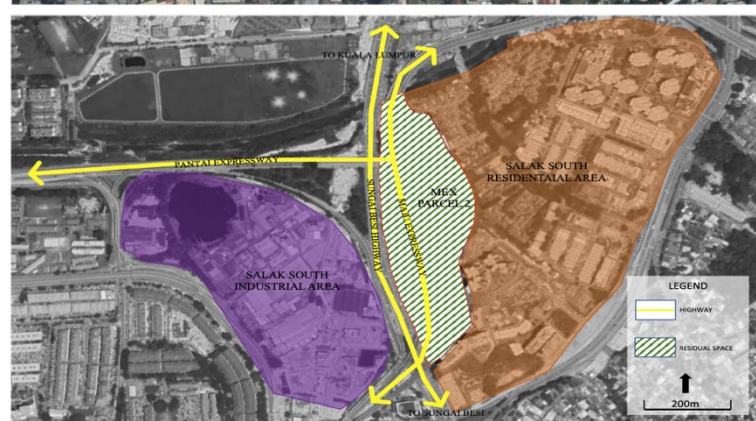
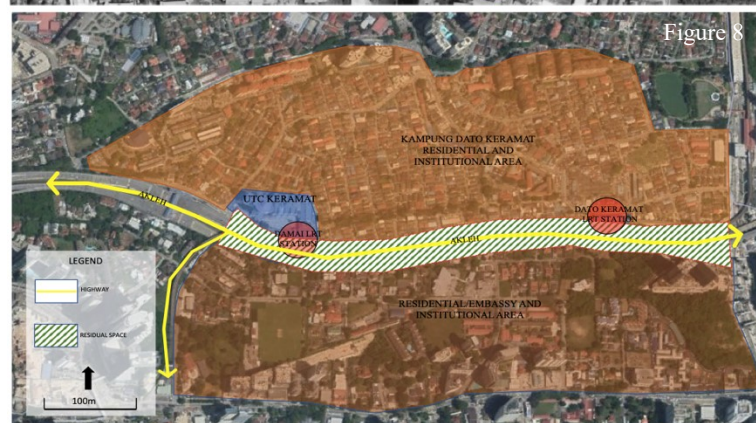
The interviewees were presented a series of structured questions arranged in two sections. The first was the scoring section, which had three sub-sections listing GI's economic benefits, social benefits, and environmental benefits as variables in relation to the two lost space typologies. The respondents were asked to rate these GI benefits with scores from 1 (not beneficial) to 5 (most beneficial). Scores were given based on the projected benefits of each GI aspect's implementation in the reviewed spatial typologies. In the second section, i.e., the general insight section, the interviewees were asked to discuss and clarify their views on their given scores. The respondents were also shown pictures (see Figures 1 to 6) and two-dimensional plans (see Figures 7 to 9) of the case study sites for them to better understand the context and locality of the sites. The interviewees' scores and views were recorded and transcribed. Based on the discussion transcripts, the key factors that encompass the benefits of the GI approach with regards to the case studies' spatial typologies were noted. Following this, the mean scores were calculated for each benefit in line with the

themes raised by the interviewees for Typology 1 and Typology 2. The results and findings from the interview were then descriptively analyzed.



**Figures 1 to 6:** Different typologies and scenarios of the case study sites shown to the respondents to gain their insights on the potential benefits of GI planning in addressing these lost spaces. Figures 1 and 2 depict spaces underneath DUKE; Figures 3 and 4 depict spaces underneath AKLEH; and Figures 5 and 6 depict spaces underneath MEX.

*Source: Author*



**Figures 7 to 9:** Various contexts of the case study sites found and explained to the respondents. Figure 7 shows DUKE (Typology 1); Figure 8 shows AKLEH (Typology 1); and Figure 9 shows MEX (Typology 2) (Salak Selatan – Kuchai Lama)  
 Source: Adapted from Anuar & Abdullah, 2020

## RESULTS AND DISCUSSION

### Benefits of the GI Approach for Residual Space Underneath Elevated Highways

The interviewed experts rated the predicted benefits of the GI planning approach if applied at lost spaces underneath elevated highways according to their spatial typologies. Based on their responses, the key factors in determining the benefits of GI implementation were found to be locality and site context, accessibility, safety, community needs, and approval from the local authority. The mean scores of each benefit are presented in Table 2, wherein the scores range from ‘1 = least beneficial’ to ‘5 = most beneficial’.

**Table 2:** Mean scores of the potential environmental, social, and economic benefits of the GI approach in lost spaces underneath elevated highways based on spatial typology

GI Benefits Environmental Aspect	Score	
	Typology 1 (easily accessible)	Typology 2 (hard to access)
Climate and microclimatic modifications (e.g., UHI effect mitigation; temperature moderation through evapotranspiration and shading; wind speed modification)	4.8	4.7
Air quality improvement (e.g., pollutant removal; lower emissions)	4.5	4.8
Reduced building energy use for heating and cooling (e.g., shade via trees; building covered by green roof and green walls)	4.4	4.3
Hydrological regulation (e.g., flow control and flood reduction; regulation of water quality; water purification)	4.2	4.7
Improved soil quality and erosion prevention (e.g., soil fertility; soil stabilization)	4.4	4.8
Noise level attenuation	4.2	4.7
Biodiversity protection and enhancement (e.g., communities; species; genetic resources; habitats)	4.7	4.8
<b>Social Aspect</b>		
Food production (e.g., urban agriculture; kitchen gardens; edible landscape and community gardens)	4.1	4
Opportunities for recreation, tourism, and social interaction (i.e., community livability)	4.8	3.9
Improved pedestrian paths and connectivity (e.g., higher safety; quality of path; connectivity and linkage with other modes)	4.2	3.7
Improved accessibility	4.2	3.9
Provision of outdoor sites for education and research	4.4	4
Reduction of crimes and fear of crime (e.g., comfort; amenity and safety)	3.2	3.8
Attachment to place and sense of belonging (i.e., cultural and symbolic value)	4	3.6

Enhanced city attractiveness (e.g., more desirable views; restriction of undesirable views)	4.8	4.5
Improved physical well-being (e.g., physical outdoor activity; healthy food; healthy environments)	4.5	4.5
Better social well-being (e.g., social interaction; social integration; community cohesion)	4.1	3.8
Improved mental well-being (e.g., reduced depression and anxiety; recovery from stress; attention restoration; positive emotions)	4.4	4
<b>Economic Aspect</b>		
Increased property values	4.8	4
Greater local economic activity (e.g., tourism, recreation, cultural activities)	4.7	3.6
Healthcare cost savings	4	3.7
Profits from provisioning services (e.g., raw materials; food products; fresh water)	3.5	3.8
Value of less CO2 emissions and carbon sequestration	4.4	4
Value of lower energy consumption (e.g., reduced demands for cooling and heating)	4	4

(Source: Author)

The interview results denote that most of the benefits of GI planning are generally applicable in the lost spaces under study if this multifunctional approach were to be implemented. This is because a majority of the presented variables exhibited high scores in each category (environmental, social, and economic), regardless of typology. Climate and microclimatic modifications (4.8) and biodiversity protection and enhancement (4.7) were ranked the highest among the presented environmental benefits under Typology 1. In terms of social benefits, opportunities for recreation, tourism, and social interaction (4.8) and enhanced city attractiveness (4.8) were the top ranked aspects, while increased property values (4.8) was the top-scoring economic benefit (see Figures 10 and 11). As for Typology 2 (see Figures 12 and 13), the results highlight that the top ranked benefits pertained to the environmental aspect, with air quality improvement, improved soil quality and erosion prevention, and biodiversity protection and enhancement scoring an average of 4.8 respectively. When viewed by theme (i.e., environmental, social, economic), Typology 1 spaces appeared to greatly benefit from social advantages with an average score of 4.5, whereas Typology 2 spaces were found to mainly benefit from the environmental aspect with an average score of 4.7. This is explained by the fact that spaces under Typology 2 are somewhat hard to access, thus limiting social opportunities there. Although the scores were relatively high, with total average scores for all benefits at 4.35 for Typology 1 and 4.15 for Typology 2, further clarification by the interviewees in the subsequent discussion section revealed deeper insights. Specifically, the discussion findings indicated that the key factors influencing the overarching benefits of GI in lost spaces are space typology, locality and site

context, accessibility, safety, and responsiveness to the surrounding community's needs.



**Figures 10 and 11:** Example of spaces underneath elevated highway categorized under Typology 1. Figure 10 is an example of residual spaces underneath DUKE (Typology 1) and Figure 11 shows a portion of residual space underneath AKLEH. These spaces are relatively easy to access and generally utilized for public usage such as informal parking and passageway thus is considered suitable for social benefits such as opportunities for recreation, tourism, social interaction as well as enhanced city attractiveness

*Source: Author*



**Figures 12 and 13:** Example of spaces underneath elevated highway categorised under Typology 2. Figure 12 and 13 is an example of residual spaces underneath MEX (Typology 2). These spaces are considered hard to access and generally restricted from any public usage due to its location and surrounding context and thus considered suitable for environmental benefits such as air quality improvement, improved soil quality and erosion prevention as well as biodiversity protection and enhancement

*Source: Author*

The results have shown that employing GI planning to address lost spaces underneath elevated highways brings myriad benefits, which nonetheless vary according to the typologies of the spaces. The findings of this study are in line with several preceding studies which identified an array of GI's environmental, social, health, and economic benefits with regard to spatial



planning and design in urban areas. Its benefits, such as more green spaces, can be considered an opportunity to increase biodiversity in the city and thereby promote a better quality of life (Van Zyl et al., 2021; Liu & Russo, 2021; Ramyar et al., 2021; Weththasinghe & Wijesundara, 2017). Apart from that, economic benefits in terms of higher land and property value, increased investment and spending, as well as environmental cost-saving are also the direct outcomes of spaces and cities with more GI elements (Choi et al., 2021; Hansen et al., 2019; Kim, 2016; Gore et al., 2013). Moreover, improved physical and mental health benefits following the recent global Covid-19 pandemic are linked with urban areas that have more GI elements (Pamukcu-Albers et al. 2021; Heckert & Bristowe 2021; Hanzl, 2021). In particular, scholars have highlighted the importance and advantage of a tactical approach in transforming urban spaces to create more green areas that benefit the general public. Therefore, based on the core principles and elements of GI which revolve around multifunctionality (Choi et al., 2021; Van Zyl et al., 2021; Hansen et al., 2019; Benedict & McMahon, 2012), it can be concluded that GI is a suitable planning and design approach to address residual spaces. This claim is made on the basis that GI planning can offset the issues generated by traditional monofunctional planning and provide a wide range of environmental, social, and economic benefits to the city.

The overall aim of this study was to identify the benefits of GI planning in addressing residual spaces underneath elevated highways. To this end, the revealed typologies prove to be a useful first step to cultivate a better appreciation and understanding of the potential benefits of addressing lost spaces through GI. This study also represents an early attempt to gain inclusive insights into the benefits of the GI planning approach as opposed to the conventional zoning planning method. As proven by the present empirical findings, GI has various advantages over traditional planning; this should entice landscape architects, planners, urban designers, and policy makers to undertake GI for the more holistic and informed planning of infrastructure and residual spaces, particularly underneath elevated highways, to mitigate the current lost space situation in urban areas. Through GI's multifunctional approach to spatial planning, lost spaces can be transformed or, to a certain extent, avoided. Ultimately, a comprehensive understanding of the potential benefits of lost space redesign and planning through GI is highly valuable to the city in general. By acknowledging the benefits provided by GI along with its suitability for redesign and development, this study has important implications in driving a more holistic spatial planning approach for the achievement of a sustainable compact city, in line with Kuala Lumpur's 2040 aspirations.

## CONCLUSION

In conclusion, despite the expanding discussion on the applications and benefits of GI, there is little knowledge on how its benefits can address residual and lost spaces, especially in Kuala Lumpur City. In response to this, the findings from this study have, to a certain extent, shed light on the advantages of GI planning in lost spaces, specifically based on the two typologies of residual spaces underneath elevated highways. In line with the objective of this study, it was discovered that the typologies of lost spaces (i.e., easily accessible and hard to access) present two extremes of benefits; Typology 1 leans towards social and economic benefits while Typology 2 leans towards environmental benefits. Against the highlighted GI benefits, it is evident that the current monofunctional planning approach of infrastructure requires new approaches and more sustainable design concepts — a gap which the GI planning approach can fill. Difficult spaces, particularly those under elevated highways, are a result of previous traditional planning. Notably, they constitute a large proportion of urban land and are of interest to many stakeholder groups. This study suggests that while lost spaces are often viewed as hazardous or unsightly, GI planning can turn them into an economic, social, and environmental resource that contributes to the compact city goal. With the rate of urbanization predicted to intensify in future years, mitigating the monofunctional effects of traditional spatial planning and managing dwindling urban spaces is a key factor in ensuring cities are compact and sustainable. Future studies are recommended to look deeper into specific GI benefits with regard to urban spatial planning and design (e.g., ecosystem services, quality of life) as well into GI's technical aspects (e.g., safety, regulations, and planning policy).

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## **THE LOCATIONAL MEASURE IN THE PLANNING OF QARIAH MOSQUES**

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### **Abstract**

Public facilities are vital to contributing positively to people's quality of life. Facilities play an important role in cities by providing public services to communities. Therefore, planning equitable public facilities is crucial for planners to ensure that every citizen has equal access to the planned public facilities. Scholars have conducted various studies to assess the location and distribution of public facilities. Spatial equity is one aspect of locational measures used by scholars to determine the accessibility and spatial distribution of facilities in relation to the user's location. Previous studies by researchers have focused on public facilities such as medical facilities, parks, and schools. However, there have been limited studies that evaluate the spatial equity of religious facilities such as mosques. Therefore, this study attempts to assess the location of qariah mosques (mosques of local jurisdiction) based on the spatial equity concept by measuring their spatial distribution and accessibility. The present study utilised a Geographical Information System (GIS) and used descriptive and statistical analyses to examine the spatial equity of 418 mosques in Selangor Darul Ehsan, Malaysia. GIS data was collected for this study, which includes mosques, populations, and mukim (township or sub-district) boundaries. The study used aggregated data from the population to identify the spatial pattern and spatial distribution of accessibility to mosques. The data was analysed using the container index and local indicators of spatial association (LISA) to assess the accessibility and spatial equity. This method utilised GIS capabilities to explore the spatial relationship between mosques and population characteristics. By adopting this approach, the findings of the study will reveal communities with limited accessibility to mosques.

**Keywords:** Spatial equity, imarah, mosque planning, GIS

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## **INTRODUCTION**

Public facilities are services provided by the local authorities to their people, and they are important amenities in the urban fabric that contribute positively to the quality of life. Public facilities are provided to the community to offer services such as in the fields of health, education, religion, safety, and recreation. It is therefore of paramount importance that these facilities are planned efficiently and effectively to ensure that they provide benefits to the people. In Peninsular Malaysia, public facilities are provided based on the Planning Standards for Public Facilities developed by PLANMalaysia. Planning of public facilities involves two main components: the public facilities and the user. As a result, any planned public facilities should take into account the existing supply and distribution of public facilities as well as user or community demand. This is to ensure that any spatial mismatch between the distribution of people and public facilities is minimised.

Overall, studies by researchers on the aspects of public facility location have focused on the realm of spatial equity in the distribution of public facilities (Talen & Anselin, 1998; Tomic et al., 2004; Chang & Liao, 2011; Dadashpoor et al., 2016). Spatial equity is used to assess whether people have equal access to public facilities. The question of fairness in the distribution of public facilities remains a matter of debate among researchers and planners. Researchers have conducted several studies in the past on the issue of spatial equity in medical facilities (Taket, 1989; Rosero-Bixby, 2004; Roeger et al., 2010), school facilities (Talen, 2001; Singleton et al., 2011), and recreational park facilities (Talen & Anselin, 1998; Nicholls, 2001; Chang & Liao, 2011).

However, there has been a limited amount of research that has investigated the spatial equity of mosques. A mosque is an important institution in Muslim society and has an important function in the Muslim community as a place for religious activities, educational activities, shelter, and community centre (H. Alami, 2012; S. Omer, 2010; H. Mahamid, 2009; H. Mortada, 2003; T. Rasdi, 1998). It is critical that the spatial distribution of mosques be planned effectively to ensure that people have equal access to the mosques. Despite the fact that it is well-known that a mosque is an important public facility in a mostly Muslim nation, research on the spatial distribution of mosques is limited.

Therefore, the objective of this study is to evaluate the spatial pattern and spatial distribution of mosque accessibility. The state of Selangor was chosen as the case study because it has a population of 6.5 million people, of which 59% are Muslims. The state holds 418 mosques spread throughout nine districts, making it an ideal case study for evaluating the spatial equity and accessibility of mosques.

There are several approaches to exploring the spatial relationship between mosques and population characteristics. This study analyses data using a Geographical Information System (GIS) and local indicators of spatial

association (LISA) to measure the spatial equity and accessibility of mosques. This study only focuses on identifying the spatial relationship between mosques and the population characteristics by using total population data by ethnic group and excluding socio-economic data from the analysis. By adopting this approach, the findings of the study will uncover the communities with inadequate access to mosques. The results will shed light on the spatial equity of mosques, aiding planners and policymakers in their decision making.

## **LITERATURE REVIEW**

The issue of equity disparities in the distribution of public facilities has been a topic of interest to scholars. Equity in public facility planning can be described as each citizen having equal access or proximity to the public facilities. Early studies by scholars in the context of equity have focused on determining the definition of equity and the factors causing inequality in the distribution of public facilities.

Many scholars have conducted studies with regard to the spatial equity of public facilities (Talen & Anselin, 1998; Tomic et al., 2004; Chang & Liao, 2011; Dadashpoor et al., 2016). Most of the studies focus on public facilities such as schools, recreational parks, and medical facilities. However, there are limited studies focusing on the spatial equity of mosques. A mosque is an important institution in the Muslim community, serving as a place for religious activities, education, shelter, and community centre (H. Alami, 2012; S. Omer, 2010; H. Mahamid, 2009; H. Mortada, 2003; T. Rasdi, 1998).

In Selangor, the planning of mosques is based on the Planning Guidelines for the Provision of Mosques and *Suraus* (smaller premises for prayers). The planning guidelines for mosques have classified the hierarchy of mosques into 3 categories: State Mosque, District Mosque, and Local Mosque (Jabatan Perancangan Bandar dan Desa Negeri Selangor, 2010). Although there are existing planning standards on mosque planning, it is also important to understand the planning of mosques from the Islamic perspective.

The planning of mosques from an Islamic perspective is derived mainly from two main sources: the Quran and Hadith. Although there are 1006 occurrences of a mosque being mentioned in the Quran, none of the Quranic verses mention anything about the criteria of mosque planning standards. It is also worth highlighting that there is no direct mention of mosque planning standards and locational aspects in the hadith. However, certain requirements of a mosque can be implied indirectly from the hadith. Based on the hadith, it can be interpreted that mosques in the early period of Islam were located within walking distance of populated areas and commercial areas. Ibn Umm Maktum also clearly stated the obligation to perform prayers at the mosque (Hadith 792). Therefore, it is suggested that current planning approaches should take into consideration the locational aspects when siting a mosque. This is due to the fact



that Muslims, especially males, are obligated to perform congregational prayers in mosques.

This study focuses on assessing the spatial equity of *qariah* mosques in Selangor. According to the Planning Guidelines for the Provision of Mosques and *Suraus*, *qariah* mosques (mosques of local jurisdiction) should be provided for every 20,000 people. Therefore, this standard was used in the analysis to evaluate the ratio of each mosque per population for each *mukim* (township or sub-district) level. Several methodologies have been suggested by scholars through empirical studies to assess the extent of equitability in the distribution of public facilities. One of the approaches is to measure the accessibility of public facilities to their point of origin, such as a neighbourhood unit or geographic boundary (Talen and Anselin, 1998). The other approach is to use the Local Indicators of Spatial Association (LISA) to visualise and illustrate the spatial pattern of the phenomenon (Anselin, 1995). Both of these approaches have their advantages and can be combined to assess the spatial pattern and accessibility of local mosques. The LISA method proposed by Anselin (1995) has “a useful purpose in an exploratory analysis of spatial data, potentially indicating local spatial clusters and detecting outliers.” Therefore, LISA is suitable to be applied to assess the spatial pattern of the local mosques.

In the context of accessibility, there are several methods of measuring accessibility and quantifying access that can be adopted. One of the most frequently cited methods of measuring accessibility is by Talen and Anselin (1998). The method by Talen and Anselin (1998) has been adopted in many studies, such as Mobley, L. R., et al. (2006); Xiao, Y., Wang, Z., Li, Z., & Tang, Z. (2017); and Anselin, L., & Li, X. (2019). It shows that the method for measuring accessibility is still widely accepted by scholars. Accessibility can be assessed using the following approaches:

- i. Container Index
- ii. Minimum Distance
- iii. Travel Cost
- iv. Gravity

**Table 1:** Variations in the measurement of accessibility

Approach	Definition	Suitability	Example
<b>Container Index</b>	The number of facilities in each given unit, such as neighbourhoods, <i>mukims</i> , counties, and districts	Suitable for access measures within a geographical boundary	The number of local mosques within the <i>mukim</i> boundary

<b>Minimum Distance</b>	The distance between a point of origin, such as a neighbourhood centroid block, and the nearest facility	Suitable for access measures to the closest available facility	The distance between a neighbourhood centroid point and the nearest local mosque
<b>Travel Index</b>	The total or average distance between a point of origin, such as neighbourhood centroid blocks, and all facilities	Suitable for access measures to all facilities available to the user	The average distance between all local mosques and the neighbourhood centroid points
<b>Gravity Index</b>	An index in which the sum of all facilities is divided by distance	Suitable for access measures that consider the effect of distance as a deterrent	All local mosques are weighted by their size and divided by distance

Adapted from Talen (1998)

The various approaches mentioned in Table 1 can produce varying results depending on how the researcher defines accessibility. Therefore, “the choice of access measures has to be considered very carefully when trying to analyse the spatial equity of a given resource distribution” (Talen & Anselin, 1998). Several other studies have also adopted the minimum distance approach to assess spatial equity (Talen & Anselin, 1998; Rosero-Bixby, L., 2004; Smoyer-Tomic, K. E., et al., 2004; Comer, J. C., & Skraastad-Jurney, P. D., 2008; Yin, H., & Xu, J., 2009; Zhang, X., Lu, H., & Holt, J. B., 2011; Pan, J., et al., 2016). In the context of *qariah* mosque planning, most people tend to travel to the closest mosque available to them. Therefore, of the four approaches to measuring the accessibility index, the container index and minimum distance are better suited for adoption.

## RESEARCH METHOD

### Research Design

This research adopted an empirical study approach. The present study utilised a Geographical Information System (GIS) and used descriptive and statistical analyses to assess the spatial equity of 418 *qariah* mosques in Selangor Darul Ehsan, Malaysia. Selangor was chosen as a case study to evaluate the spatial equity and accessibility of mosques in the state. From the three different types of mosques in Selangor, the sample consists solely of local mosques. The present study attempted to assess the spatial equity of local mosques by measuring their spatial distribution and accessibility. An evaluation was carried out by applying

GIS-based methods to the container index as described by Talen and Anselin (1998). Besides the container index, this study also applied LISA to assess the spatial pattern of local mosques in the study area. Both of these approaches have been selected as the most suitable methods to assess accessibility. They measure the distance between the nearest available local mosques and the population, as well as the spatial pattern of local mosques.

This study used aggregated data on population and human settlement to identify the spatial pattern and distribution of mosque accessibility in each *mukim*. Despite only using aggregated data, it is still considered sufficient to reveal the general pattern of spatial distribution in the study area. The results based on this data would provide meaningful insights on the spatial equity of *qariah* mosques in Selangor. The socio-economic data has been omitted from the analysis because it is not available at the *mukim* level. The data was analysed in GIS using the container index and Local Indicators of Spatial Association (LISA) to assess accessibility and spatial equity. By taking this approach, the study's findings will shed light on communities with limited access to *qariah* mosques as well as spatial equity at the *mukim* level.

### **Case Study**

Selangor was chosen as the case study because the state has the largest population in Malaysia, with a total population of 6.5 million people, and 59% of the population are Muslims. It is the ninth largest state in Malaysia, with a total area of 8,104 km<sup>2</sup>. Selangor is located geographically in the central western part of Peninsular Malaysia, neighbouring Kuala Lumpur. Most of the urban areas in Selangor are located in close proximity to Kuala Lumpur, while the rural areas of the state are located mostly in its northern and southern parts.

The state has a total of 418 *qariah* mosques distributed across 9 districts, which makes it a suitable case study to assess the spatial equity and accessibility of local mosques. This study was carried out at the *mukim* level in Selangor, consisting of 54 *mukims*. Data at the *mukim* level revealed the spatial pattern and distribution of local mosques in Selangor. Figure 1 is a map of the study area with all the districts in Selangor.



Figure 1: The location of the study area, the state of Selangor

### Data Collection

The study used aggregated data from the population to identify the spatial pattern and spatial distribution of accessibility to local mosques. The spatial pattern was analysed using GIS capabilities. Therefore, to ensure that the analysis could be performed, GIS data was required, which included mosques, populations, and *mukim* boundaries.

### Mosques Data

Jabatan Agama Islam Selangor provided the data for *qariah* mosques, which includes a list of 418 *qariah* mosques in Selangor. Due to the lack of GIS-formatted data, a GIS land use map from PLANMalaysia was used to derive the spatial data for *qariah* mosques. Upon inspection of the land use map, the GIS database revealed 448 *qariah* mosques. As a result, data cleansing was performed to validate the GIS database. Using secondary data from high-resolution satellite imaging and Google Street View, the database's accuracy was verified by visually inspecting the data. Only 386 *qariah* mosques were deemed suitable for analysis following the completion of data cleansing procedures. Due to inaccuracies and spatial geometry errors, the remaining data was omitted. The data attributes of the local mosques obtained from Jabatan Agama Islam were entered into the GIS database after the spatial data had been validated.

### **Population Data**

The population data at the *mukim* level was obtained from the Department of Statistics Malaysia. Due to the fact that socioeconomic details are only available at the district level, they were not included in the data collection because they are limited to the total population. Since the study is done at the *mukim* level, only information about the total population is available.

When the study was conducted, the population statistics had the same difficulty. The publicly accessible information is presented as a report. Therefore, it was necessary to convert the report to GIS format. Several procedures had to be followed to guarantee the accuracy of the transformed GIS data. The initial phase was to establish a *mukim* boundary in GIS format. The boundary data was received in the form of polygons from the Department of Survey and Mapping Malaysia. After obtaining the polygon data, a validation procedure was performed to check that the population data matched the *mukim* boundary. The GIS data would remove any discrepancies between the *mukim* information in the population data and the *mukim* data. Following the completion of the validation procedure, the validated *mukim* information from the population data would be added to the *mukim* GIS data. The data attributes provided in the GIS data include the total population and the total Muslim population.

### **Data Analysis**

This study assessed the spatial pattern and accessibility of local mosques using GIS software. The data underwent GIS analysis, namely the container index and Local Indicators of Spatial Association (LISA). Secondary data from the Jabatan Agama Islam Selangor, PLANMalaysia, the Department of Statistics Malaysia, and the Department of Survey and Mapping Malaysia were used for the analysis.

The container index was used to analyse spatial accessibility. Based on *mukim* boundaries, this analysis was able to identify the total mosques, the total population of Muslims, and the population density per acre. Besides the container index, the study also applied Local Indicators of Spatial Association (LISA) to detect patterns of local spatial clusters and outliers.

## **RESULTS**

### **Spatial Accessibility Using Container Index**

The distribution of mosques was analysed at the *mukim* level. Table 2 shows the total mosque per *mukim* boundary. Based on the container index results, it can be concluded that the largest number of local mosques per *mukim* is 56. To identify the reasons behind the large number of mosques in certain *mukim*, it is important to assess other variables, such as the total population of Muslims and the population density, against the total number of local mosques.

Figure 2 illustrates the findings from the container index based on the total number of local mosques in each *mukim*. Meanwhile, Figure 3 and Figure 4

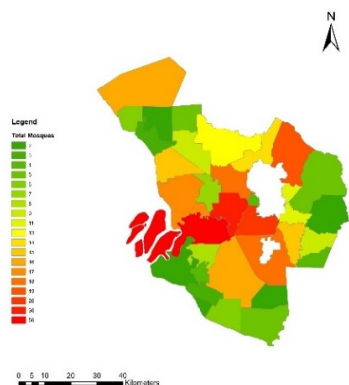
show the results for both the total population of Muslims and the population density per acre by *mukim* boundary.

**Table 2:** Total *qariah* mosques per *mukim* boundary

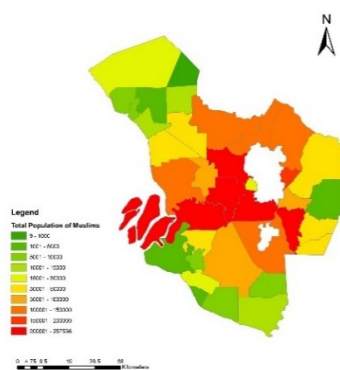
Total Local Mosques	Mukim Boundaries	Total Local Mosques	Mukim Boundaries
0	1	13	1
2	5	14	1
3	3	15	2
4	3	16	2
5	3	17	1
6	2	18	2
7	1	19	1
8	1	26	1
9	2	30	1
11	2	56	1

The results depicted in Figures 2 and 3 clearly demonstrated an essentially identical result between Figures 2 and 3. It can be determined that the total number of mosques is directly proportional to the overall population. This is further demonstrated by the outcome depicted in Figure 6.

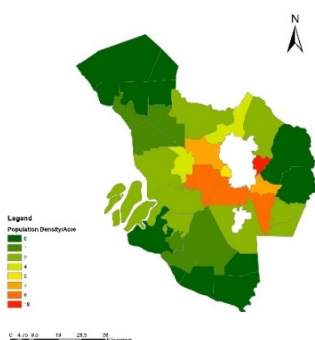
Figure 4 and 5 demonstrates the reverse of Figures 2 and 3, as the largest and smallest values in Figures 2 and 3 do not correspond to those of Figure 4 and 5. This data demonstrates that the population density per acre and the total number of local mosques for each *mukim* do not match. It illustrated that the total number of mosques per acre is directly influenced by the population density per acre. Therefore, it is possible that the population density per acre will impact the number of total mosques allocated for the *mukim*.



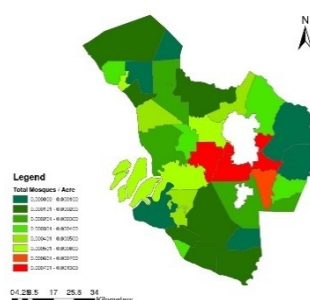
**Figure 2:** Total local mosques by mukim boundary



**Figure 3:** Total population of Muslims by mukim boundary

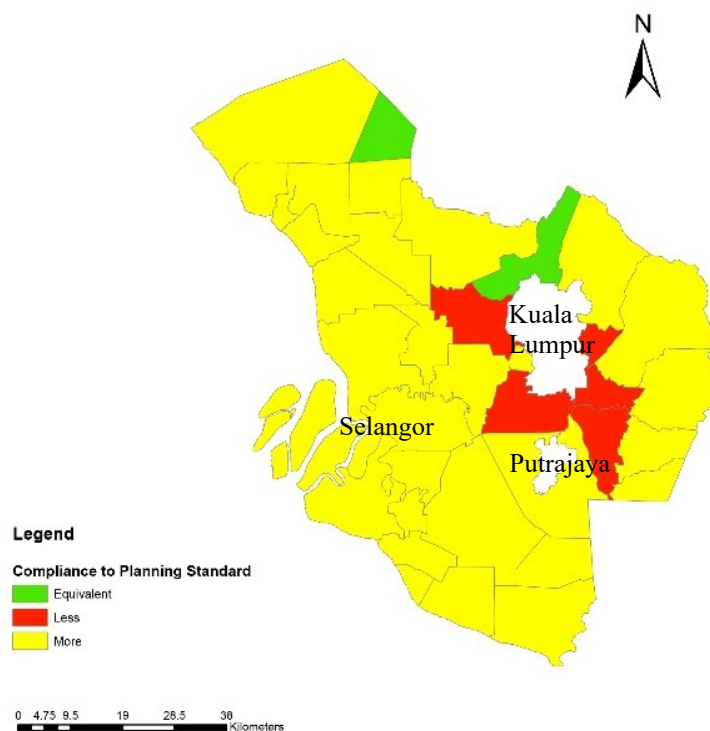


**Figure 4:** Population Density/Acre by mukim boundary



**Figure 5:** Total Mosque Density/Acre by mukim boundary

Figure 6 provides a visual representation of compliance with the planning standard for determining whether each *mukim* is assigned a sufficient number of local mosques in accordance with the standard. Except for the red zones, the majority of *mukim* are distributed with an adequate number of local mosques, as seen in Figure 6. The red zones in Figure 6 (i.e., Petaling, Sungai Buloh, Cheras, Ampang, and Kajang) represent *mukims* with large populations and high population densities. They are urban areas adjacent to Malaysia’s capital city of Kuala Lumpur.



**Figure 6:** Compliance to the Planning Guidelines for the Provision of Mosques and *Suraus* in Selangor.

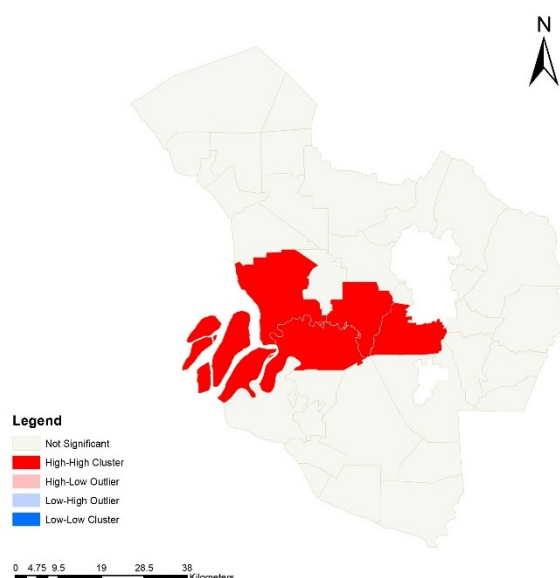
The *mukims* with yellow hues are clustered in the red zone's periphery. The majority of these zones have a lower population density than the red zones. According to the data, major population areas receive fewer mosques than required by planning regulations. Therefore, it can be inferred that these densely populated areas receive fewer facilities than those required by planning standards.

#### **Spatial Pattern Based on Local Association**

In this study, Local Indicators of Spatial Association (LISA) were utilised to detect spatial clusters and outliers within the data in order to evaluate spatial patterns. This method computes the statistics for I-value, z-score, p-value, and cluster type, which may be high-high, low-high, high-low, or low-high. The z-score and p-value determined by this statistical analysis indicate the statistical importance of each value. The I-value is used to identify characteristics or boundaries whose values are similar or distinct. A positive I-value suggests that it has neighbouring values that are similar, whereas a negative I-value indicates that it has neighbouring values that are dissimilar. Additionally, a negative I-value indicates an outlier in the data. Consequently, the LISA statistics were



employed to determine whether there were any significantly high or low values in the research area. Figure 7 depicts the *mukim* boundaries using statistically significant LISA data.



**Figure 7:** LISA map based on container index

According to the LISA statistics, four *mukim* boundaries (Kelang, Damansara, Petaling, and Kapar) share a comparable I-value. This region contained a large proportion of the *mukim*'s mosques, indicating its high value. The p-value for the four *mukims* is less than 0.05, indicating that it is statistically significant with a 95% level of confidence. The remaining *mukims* are statistically insignificant because the p-value is greater than 0.05. Therefore, it can be concluded that four *mukims* in this study have comparable total mosque counts.

## DISCUSSION

The aim of this study is to identify the spatial distribution of accessibility and the spatial pattern of *qariah* mosques. This section will discuss the findings that were obtained from the analysis. The discussion is divided into two categories: the spatial distribution of spatial accessibility and the spatial pattern of spatial accessibility.

### Spatial Distribution of Spatial Accessibility

As shown in Figures 2 and 3, the distribution of local mosques is highly dependent on the total number of Muslims at the *mukim* level. Incorporating

population density data into the analysis revealed that the majority of high-density areas are allocated with higher mosques per acre than low-density areas. Although some of the higher-density areas have fewer *qariah* mosques, they are still considered to have a higher mosque density than lower-density areas, based on the ratio of mosques per 20,000 people.

Figure 5 reveals that Sungai Buluh, Petaling, Kajang, Cheras, and Ampang are the *mukims* with the fewest local mosques per 20,000 inhabitants. In order to achieve spatial equity in the allocation of *qariah* mosques, policymakers must address areas with fewer mosques per 20,000 inhabitants. It might be better to plan for an even distribution of *qariah* mosques across *mukims* to reduce spatial inequality in areas that have been affected.

This region can be the subject of additional research into the most effective strategies for reducing spatial inequality. This can be explored further by employing a more nuanced method for measuring the accessibility of *qariah* mosques in different neighbourhoods at a local scale.

### **Spatial Pattern of Spatial Accessibility**

LISA provides the capacity to interpret spatial clusters or spatial outliers in the context of their local environment. Based on the findings of this LISA-based study, high concentrations of mosques have been identified from the central portion of Selangor to the western coast of Selangor. This cluster of *mukim* represents the *mukim* with the most *qariah* mosques.

This *mukim* cluster consists of Kelang, Damansara, Petaling, and Kapar. In close proximity to Kuala Lumpur and classified as urban areas in Selangor, the following locations are classified as urban. The areas are also densely populated, with populations ranging from 262,998 to 603,430. Therefore, these regions have a greater number of mosques than other regions.

Although some of these areas have the highest concentration of *qariah* mosques, certain *mukims*, such as Petaling, have a lower allocation of *qariah* mosques than the planning standard mandates. Therefore, the method of allocating the number of *qariah* mosques in each mosque based on population requirements revealed some irregularities, which necessitate additional evaluation to address them. It is suggested that to look into this problem, a more thorough and detailed study be carried out.

### **CONCLUSION**

This study demonstrated that the container index and local indicators of spatial association (LISA) can shed light on the spatial equity of public facilities. Using LISA and GIS to evaluate spatial equity has enabled planners to identify the spatial pattern and clusters of *qariah* mosques, particularly the distribution of *qariah* mosques in each *mukim*. Despite the fact that this study is limited to *qariah* mosques, it has demonstrated that it can provide insight into the spatial pattern

and spatial distribution of local mosques. The difference between evaluating *qariah* mosques and other public facilities lies in the planning approach for the latter. The *qariah* mosques in Malaysia are designed to meet the needs of the Muslim population. Therefore, some adjustments must be made to the data before the container index and LISA analysis can be performed. This research modified the methodology by analysing only Muslim populations. Based on the results, planners and policymakers may be able to identify areas with insufficient *qariah* mosques.

Although urban areas have the highest concentration of mosques per 20,000 inhabitants in Selangor, suburban areas such as Tanjung Karang in northern Selangor have more mosques per 20,000 inhabitants than urban areas adjacent to Kuala Lumpur. Consequently, the focus should be on these urban areas, which typically have larger populations than their suburban counterparts.

This study also demonstrated that this methodology, which employs GIS technology and GIS data, can be applied to the analysis of other public facilities, including schools, hospitals, and recreational parks. This methodology yielded insights that may have been difficult to interpret from tabular data. Therefore, it is suggested that this methodology be used to analyse the distribution of public facilities in local and structural plans. It can assist planners to make more informed decisions regarding the provision of public facilities.

This research has some limitations. This study used only aggregated data for fundamental populations. This is due to the lack of availability of GIS population data at the *mukim* level. Consequently, future research can concentrate on the methodology for acquiring precise geocoded population data with comprehensive socio-economic data. Detailed GIS population data is expected to provide additional insight into the various socio-economic groups that benefit from *qariah* mosques and other public facilities.

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## **HOW DOES THE INDOOR ENVIRONMENT AFFECT MENTAL HEALTH WHEN WORKING REMOTELY?**

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### **Abstract**

The Movement Control Order (MCO) has forced significant segments of Malaysia's economy to shut down or scale back operations in a nationwide effort to curb the spread of COVID-19. However, one segment of the population that is perhaps more susceptible to the adverse economic effects of the pandemic is the mental well-being of those who need to work remotely at home. This study expands on previous research by examining workers' perceptions of remote working practices at home and their impact on a person's mental condition. The reviewed literature presents four (4) main indoor environmental quality factors: spatial and thermal comfort; noise distraction and privacy; visual comfort; and overall satisfaction with their home and its relation to the work stress level, in addition to the emergence of the new norm of working during the pandemic. This study has shown that the quality of the indoor environment plays an important role in ensuring comfort when working from home, as the practice could have a negative or positive impact depending on the IEQ. From the results, most of the IEQ score values were more than 1, and the mean was the highest, which demonstrates a positive scale. The input from respondents on IEQ also indicates their mental well-being due to the fact that IEQ strongly affects workers' stress and productivity levels when working from home. This paper recommends extending the study on gender and productivity level, as well as mental well-being (Factor 3), when working from home, and how this relationship may affect an organisation when such a policy is implemented.

**Keywords:** Indoor Environment, Mental Health, Remote Working, Pandemic

## **INTRODUCTION**

No one expected or wanted remote work to scale because of the Covid-19 pandemic. The battle for remote work has been ongoing. Surprisingly, remote work eliminates the wasted time of commuting, the petty tyranny of office politics, and the death of the workday by a ton of meetings. It's hard to argue any other outcome. Once companies and organizations have the processes and tools in place, and the results of weeks or even months, of remote working, it will be difficult to put the genie back in the bottle. The rapid, rushed transition to working at home for the entire workforce in the face of a global pandemic is not the best ideal way to scale remote work for everyone, and home isn't the location of choice for many. Many employees across the country are well beyond the first week of working from home started when Movement Control Order (MCO) was imposed in the country to control the spread of Covid-19, and that is when the problems start to surface. The second week of the MCO is when a lot of the problems start setting in, ranging from aches and pains and putting on weight. In week three and the following weeks, workers start to create new structures to help build physical immunity and mental resilience. It is more important than normal time to sleep, avoid sugar, move and avoid negative thoughts. Stress, depression, or social exhaustion is unavoidable in the best of times especially so now – the alarming science of stress. Luana Marques (2020), a Harvard psychologist said that from a scientific perspective when there is a real threat and the Covid-19 qualifies, the body goes into flight mode. There is a fear response that happens naturally – quite quickly, immediately, the limbic system goes on, and the emotional part of the brain, and it gets people ready for a fight, flight, or freeze (Marques et al., 2020). The poor consequences are that thinking in the brain decreases. They started to lose focus as they are trying to be productive and really, they don't have as much brain capacity as they had before. In the current situation, the stress becomes chronic. Depression can lead someone to go through changes in their appetites and sleeping habits, feeling fatigued usual shifts in mood and energy, and slow in thinking or movement (Compton and Shim, 2015; Marques et al., 2020). According to World Health Organization (WHO) in the World Health Report 2020, 41% of employees whom WFH vs on-site considered themselves highly stressed, compared to 25% of those who worked only on-site. Employees whom WFH experienced more of a blur when it comes to work and personal life boundaries, especially with the use of apps and smart devices. For some, the transition has been smoother than others, especially if employees are well-versed in work-from-home basis and the technology needed for it was made available before the MCO (Irawanto et al., 2021).

The understanding of health effects related to the indoor environment has evolved over the past decade (Srinivasan et al., 2003; Arif et al., 2016; Patino and Siegel, 2018; Abdulaali, 2020). Much of the previous research has focused on indoor air constituents, primarily pertaining to particles, bioaerosols, and

chemicals (Mujan et al., 2019; Abdulaali et al., 2020), and comfort factors such as temperature, air ventilation, and humidity (Arif et al., 2016). More recently, many researchers have begun to discuss the association between the built environment and humans as a complex interplay between building occupants or residents and an array of physical, chemical, biological, and design factors. Design characteristics of the indoor environment such as lighting, heating, ergonomics, and noise may create additional exposures that might contribute to health, comfort, and productivity. As people spend more time indoors, especially when they work remotely, the likelihood of significant detrimental health effects increases, such as declining mental health (e.g., depression, anxiety, schizophrenia, bipolar mood disorder, eating disorder, etc.). Mental illness is an emerging issue in Malaysia and is among the 10 global causes of morbidity and mortality. In 2020, mental illness was expected to be the second biggest health problem affecting Malaysians after heart disease (Ministry of Health Malaysia, 2017). According to the Institute for Public Health, under the Ministry of Health Malaysia (2017), one in every three Malaysian adults aged 16 and up has a mental health problem. The survey critically analysed what is known about the indoor environment and mental health conditions (e.g., stress levels, depression, and anxiety). The prevalence of depression was the highest in Selangor at 22.6% among urban school students (10.3%). The results also reported that males had a higher prevalence of depression, while females had a higher prevalence of both anxiety and stress. The main factors that contribute to mental health issues include loneliness, diets, occupational workloads, relationships (family, friends, partner, or spouse), tobacco use, alcohol consumption, drug abuse, sexual activity, and being bullied. Further studies have examined that major depressive disorder or depression is closely related to a feeling of sadness, worthlessness, or guilt, which can affect someone to lose interest in their routine activities (Srinivasan et al., 2003). Population density, the increasing cost of living in an urban area, and the built environment also contribute to the risk factor for mental health disorders (Marzukhi et al., 2020; Zainal and Hosni, 2022).

Recent studies consistently show an association between the indoor living environment and the well-being of adults (Arif et al., 2016; Patino and Siegel, 2018; Marzukhi et al., 2020; Zainal and Hosni, 2022). People often spend more than 80% of their lives indoors, yet they know much more about ambient environmental conditions and health than they do about the built environment and mental health well-being (Zainal and Hosni, 2022). Definitely, the built environment affects mental health, including stress levels, depression, and anxiety in two (2) major ways: (i) quality characteristics of the indoor environment; and (ii) environmental characteristics such as housing, crowding, noise, indoor air quality, and light. Most research on housing and health has focused on physical health rather than mental health and well-being (Marzukhi et al., 2020). Nonetheless, this study aims to focus on indoor environmental quality



and its association with work-from-home practice. Many countries around the world have adopted the work-from-home concept due to COVID-19. Indoor environmental quality, which emphasises house type and density (e.g., high-rise unit or landed house), floor level, spatial plan, and housing quality, has been linked to mental health despite insufficient research having been done on the subject. Indoor environmental quality is also associated with how workers are forced to work from home and how this has affected their mental well-being.

Although much research focuses on academia (e.g., teachers), self-efficacy, burnout, or emotional exhaustion, this study found no systematic review evidence of research on the characteristics of the indoor environment affecting psychological and emotional well-being when working remotely. To address this gap, the present study explores the literature and expands on professional workers' opinions on remote working practices at home and how they impact a person's mental health conditions. The reviewed literature presents mental health in the context of indoor environmental quality and identifies those factors in the design and planning guidelines for improving mental health, especially among urban inhabitants. The research question also demonstrates any challenges regarding the mental health well-being of workers who work from home or remotely during the COVID-19 lockdown.

## **LITERATURE REVIEW**

### **Conceptualization of well-being at work from home in the current review**

Over the past decade, the understanding and attention to health effects related to the indoor environment have evolved. Indoor Environmental Quality (IEQ) is one of the categories to recognize the standards of building design and environmental assessment. The factors being evaluated by IEQ are categorized as spatial comfort, indoor air quality, and thermal comfort, noise, and privacy, visual comfort. Some scholars have focused on indoor air constituents (particles, bio aerosols, and chemicals), and comfort factors (temperature, airflow, and humidity). Rapoport (1990) emphasizes the need to look at the relationship between the built environment and humans as a complex interplay between building occupants (who they are and what they do) and an array of physical, chemical, biological, and design factors.

In this section, the paper attempts to review the association between indoor environment and work related-well-being, which has gained increased attention. People spend up to 80% of their time indoors whether it be a residential, office, or commercial buildings, 11% in their vehicles, and another 9% in open spaces (including the park, and streets) (Srinivasan et al., 2003; Zainal and Hosni, 2022). A spatial organization such as lighting, heating, ergonomics, and noise may create exposures that contribute to comfort and health, or to chronic health effects (Compton and Shim, 2015). For example, there is evidence indicating that suppression of melatonin by nocturnal artificial lighting may play a role in breast

and colon cancer (Srinivasan et al., 2003). Researchers in environmental psychology have developed much literature on ways of measuring how the physical environment meets people's needs. One of the items in environmental psychology is lighting which can be categorized as artificial, interior lighting, and natural light or daylighting from windows (Marmot and Ucci, 2015). Daylighting research has linked increased comfort and productivity (Arif et al., 2016; Mujan et al., 2019). In addition, aspects of psychological comfort such as territoriality and privacy are strongly affected by spatial layout: office/room size and location; partitioning influences acoustic as well as visual privacy (Rapoport, 1969).

People not only live inside the house but due to several crises, workers are encouraged to remote work at home. Remote work or work from home is a working pattern that encourages professionals to work beyond the conventional office setting (Anka et al., 2020). In another way, by commuting to the workplace every day and working from a fixed desk, the remote workforce can carry out their activities and tasks, and achieve their goals anywhere they opt. The benefit of remote work is that an employee can choose to work in a way that makes work-life balance perfect (Irawanto et al., 2021). A remote worker is someone who is hired by a company but operates beyond the conventional office environment—working from a nearby co-working room or from home (Anka et al., 2020; Galanti et al., 2021). Some research showed when workers were able to work remotely, they are more satisfied with their jobs, more committed to their organization, and experience less stress linked to the day-to-day demands of the office and commute (Galanti et al., 2021). However, a worker's job always requires some level of interaction with their colleagues which may be challenged by physical, communication, and temporal separation. Individuals claimed that they missed office/workplace interactions, and felt isolated as they could not share concerns they had with colleagues. This may lead to limited access to the social and emotional support that is crucial in increasing employee engagement, and well-being. In order to maintain contact and meet their job expectations, workers heavily rely on ICTs which allow them to stay connected when working from different locations. As a result, they reported working long hours, and become harder to switch off from work. This is a phenomenon that intensifies in an “always-on culture”, when individuals are expected by their supervisors to be constantly available, feeling obliged to follow strong norms set by their colleagues who are also connected. These behaviors can impair individuals' ability to switch off from work, translating into poor well-being and health problems (Vischer, 2007).

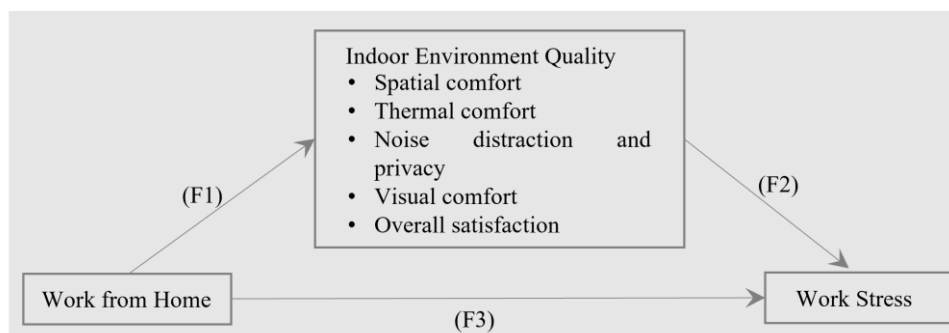
Work stress is a condition that affects emotions, thought processes, and the thinking process (Irawanto et al., 2021). Work stress is a recently recognized problem since the new norm of work-from-home practice due to several factors such as pandemics, office rents, infrastructure and maintenance costs, logistics and transportation costs, and flexibility. According to Vischer (2007), work stress

poses a significant effect on the health of an employee's performance adversely at the individual level. It will lead to absenteeism, less motivation, less job satisfaction, a low instinct to perform, low productivity, fatigue, no inquisitiveness to learn new things and develop new ideas, and less interest in work, thus, affecting workers' performance. Potential stressors (such as elements that interfere with task performance, motivation, and social relationships) include spatial organization, ambient conditions, and view or visual access from the workspace. Environmental stressors can influence the physiological process, produce negative affect, limit motivation and performance, and impede social interaction. Spatial organization issues include the openness of the layout. The proportion of open workstations to private, enclosed offices, and the distance between open workstations and access to needed resources such as technology and equipment, and washrooms. Closely related to spatial organization are ambient conditions such as sound, visual openness and light, ventilation, and thermal comfort (Vischer, 2007). Colors, artwork, signage, and design details convey meaning and can have symbolism that affects people emotionally (Kwallek et al., 2005). As an example, some work environments encourage personalization and individual decoration; some have key landmark elements that facilitate territorial definition for individuals or groups, such as windows (positive vibe) or washrooms (negative vibe). Environmental psychology research into the work environment also focused on measuring user satisfaction – both job satisfaction and environmental satisfaction. Based on stimulus-response logic, this approach posits worker satisfaction as a measurable behavioral response to features of the physical environment and the everyday surrounding.

In many respects, the main factors that may contribute to work stress are the condition of the living environment (Patino and Siegel, 2018). What is the role of indoor environment quality and environmental psychology, in encouraging or discouraging mental health conditions? Mental health can be defined as the state of well-being of an individual realizing their potential, being able to cope with the normal stresses of life, can work productively, and can contribute to the community (World Health Organization, 2022). World Health Organization (2022) suggest the definition of mental health as a dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with the good moral values of society. To emphasize, Srinivasan et al., (2003) mentioned that mental health is a standard level of cognitive-emotional functioning and adaption and a sense of coherence experience in managing stressors. According to Patino and Siegel (2018), the direct source of stressors is through the built environment and indirectly through good quality of living and working environment. Marzukhi et al., (2020) define the sphere of direct planning influence towards human settlements by the built environment including the physical space such as the buildings, streets, houses, schools, and networks.

Furthermore, Compton and Shim (2015) highlighted five major factors that affect poor mental health which are noise, perceptions of crime or feeling of safe, house overcrowding, cleanliness, access to green spaces, and community facilities. However, several studies also relate the mental health condition of the employee affected by the working conditions. The work conditions can be categorized into job demands and job resources, which affect employees' well-being and performance (Galanti et al., 2021). Job demands refer to the physical, psychological, and socio-organizational aspects of the work whose energy-depleting process induces people to experience energy loss and fatigue, leading to stress and burnout. While job resources refer to the physical, psychological, social, or organizational aspects of the job that reduce job demands and stimulate work motivation, personal growth, and development which are linked to resilience and an individual's ability to control and impact their environment successfully this lessening stress.

While a considerable body of research has been consolidated focusing on the macro context of the built environment, little research on detailed studies of the spatial organization using the indoor environmental quality (IEQ) and environmental psychology and the impacts on health and well-being performance and productivity. Besides, little in the approach of environmental psychology controls the personal and experiential influences and prejudices that affect workers' assessment of the quality of the workspace. To achieve the research aim, this research developed a conceptual model to demonstrate the factors that contribute to the mental well-being of the employee when working remotely to bridge the gap in the literature as well.



**Figure 2.** The conceptual model of relationship factors in this research

Factor 1 (F1) – Work from home is positively related to indoor environment quality

Factor 2 (F2) – Indoor environment quality is positively related to work stress

Factor 3 (F3) – Work from home is positively related to work stress due to the other factors

From the literature reviewed above, and the conceptual model in Figure 1, the environmental aspects have a massive impact on the workers' health well-being and psychological especially during the pandemic when they have to work remotely from any location for the first time without any preparation. This scenario contributes to the relationship of F1 as shown in Figure 1; between the work-from-home and IEQ. More recent research on environmental comfort elaborates on the notion of the suit between worker and workspace mainly in a multifunctional space, providing a sounder theoretical basis for workspace stress research. On the other note, the need to examine how work-from-home as a new way of working, has affected the mental well-being and productivity of employees with no prior remote work experience and to identify specific home-office spaces affecting remote work. In that so, the relationship of F2 was established to test whether the IEQ factors may affect the work stress level when remotely working as mental health has a relevant burden on the health of populations. While the association of work-from-home and work stress (F3) attempts to test the hypothesis that work-from-home alone affects work stress. The job demands and resources that are expected can be a major contributor to work stress.

## **METHODS**

To test the relationship between indoor environmental quality and work stress when the working from home period due to the Covid-19 lockdown. The Malaysia Government imposed the first MCO lasted until 3 May 2020 to curb the spread of the virus. MCO measures encompassed restrictions on movement and international travel and mandated the closure of business, educational institutions, and industry and sports activity.

The data was collected using the online questionnaire survey (using Google Form) and randomly distributed to the participants who were work-from-home full-time in public and private organizations. Participants are from various professions (professionals, technicians, and associate professionals, managers, service and sales, clerical support workers, crafted and trade workers, plant and machine operators, and assemblers). The questionnaire was distributed through social media such as Facebook to reach as many respondents to participate. At the time of data collection, all participants were work-from-home full-time. The duration of the study to be responded to is within a month, from 13 April until 31 May 2020, as many of them continue to work from home when the first MCO has been extended and relaxed to Conditional Movement Control Order (CMCO) until October 2020. Only important sectors are allowed to continue their operation with limited operational hours during the MCO and CMCO. The estimation of the sample size is 100 as the population size is unknown. But, the researchers attempted as much as possible to get the respondents among the full-

time workers. As a result, the survey only managed to collect 74 responses from the employee (41.9% male and 58.1% female). Participation in the survey was voluntary, anonymous, and without any reward. Participants were also informed that the content of the study would only be used for this research purpose and following the confidential principles.

Table 1 presents the IEQ that has been demonstrated in the questionnaire to test the significant relationship between the IEQ and the work stress level while working remotely during the MCO and CMCO. For this study, the items in IEQ have been modified to suit the research aims which is an attempt to identify the significant relationship compared with mental well-being and work stress level. The IEQ items applied not gave focus on the architectural and interior design quality, building facility quality, and standard of maintenance, but on environmental psychology. Besides, the effects on the state of indoor environment condition of the following variables were analyzed to achieve the research aim:

- i. Gender of the respondent
- ii. Years of working experience
- iii. Position
- iv. Category of family member
- v. Types of house

**Table 1.** List of Indoor Environmental Quality (IEQ) adopted in the questionnaire for the survey

Aspects	Questionnaire items	Survey questions	Rating scale
Spatial comfort	Personalization of work area	My home-working space can be adjusted or personalized to meet my preferences.	1 = Disagree 7 = Agree
	Degree of freedom to adapt	How satisfied are you with the degree of freedom to adapt your home-office space (e.g air conditioning, opening the window, lighting) to meet your preferences?	1 = Dissatisfied 7 = Satisfied
	Comfort of furnishing	Please rate how comfortable your home-office space's furnishing is (e.g chairs, desk, lamp, equipment).	1 = Uncomfortable 7 = Comfortable

	Cleanliness	Describe the level of cleanliness in your home-office space.	1 = Uncomfortable 7 = Comfortable
	Space for breaks	My home has a pleasant space for breaks and relaxation.	1 = Disagree 7 = Agree
Indoor quality thermal comfort	Air quality	Describe the satisfaction level of indoor air quality at your home.	1 = Dissatisfied 7 = Satisfied
	Temperature condition	Describe the level of comfort of indoor climate and thermal.	1 = Uncomfortable 7 = Comfortable
Noise distraction and privacy	Unwanted interruption	The home-office space's layout enables me to work without distraction or unwanted interruptions.	1 = Disagree 7 = Agree
	Visual privacy	My home-office space provides adequate visual privacy (not being seen by others).	1 = Disagree 7 = Agree
	Noise	Describe your comfort level of noise quality at home (not being overheard by others).	1 = Uncomfortable 7 = Comfortable
Visual comfort	Lighting	Describe your satisfaction level with the lighting comfort at home (e.g amount of light, glare, reflections, contrast).	1 = Dissatisfied 7 = Satisfied
	Color	What is the dominant color in your home?	N/A
Overall satisfaction	Overall work area comfort	How satisfied are you with the overall comfort of your home-office space?	1 = Dissatisfied 7 = Satisfied
	Productivity	How does your home-office space influence your productivity?	1 = Disagree 7 = Agree
	Health	1. Describe your stress level when joining or conducting the online meeting before the pandemic. 2. Describe your stress level when coping with the ICT tools during the outbreak.	1 = Negatively 7 = Positively

		<p>3. Do you feel any emotional exhaustion or burned out in the past few weeks?</p> <p>4. The factors that cause you emotional exhaustion or burned out.</p>
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*Modified from Rapoport, 1969; Vischer, 2007*

The results applied Standard Deviation (SD) for the IEQ questions because SD provides an indication of how far the individual responses to a question vary or deviate from the mean. SD will tell us how spread out the responses are. Are they concentrated around the mean, or scattered far or wide? Low standard deviation means data are clustered around the mean, and high standard deviation indicates data are more spread out. By using the Likert-scale measures, did all respondents rate the IEQ in the middle of the scale, or did some agree or satisfy, or disagree or dissatisfy? Looking at the mean alone tells only part of the story, yet all too often, this is what the research focuses on. The distribution of responses is important to consider and the SD provides a valuable descriptive measure of this IEQ.

## **ANALYSIS AND FINDINGS**

### **Respondents Profile**

This study included 74 employees (41.9% male and 58.1% female). The average age of the respondents ranges from 31 to 40 years (standard deviation 2.3, minimum 21, maximum 60). This range of age is known as the “active workers” category. Most respondents are professionals (e.g., teachers, lecturers, designers, accountants, and architects), as well as those working in sales and services, and were able to work remotely. Their nature of work could be freely conducted anywhere and anytime, or based on a flexible working style that only required them to work with information and communication technologies (ICTs), including smartphones, laptops, or desktop computers. In contrast, for other technical professions, such as plant and machine operators and technicians, working remotely is difficult because of the requirement to work on-site with tools, equipment, or machines. Approximately 58% of the respondents reported having 1 to 4 members of their household and 60% having at least one child, with 35% of them reporting having children younger than 12 years old. According to Galanti et al. (2021), there is a strong correlation between the number of people in a household and workers’ productivity when working from home. The higher the number of people in a household, the more likely workers to feel stressed, especially among women, resulting in low productivity and decreased performance.



The result also shows that 45.9% of the respondents are the head of the family which is slightly similar to the number of male respondents, and 54.1% are not the head of the family. As the head of the family, they play a major role in managing the household. Only 5.2% of the employees in the sample reported being involved in work-from-home (such as working as clerical support workers) before the pandemic and the rest of the respondents were work-from-home for the first time.

**Table 2.** Demography background of respondents

Particulars	Frequency (n=74)	%
<b>Age</b>		
21 – 30 years old	21	28.4
31 – 40 years old	25	33.8
41 – 50 years old	19	25.7
51 – 60 years old	9	12.1
<b>Gender</b>		
Male	31	41.9
Female	43	58.1
<b>Employment by Occupation</b>		
Professionals (e.g teacher, lecturer, manager, engineer, designer, accountant, architect)	17	24.0
Technicians and associate professionals (e.g lab assistants)	6	8.0
Manager	7	9.0
Service and sales (e.g sales and marketing, finance, hotel, telecommunication)	21	28.3
Clerical support workers (e.g administrative clerk, receptionist)	18	24.0
Crafted and related trade workers	2	2.7
Plant and machine operators and assemblers	3	4.0
<b>Working Years</b>		
1 – 5 years	25	33.8
6 – 10 years	29	39.1
More than 10 years	20	27.1
<b>Head of Family</b>		
Yes	34	45.9
No	40	54.1
<b>Number of Households</b>		
1-4	43	58.1
5-10	31	41.9
<b>Types of House</b>		
Detached (>3,800 sq ft)	11	14.9
Semi-detached (2,400 - 3,800 sq ft)	11	14.9
High-cost terrace (1,400 sq ft to 2,400 sq ft)	20	27.0

Medium-cost terrace (1,000 sq ft to 1,400 sq ft)	18	24.3
Low-cost terrace house (800 sq ft to 1,000 sq ft)	1	1.4
High-cost apartment (1,000 sq ft)	4	5.3
Medium-cost apartment (800 sqft to 900 sqft)	7	9.5
Low-cost apartment (700 sqft)	2	2.7

*Source: Collected from primary data*

As seen in table 2, the survey's aim is to ascertain how respondents' backgrounds and degrees of comfort with their home offices relate to their ability to work remotely from home. The demographic information is crucial to this study in order to assess whether the respondents have accurately reflected the intended target sample and to enable comparisons across a range of variables. According to the results, the respondents' ages ranged from 21 to 60 years old, indicating that they are a diverse working group. Most of the respondents belong to professional groups (e.g., teachers, lecturers, designers, engineers, it engineers, accountants, architects, or hr officers), which allows them to work from home as their roles do not demand physical work and do not require the physical presence of other personnel. This is followed by employees in the sales and services sectors, such as sales and marketing, finance, hotels, or telecommunications. Approximately 46% of the respondents are the heads of their families, and this can be related to the percentage of male respondents (41.9%), whereas 54.1% are not the heads of their families. This outcome is critical for understanding the roles that the heads of the family play in juggling household workloads, especially when there are more than 5 people in a household (41.9%). Working from home during the mco may become another factor that contributes to the well-being of workers' mental health.

Of the respondents, 27.0% reside in high-cost terrace homes, measuring from 1,400 square feet to 2,400 square feet, followed by those living in medium-cost terrace homes (24.3%). The limited space in the houses may contribute to the conflict of unclear psychological boundaries between home and work, resulting in more working hours per week compared to the usual office hours when working on-site. These extra work hours might be stressful and challenging for work-life balance. The finding is similar to that of several other secondary sources. Anka et al. (2020) reported that in the United States, 25% of remote workers feel that they are overworked. It indicates that they are engaged remotely for more than 40 hours per week. Of remote workers, 15% also attend more than ten online meetings per week. Besides, the limited space at home and the high number of people in a household prove to be difficult in terms of arranging a good home-office space. They may occupy an undesignated workspace such as the dining hall, the living hall, or the bedroom, since all rooms will likely be occupied.

Table 3 presents the reliability rate from the SD and mean value. The average SD is between 1.2 to 2.2 indicating that the responses were very

polarized, where most respondents had no reliability issues with rated on a scale of 7 points. The SD for high-cost terrace houses, low-cost terrace houses, and medium-cost apartments score the higher SD.

**Table 3.** The relationship between types of house and work stress when remote working during the pandemic

Types of House	1	2	3	4	5	6	7	N	Mean	SD
Detached	-	-	1	1	1	5	3	11	4.00	1.414
								15.0		
Semi-Detached	-	1	2	1	4	3	-	11	4.13	1.727
								15.0		
High-cost terrace	2	3	4	2	3	5	1	20	3.82	2.228
								27.0		
Medium cost terrace	1	1	1	2	1	6	2	14	3.43	1.902
								19.0		
Low-cost terrace	-	1	-	-	1	1	2	5	3.69	2.175
								6.5		
High-cost apartment	1	1	1	-	1	-	-	4	3.14	1.754
								5.4		
Medium cost apartment	-	1	1	1	1	2	1	7	3.44	2.128
								9.4		
Low-cost apartment	-	-	1	-	1	-	-	2	3.55	1.901
								2.7		
<b>Total</b>	<b>4</b>	<b>8</b>	<b>11</b>	<b>7</b>	<b>13</b>	<b>22</b>	<b>9</b>	<b>74</b>	<b>3.52</b>	<b>1.942</b>
	<b>5.4</b>	<b>10.8</b>	<b>15.0</b>	<b>9.5</b>	<b>17.5</b>	<b>29.7</b>	<b>12.1</b>	<b>100.00</b>		

Note:

1	No stress
2	Slightly stress
3	Somewhat stress
4	Moderately stress
5	Sometimes stress
6	Severely stress
7	Extremely stress

As illustrated in table 4, there are two types of home-office space: an isolated or specific home office and a flexible home office (irawanto et al., 2021). An isolated or specific home office is a dedicated work space with proper workstations (e.g., table or desk and chair) and hardware setup (e.g., monitor, laptop, printer, speakers, microphone, etc.) That has a sense of privacy and clear flow. Some respondents (68.9%) said that they have a flexible home office, which means they occupy spaces around the house, while 81.1% of them have an adjusted (modified) home office space. This result is related to the type and size of the house. Some respondents experience close interpersonal contact as they often use the same space for many activities, such as in the bedroom, which serves as their work space. A number of studies conclude that the use of space is not isomorphic among cultures. Each culture has specific variables that influence the use of space. Respondents may sometimes be working in the living room, the bedroom, or any unused room/space that can be converted into a home office space to meet their comfort and work needs.

**Table 4.** Types of home-office space among respondents

	N	%
<b>Type of home-office space</b>		
Isolated/specific home office	23	31.1
Flexible home office	51	68.9
<b>Adjusted and personalized home-office space</b>		
Yes	60	81.1
No	14	18.9

### **Home-office space assessments and environmental psychology when remote working**

Work stress or burnout in this current situation can cause role ambiguity, overwork, and role conflict, while time pressure can reduce job satisfaction, productivity, and performance. This study explored the home environment as a mediator for the relationship between work-from-home and the well-being of mental health. One of the space assessments is colour, which is an important variable in interior design as it is relatively easy to alter the atmosphere of an environment.

Table 5 illustrates the several dominant colors in the respondent's house; white, cold, warm, and monochrome color. 59.5% of the respondents have mentioned that white is their house's dominant color, followed by cold colors such as blue, green, and purple (24.3%), and warm colors such as orange, red, and yellow (18.9%), and monochrome only report 8.1%. The color green is associated with moods such as comfortable, calm, and serene, while orange color is associated with moods such as excitement, distress, and upset. Research on Goldstein's theory of color perception has found that red has stimulating effects

on human behavior and emotions (Kwalleket et al., 2005). The purpose of the study was to investigate the effects of red versus green room colors on individual perceptions of stress. It suggests a relationship between colors and emotions, with warm colors associated with aroused feelings and cool colors with calming ones. Previous research led to the hypothesis that subjects would have higher scores on the Depression, Anxiety, and Stress Scale when tested in red color in a room compared to a green or white room. Besides, previous studies also have assessed effects on overall mood there is evidence that the significant effects of a bright red room may have effects on human stress, degree of uncertainty, fear, and physiological responses. However, the most dominant color in the respondent's house is white as white is a standard color that does not affect any moods and emotions (Kwalleket et al., 2005). In this case, determining factors of life stress is important for all workers, and the environment is often overlooked as a trigger to emotional states of being when working from home.

**Table 5.** The dominance of color in respondents' home

<b>The dominance of color at home</b>	<b>N</b>	<b>%</b>
White	44	59.5
Cold colors	18	24.3
Warm colors	14	18.9
Monochrome colors	6	8.1

Table 6 presents the list of environmental psychology that this research applied to test how they affect the worker's comfort level for a space for a break and relaxation when working remotely. There are ten (10) criteria tested including the space for break and relaxation, lighting, indoor climate and thermal comfort, noise quality, indoor air quality, space without distraction or unwanted interruption, visual quality, furnishing, cleanliness, and degree of freedom.

**Table 6.** The comfort level of respondents' home-office space

<b>Pleasant spaces for break and relaxation</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very disagree	1	1.4	5.42	1.44
Disagree	2	2.7		
Slightly disagree	4	5.4		
Neither agree nor disagree	11	14.9		
Slightly agree	18	24.3		
Agree	16	21.6		
Mostly agree	22	29.7		

For the assessment of pleasant spaces for break and relaxation, the respondents are required to respond from very disagree to mostly disagree on their spaces for a break and relaxation at home. The SD of 1.44 shows that the individual responses on average were far over 1 point away from the mean of 5.42. The N value supports the result of SD that most of the respondents mostly agree that they have a pleasant space for break and relaxation. The space may be the bedroom, balcony, yard, or living room.

**Table 7.** The lighting comfort of respondents' home-office space

<b>Lighting comfort</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very disagree	1	1.4	5.45	1.21
Disagree	4	5.4		
Slightly disagree	9	9.5		
Neither agree nor disagree	11	12.2		
Slightly agree	15	20.3		
Agree	12	16.2		
Mostly agree	22	29.7		

Most of the respondents (29.7%) mostly agree with the lighting comfort of the home-office space. The satisfaction of lighting comfort includes the amount of light, glare, reflections, and contrast. The SD of 1.21 presents that the individual responses on average were over 1 mean away from the mean of 5.45.

**Table 8.** The indoor climate and thermal comfort of respondents' home-office space

<b>Indoor climate and thermal comfort</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very uncomfortable	3	4.1	4.84	1.58
Slightly uncomfortable	4	5.4		
Uncomfortable	10	13.5		
About half of the time	6	8.1		
Little comfortable	22	29.7		
Usually comfortable	20	27.0		
Very comfortable	9	12.2		

Only 29.7% (or 22 respondents) of the respondents said that they are little comfortable with the indoor climate and thermal in their house which affects their productivity level when working from home and contributes to well-being. On a basis, thermal comfort can be assessed through the design of the building and heating, ventilation, and air conditioning systems, to provide comfort. The value of SD is 1.58 presents that the individual responses on average were over 1 mean away from the mean of 4.84, a bit lower than other IEQ.

**Table 9.** The indoor air quality of respondents' home-office space

<b>Indoor air quality</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very dissatisfied	2	2.7	5.34	1.50
Dissatisfied	2	2.7		
Slightly dissatisfied	6	8.1		
Neither satisfied nor dissatisfied	9	12.2		
Sometimes satisfied	10	13.5		
Satisfied	30	40.5		
Very satisfied	15	20.3		

40.5% or 30 of the respondents were satisfied with their indoor air quality at home. The value of SD is 1.50 presents that the individual responses on average were over 1 mean away from the mean of 5.34. The larger value of the mean states that the scale congregates on the satisfying scale.

**Table 10.** Types of home-office space's layout and respondent's comfort level

<b>The home-work office's layout enables work without distraction or unwanted interruption</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very disagree	7	9.5	4.57	1.76
Disagree	4	5.4		
Slightly disagree	8	10.8		
Neither agree nor disagree	12	16.2		
Slightly agree	13	17.6		
Agree	24	32.4		
Mostly agree	6	8.1		

32.4% of 24 respondents agree that their home-office space's layout enables them to work without distraction or unwanted interruption such as noise, children, furniture, or others. This result supports the response that 68.9% of the respondents have a flexible home office and they can be adjusted and personalized according to their preferences and comfort level. The SD of 1.76 is slightly higher compared to other IEQ attributes, while the mean value is 4.57. It shows that the individual responses on average were far over 1 point away from the mean of 5.42.

**Table 11.** The visual privacy of respondents' home office space

<b>Visual privacy</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very disagree	10	13.5	4.32	2.035
Disagree	7	9.5		
Slightly disagree	11	14.9		
Neither agree nor disagree	6	8.1		
Slightly agree	13	17.6		
Agree	15	20.3		
Mostly agree	12	16.2		

The survey found that the distribution of the mean for visual privacy in their home is regular. Only 17.6% and 20.3% of the respondents slightly agree and agree that they have good visual privacy. Respondents who are working from home are significantly more likely to have a partition or segregate space that is able to maintain privacy by means of doors and physical layouts. Rapoport (1969) explains that the English are also private people, but manage their psychological distance from others via verbal and non-verbal means such as voice/sound and eye contact. The SD of 2.03 and mean value (4.32) are slightly lower compared to other IEQ attributes.

**Table 12.** The comfort level of respondents' furnishing home living

<b>Comfortable furnishing</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very uncomfortable	1	1.4	4.99	1.512
Slightly uncomfortable	5	6.8		
Uncomfortable	8	10.8		
About half of the time	10	13.5		
Little comfortable	16	21.6		
Usually comfortable	24	32.4		
Very comfortable	10	13.5		

From the results, it can be reported that most of the respondents scored comfortable furnishing. In the enterprise working environment, they are working from home routinely enlarged and positive change in social recognition of the contactless-working style expanded with the settlement of a new working environment. A new space-created home furnishing is required for sharing work and rest beyond the existing interior concept. Home furnishing includes furniture, lighting, wallpaper, bedding, carpet, and interior equipment. The interior environment style needs to be created as a new one to satisfy the needs of the comfort home furnishing in various aspects such as aesthetics, function, and



economic utility for making their interior environment for the main space for working and relaxing.

**Table 13.** Level of cleanliness of respondents' home office space

<b>Level of cleanliness</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Slightly poor	1	1.4	5.73	1.076
Poor	2	2.7		
About half of the time	5	6.8		
Clean	18	24.3		
Usually clean	30	40.5		
Very clean	18	24.3		

The majority of home-office respondents reported that the level of cleanliness was clean to extremely clean, while 40.5% of respondents rated their space as usually clean because they always maintain their space tidy to improve their comfort and mood. The SD of 1.076 shows that the individual responses were significantly different from the mean of 5.73.

**Table 14.** Degree of freedom of respondents' home office space

<b>Degree of freedom (e.g air conditioning, opening the window, lighting) to meet respondents' preferences</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Dissatisfied	1	1.4	5.43	1.228
Slightly dissatisfied	6	8.1		
Neither satisfied nor dissatisfied	9	12.2		
Sometimes satisfied	15	20.3		
Satisfied	30	40.5		
Very satisfied	13	17.6		

Respondents were asked how much their home office space influenced their daily productivity. Most of the respondents rate the degree of flexibility in their home office space as occasionally satisfactory to extremely satisfactory. It can be stated that most respondents' homes have adequate lighting and ventilation, allowing them to receive sufficient amounts of sunlight and thus increase their productivity and focus. Furthermore, most urban houses built in the 2000s were planned with excellent natural light and ventilation to comply with local authority requirements for house design.

**Table 15.** The respondent’s daily productivity when working from home amid the Covid-19

<b>Daily productivity</b>				
	<b>N</b>	<b>%</b>	<b>Mean</b>	<b>SD</b>
Very negative	1	1.4	5.20	1.303
Negative	1	1.4		
Slightly negative	4	5.4		
Neither negative nor positive	16	21.6		
Slightly positive	18	24.3		
Positive	22	29.7		
Positively	12	16.2		

On average, only 27% of the respondents rated their daily productivity as positive and slightly positive, while 2.8% reported it to be extremely negative and negative. Despite this, it can be said that the distribution of daily productivity percentage is more on a positive scale. This shows that employees did not have any issues working from home as their organisations have introduced flexible-working options amidst the MCO and CMCO. Employees were able to cope with their workloads and technological tools. Besides that, they could also cope with the appropriate technology and its equipment when working from home, especially when meetings need to be held virtually. The SD of 1.30 shows that the individual responses were significantly different from the mean of 5.20. The N value supports the result of the SD, that the distribution of the mean is far from 1 point, being closer to 5 to 7 points.

## **DISCUSSION**

The questionnaire survey results revealed new insights into the variables of indoor environmental quality that influence workers’ behaviour when working remotely, such as their mental health and perceptions of their living environment. COVID-19 provided the world with the opportunity to experience working from home, which had long been a desirable work option for many organisations worldwide. According to preliminary research on workers’ reactions to working from home for the first time, the initial reactions to the new working arrangement appear to be favourable. The survey discovered that workers aged 21–40 years had to juggle home and work commitments simultaneously for both their husband and wife, especially those who are the heads of their families. For those who stay with more than 5 people in a household in a metropolitan area, living with limited space, such as in high-rise apartments, results in many distractions, discomfort, and an imbalanced work-life. Hence, learning how to manage remote work can reduce the perception of family-work conflict. In addition, organisations must support employees’ time management skills, which will enable them to divide the

two spheres equitably. Employees ought to provide the right attention to the right task at the right time to minimise distress and promote their own mental recovery.

Aside from job conditions and work-from-home opportunities that contribute to the well-being of mental health, the IEQ, as one of the components of the built environment, plays an important role in promoting good mental health. The IEQ aspects include spatial comfort, thermal comfort, noise distraction and privacy, and visual comfort. Every aspect has 15 items to ask the respondents regarding their home office space. Using a seven-point Likert scale to measure employees' satisfaction, agreement, and comfort level in the home-office space, the results indicate that the respondents' home office space is of the adjusted (modified) type, which allows them to rearrange the space layout according to their comfort level and working needs. However, this may depend on several factors, such as the type and size of the house, floor area, and the number of people in the household. Most of the respondents were satisfied and scored high levels of comfort in several IEQ aspects, such as a dedicated space for break and relaxation (e.g., balcony, bedroom, study room, living hall), lighting, indoor air quality, cleanliness, degree of freedom, and furniture arrangement. These aspects scored a mean of more than 5 and a SD of between 1.0 and 1.2, which is close to the positive value.

No significant relationship was observed between IEQ and productivity levels. Most of the respondents felt slightly positive and positive when working from home. Only some of them were unable to describe whether they felt negatively or positively or felt totally positive about their daily productivity levels. The results prove that workers may have strong self-leadership and autonomy, and these two criteria have a positive relationship with work-from-home productivity during the COVID-19 pandemic. Future studies are recommended to incorporate job demands from a more diverse employment sector with a different position on the relationship between work-from-home demands and IEQ.

Despite the strengths of the current view, such as its rigorous theoretical framework and the breadth of literature it provides, some limitations need to be addressed. This study focused on a specific time frame during the MCO. Consequently, future research may reach different findings and conclusions, especially with regard to working from home among female workers as a norm to adapt to certain crises. The results demonstrate a strong relationship between working from home and IEQ. Most of the respondents were comfortable and satisfied with their present indoor environmental quality. However, this study did not intend to test the relationship between indoor environmental quality and productivity when working from home, although there is a question in the survey regarding productivity and stress. In conclusion, the present study achieved the first hypothesis: working from home is positively related to indoor environmental quality, although many other variables provide only a small account of the many

dynamics underlying the complex phenomenon of work-from-home practice. On this basis, it is important that future studies take other constructs into consideration, with a more specific research design and a more representative sample, particularly on job and personal resources.

## **CONCLUSION AND RECOMMENDATIONS**

Overall, the findings suggest the importance of IEQ on individuals' comfort and mental well-being when working from home, as this has become a new policy in most Malaysian organisations following COVID-19. From the results, most of the IEQ scores were more than 1 and had the highest mean, which demonstrates a positive scale. The respondents' input on IEQ also indicates their mental well-being since IEQ strongly affects workers' stress and productivity levels when working from home. However, despite limitations due to a relatively low number of respondents, this study recommends extending the research to include gender and productivity levels that may affect employees' mental well-being (the third hypothesis—Factor 3) as a result of working from home. These have a positive influence on work stress due to other factors such as social isolation, work-life balance, and family commitments. The COVID-19 pandemic has forced workers to engage in extra work, even going so far as to work overtime because they must complete their assigned tasks. This study also found that in the early stages of the pandemic, workers were still adapting to the new norm of working from home and familiarising themselves with their home-office space setup. These have affected their comfort, productivity, and stress levels. Therefore, future research should aim to explore how this relationship may affect organisations in terms of their readiness levels when the work from home policy is implemented.

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## **URBAN GOVERNANCE APPROACHES FOR LOW CARBON CITIES. THE CASE OF SHAH ALAM LOCAL GOVERNMENT, MALAYSIA**

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### **Abstract**

Climate change is an alarming phenomenon, and no conquering mechanisms or global winning standards are available to reduce carbon footprints. Nevertheless, local governments still strive to formulate successful tactics to sustain their cities, including Low Carbon City (LCC) initiatives. However, it is widely accepted that institutional frameworks and urban governance may influence the effectiveness of LCC implementation. In this paper, we impart how the notion of urban governance affects LCC implementation. The study aims to examine the perennial topic of the urban governance approaches to LCC that have been adopted by local governments, using the Shah Alam local government as a case study. Benchmarking exercises were conducted through a detailed literature review of the existing LCC initiatives, together with a focus group discussion (FGD). The FGD session was framed through purposive sampling, with participants selected from the local government of Shah Alam, the city's community, and the stakeholders involved in the LCC programs. The results demonstrated that urban governance is vital in implementing LCC through many approaches, like the institutional framework, practices, and delivery. Overall, the study findings suggest a crucial component in the Shah Alam local government's management of LCC implementation.

**Keywords:** Carbon Footprint, GHG Emissions, Action Plan, Urban Governance, Low Carbon City (LCC)

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## **THE BACKGROUND**

This paper presents the outcome of a sequel to a Low Carbon City (LCC) study. This second study is interrelated with the first research project and, in fact, tied together as it complements the earlier study. Following on from that first research, the current study continues with a similar topic but was designed to enable further investigation and amplify the role of urban governance in LCC initiatives. The previous research established the essential need to embrace and achieve a Low Carbon City, including the elements of good governance and the institutional framework required to embody and administer an LCC initiative. Meanwhile, this study was streamlined to focus on the function of the LCC institutional framework and governance through practical strategies and programs. Hence, this study was conducted to accommodate the local government's use of more detailed tactics to ensure the efficacy of its LCC delivery. The aim was to examine the LCC practice and approaches adopted through urban governance by Shah Alam City Council (known as *Majlis Bandaraya Shah Alam* – MBSA). Before presenting the results from this study, this paper begins with the contextual background.

### ***The Issues***

To understand the issue of urban governance in regard to LCC, it is better to first comprehend the bigger perspective, i.e., to understand what leads to the concept of LCC. To date, no substantial and acclaimed development concept exists to reduce carbon footprints and eliminate Greenhouse Gas (GHG) emissions. Cities worldwide have introduced many approaches to address carbon footprints and reduce GHG emissions, yet no single method can be deemed a global and unified standard. A carbon footprint is defined as the total carbon dioxide emissions generated by human activities over a certain period. Carbon footprints are caused by food, consumption, transportation, and household energy (Energy Education, 2018). Carbon dioxide (CO<sub>2</sub>) is said to form the highest portion of GHG emissions (United States Environmental Protection Agency, 2021). The LCC, on the other hand, means an urban sustainability practice that reduces carbon footprints, including from human activities, but incorporates a low-carbon society through partnerships involving governments, private agencies, and communities (Ismaila Rimi & Yakubu Aliyu, 2019).

As urban populations grow, cities are increasingly facing challenges, including the environmental impacts of climate change (World Bank, 2014). By 2030, it is estimated that 60% of the world's population will reside in urban areas. This would result in massive carbon footprints in urban areas if actions are not taken accordingly. Cities must seriously consider sustainable development approaches and adhere to global policies and strategies for sustainable development.

Part of the strategies to address the issues of climate change and practise sustainable development is to practise Low Carbon City (LCC) intervention. At a local government level, the local authorities can integrate sustainable development for their cities through the LCC strategies. LCC initiatives and strategies can position cities as key players in tackling climate change. However, it has been stressed by the World Bank (2014) that the success of the LCC concept relies on strategic planning. To do this, an LCC requires a robust institutional background and structure. Good governance involves the element of effective coordination and, to achieve LCC status, municipalities play a highly significant role in administering the implementation. This condition was highlighted as far back as 2014, yet the issue of whether there is a need for a specific entity or unit to govern LCC implementation is still being addressed, even in Malaysia.

Kearn and Paddison (2000) claimed that the issues or challenges of urban governance include interurban competition, a homogenising global culture, the interrelationship between all levels of authority, as well as the need to attempt cross-border corporation and trans-frontier networking. Interurban competition between city authorities to obtain investment has caused a change in the basic concept of urban governance from the welfare state model to the economic development model. The common issues faced by urban governance are providing adequate access for the poor, developing practical solutions to complex challenges, and, most importantly, addressing the local context in terms of economics, politics, and social relations (Pierre, 2011). Other than that, urban governance issues also include the inconsistency of implementation, the absence of dedicated units at all levels, and the shortage of capable people (KASA, 2021). Lee (2019) stated that many Malaysian cities had established their LCC action plan, and 52 local authorities had signed up to the LCC Framework Program, which focuses on strategies at a local level. In 2020, the Malaysian government produced an important LCC policy, the National Low Carbon Cities Masterplan (GTALCC, 2020). The LCC Masterplan was created to encourage selected cities in Malaysia to venture into the LCC concept and practice in their city development. The government, therefore, streamlined several cities into specific target groups aiming for carbon neutrality by 2050 (for Group 1, containing 15 cities) or in 2050 (for Group 2, with 11 cities, and Group 3, consisting of seven cities). Shah Alam City fell into the Group 1 category, obliging it to achieve carbon neutrality by 2050. The government also stated that a "governance and implementation framework" should become one of three (3) key drivers of the LCC, besides urban planning and community participation. In this sense, it is accepted that the governance component plays a vital role in ensuring the efficacy of an LCC initiative. Apart from that, the government also accentuated the essential application of technology in LCC implementation, which involves the



practice of green technology in governance, whereby technology can bridge multiple mandates and policy directions.

To date, there is no structured or specific database system at the local governments of either Shah Alam or Petaling Jaya just for low-carbon city data purposes. Data are fragmented across the departments within the local authorities, which causes difficulties in retrieving, recording, or measuring the performance of the low-carbon index. This issue was highlighted in the National Low Carbon Cities Masterplan (Ministry of Energy, Science, Technology, Environment, and Climate Change, 2020). There is a need to change the conventional way of recording and retrieving data for low-carbon cities. At present, data are kept by separate departments according to the subject matter. This conventional way of data recording must be changed. A structured database system (of green technology) may ease the operations and processes involved in the administration and management of such an initiative.

The government also suggested a strategy to develop a single window and seamless links to data, information, and resources; and to provide a common set of performance management metrics for evaluating emissions in the delivery of a low-carbon city intervention. In addition, it was claimed in the National Green Technology Master Plan 2017-2030 that one (1) of the five (5) Strategic Thrusts to mainstream green technology is the strengthening of the institutional framework (Ministry of Energy, Green Technology and Water, 2017). This means a green technology form of institutional framework is required (Ministry of Energy, Science, Technology, Environment and Climate Change, 2020). The Sustainable Energy Development Authority (SEDA) Malaysia has also emphasised technical issues such as the difficulty of obtaining specific data exchange, the lack of integration across internal departments and external agencies, the lack of comprehensive and up-to-date information, the absence of key elements, and the unstable system of the existing track.

This paper, therefore, aims to examine the LCC initiative carried out by a local government in Malaysia, namely Shah Alam City Council (or *Majlis Bandaraya Shah Alam*), and the approaches for urban governance adopted to ensure the effectiveness of the LCC implementation.

## **LITERATURE REVIEW**

### ***The Concept of the Institutional Framework and Urban Governance Approach***

Generally, an institutional framework is seen as an organisation with a complete system, rules or standards, decision-making procedures, and programs, which assigns roles to governance nodes and guides the interactions between the people involved. Meanwhile, governance means the way an organisation governs and practices or conducts its actions, including the power, authority, and interaction

processes of the parties involved (Patrick, Serrat, & Agyare, 2019). An institutional framework is a broad concept that concerns the functions of governments, private enterprises, political jurisdictions, judicial systems, legislative bodies, and regulatory agencies. The institutional system refers to the structure of government and its agencies, independent think tanks, and private sector services (Jeyasundar, Ali & Zhang, 2020). An institutional framework often represents the contact points between a project and the host government. As the basic structure of the local institutions, the institutional framework is essential in many respects for the viability of projects (Clews, 2016). It can also be referred to as a set of formal organisational structures, rules, and informal norms for service provision. Such a framework is seen as the precondition for successfully implementing intervention tools; it therefore requires careful attention (Peters, 2020).

Urban governance, on the other hand, means a "self-organising network, characterised by interdependence, resource exchange, rules, and significant autonomy to the state" (Rhodes, 2018). This includes the concept of continuous interaction between the network members caused by the need to exchange resources and the negotiation process. Pierre (2011) described urban governance as a process whereby local institutions implement their programs with the involvement of civil society to gain potential and influence in urban politics. It is also seen as a multi-level activity involving higher tiers of government that seek to shape what they do and have connections with lower levels of governance at the locality and neighbourhood levels. They often seek relations with such institutions to form new alliances of cooperation and are the subject of regulations and expectations from such bodies (Kearn & Paddison, 2000). Apart from that, urban governance searches for new ways to be creative, build strengths, and access and utilise resources. This is particularly true at the scale of the locality and neighbourhood.

An institutional framework ensures the efficient flow of data between system components. The crucial parts of this framework include the governance framework (two (2) tiers of institutions), the organisational framework (planning authorities), the legislative framework (planning laws), and the administrative framework (structure). These frameworks determine the management and regulation of urban development (Mallo, 2015). The relationship between the institutions of governance and the components of the institutional framework and its structures would ensure central control and domination at any level of government. In the long run, these will contribute to the performance of the authorities (Mallo, 2015). Therefore, an institutional framework needs its structures, administration, governance, and management to ensure the effectiveness of the authorities' activities.

### ***Examples of Urban Governance for LCC in Other Countries***

This study also examined some practices governing LCC in other countries. In Germany, the National Urban Development Policy was created in 2007 after the Leipzig Charter on Sustainable European Cities (BVMBS, 2012). Prepared by federal, regional, and local officials, this policy is managed by the Federal Ministry of Transport, Building, and Urban Development (BMVBS, 2012). The policy established a national framework for better urban governance for sustainability. Significant outputs have included creating funding streams for innovative urban projects, developing an online portal for sharing best practices, and establishing a board to advise ministers on implementing national urban development policies.

Meanwhile, in Mexico, the municipal governments oversee urban planning, water distribution, waste management, roads and transit, and public spaces in Mexico's cities. State governments set property tax rates, which vary widely. Cities depend heavily on federal funding (UCLG & OECD, 2016). Mexico's climate change policy is also well developed. Mexico passed a Climate Change General Law in 2012 and introduced the 10-20-40 National Climate Change Strategy in 2013 and the Climate Change Mid-Century Strategy in 2016. The government also created the National System on Climate Change to coordinate climate action across federal, state, and municipal levels. The national policies aim to reduce emissions by 22% below business-as-usual levels by 2030 and 50% below 2000 levels by 2050 (SEMARNAT, 2013).

Meanwhile, China has varying levels of governance like the national, provincial, prefectural, county, and local governments, as well as its urbanisation and carbon emissions goals. One aspect of urban governance was introducing the 13<sup>th</sup> Five-Year Plan, which aims to increase the urban population, amount of affordable housing, and number of urban jobs. The plan suggests more significant policies, resources, and coordination between all levels of government to achieve these goals (China, 2016). Table 1 summarises the urban governance approaches adopted to lower carbon emissions.

**Table 1:** Urban Governance Approaches for LCC in Selected Countries.

Country / Target	Approaches
Largely Green House Gases emissions neutral by 2050 (near-term goal of reducing emissions by 40% by 2020)	<ul style="list-style-type: none"> <li>• A national building code that emphasises energy-efficient buildings and brownfield development</li> <li>• A program for refurbishing existing building stocks</li> <li>• Targets for renewable energy generation</li> <li>• A national energy tax and sectoral energy policies contribute to Germany having the highest levels of energy efficiency in the world.</li> <li>• Reducing reliance on coal for energy, reducing the need for heating oil, limiting transportation emissions, and improving industrial efficiency</li> </ul>
National Urban Development Programme (set out goals of reducing emissions 22% below business-as-usual by 2030 and 50% below 2000 levels by 2050 relative to business-as-usual).	<ul style="list-style-type: none"> <li>• Controlling urban sprawl and consolidating existing cities</li> <li>• Creating an urban development model that makes well-being for city dwellers and guarantees social, economic and environmental sustainability</li> <li>• Designing and implementing normative, fiscal, administrative and regulatory instruments for land use management</li> <li>• Promoting a sustainable mobility policy that ensures the quality, availability, connectivity and accessibility of urban trips</li> <li>• Avoiding human settlements in risk zones and reducing the vulnerability of urban populations to natural disasters</li> <li>• Consolidating the National Regional Development Policy based on local economies' capabilities and potential</li> </ul>
National New Urbanization Plan 2014–2020 (reduce the carbon intensity of the economy (CO <sub>2</sub> emitted per unit of GDP) by 18%, and energy intensity (energy consumption per unit of GDP) by 15% over the five years to 2020)	<ul style="list-style-type: none"> <li>• The establishment of a national emissions trading scheme (ETS)</li> <li>• One of the guiding visions is of an “ecological civilisation” characterised by low-carbon development</li> <li>• Pursuing low-carbon urban development through low-carbon city pilots</li> <li>• Participating cities created low-carbon development strategies, established GHG inventories, and implemented a range of low-carbon initiatives, including energy efficiency, distributed energy, and public transit systems</li> <li>• Promoting renewable energy</li> <li>• Public transport facilities and green buildings</li> </ul>

*Source: Broekhoff, D., Piggot, G., & Erickson, P. (2021).*

### ***Shah Alam's Early Approach To LCC***

Malaysia, a small country in Southeast Asia, has long supported the international urban agenda for sustainability and tried to make cities better places to live. Shah Alam, situated in the State of Selangor, Malaysia, is one of the many major cities that sought and adopted a recognised approach to tackling the carbon footprint issue, i.e., the LCC concept. Shah Alam, a famous city with almost 120 million search results from the Google search engine (Google, 2022), is a highly urbanised Malaysian city that aspires to strengthen its sustainability approach by adopting the LCC concept in its development and plan. This effort is not a novel sustainability scheme for the city, but an extension of the many initiatives introduced by the city in early 2000.

The past 40 years have witnessed massive growth in the urban development and economy of Shah Alam, which has transformed the city into an industrial city. Population growth increased tremendously due to industrial activity, and new housing schemes were expanded. The city grew tremendously and was estimated to have 617,149 inhabitants in 2022 (Population Hub, 2022). The profound changes in human activities and the built environment escalated the development of infrastructure and urban transportation, making the city unable to escape the issues of carbon footprints and increased carbon emissions. To make things worse, the demand for mobility and accessibility increased at the same rate for cities like Shah Alam (Abd Rahman and Abdullah, 2016). Scholars have claimed that transportation contributes significantly to carbon emissions (Nasrudin et al., 2020). This inevitably affects the environment and the urban dwellers' quality of life. A low happiness level is thought to result from low satisfaction with living conditions (Abdullah and Zulkifli, 2015)., while mental illness increases due to a poor physical environment, which includes poor air quality (Marzukhi, Ghazali, Leh and Abdullah, 2020).

The Malaysian government has pledged to protect its environment and commit to promoting a sustainable environment and living conditions. One government initiative is the creation of the National Low Carbon Cities Framework and Assessment System (LCCF) in 2011 by the Ministry of Energy, Green Technology, and Water, intended to be practised by local governments. The LCCF was designed to introduce a framework for promoting sustainable development that would reduce carbon emissions through four (4) main development aspects: the urban environment, urban transport, urban infrastructure, and building (KeTTHA, 2011). Local authorities applied the framework and assessment guidelines to measure the baseline and reduction in the carbon count. The initial purpose of the LCCF is to encourage cities to move towards zero-carbon in the future. Following the establishment of the LCCF, the Shah Alam City Council (SACC) has taken a step further by formulating its own LCC Action Plan for 2017 to 2030.

However, when the LCCF was introduced in 2011, the role and responsibilities of the local authorities in terms of administration and management were not addressed extensively. Also, the context and composition of the subject matter are specifically designed to calculate carbon emissions. The concept of LCC development and the elements of governance were not covered. Furthermore, before then, no document in Malaysia could guide an LCC scheme. Apart from that, preliminary work also revealed the absence of mechanisms and studies focusing on urban governance for LCC for local governments in Malaysia.

Before 2017, it was rare to find documents produced by local authorities referring to their experience of attempting to pursue an LCC concept in their cities. Moreover, no LCC action plan has been produced by any local authority in Malaysia, except for Subang Jaya. Shah Alam, however, took its chance and initiated her first ever LCC Action Plan, which comprises five (5) strategic development thrusts: (1) Transportation and Mobility; (2) Built Environment; (3) Waste Management; (4) Energy and Water; and (5) Administration and Management through Green Technology (Majlis Bandaraya Shah Alam, 2017). The LCC Action Plan produced in 2017 was a city council strategy to complement the LCCF imposed by the government. Nevertheless, in this action plan, the strategies drawn in relation to administration and management were not comprehensively interpreted. For that reason, SACC decided to review its 2017 LCC Action Plan and produce a newly enhanced action plan to systematically address the components of governance such that they would suit the capacity of the city and the local context in regard to LCC.

## **METHODOLOGY**

The study focused on urban governance at a local level. Previous scholars have demonstrated the use of qualitative measures when dealing with administration, management, policies, regulations, strategies, and principles (Ariff, Samsudin & Ahmad, 2021; Husin, M.Z., Usman, I.M.S. & Suratman, R., 2021; Dauda, Ahmad & Keling, 2020). The intention of the study was to examine the existing LCC policies and strategies that have been formulated and the actions taken by a local government to strengthen the institutional framework. This study, therefore, primarily applied a qualitative approach and concentrated on document reviews from secondary data, while it also analysed the primary data obtained from focus group discussions (FGD) involving 22 representatives from various backgrounds.

Therefore, this study embraced a sequential exploratory investigation to obtain the information from the participants systematically. The approach involved a two-phase design method, whereby the qualitative data was first collected from the existing literature, and this was followed by the FGD session. To investigate the strategies for urban governance employed by a local government in relation to LCC, the study also applied the case study method.

Greater attention was paid to a local government in the State of Selangor, Shah Alam City Council (SACC), also widely known as *Majlis Bandaraya Shah Alam* (MBSA). The data from the FGD was analysed by employing the ATLAS.ti software. This approach enabled the researchers to understand the significant criteria for urban governance when implementing the LCC initiative. In this paper, the acronym MBSA is widely used as this is the common name used by the local public. MBSA was selected as the case study based on its background and practice in regard to LCC efforts. Also, the Malaysian Government had targeted the city of Shah Alam as one of the many major cities in the country which should implement an LCC scheme. As mentioned earlier, the National Low Carbon Cities Masterplan created in 2020 (GTALCC, 2020) categorised Shah Alam into Group 1 of the many LCC targets, which deliberately positioned the city as one of the 15 in Malaysia that were to achieve carbon neutrality by 2050. Therefore, the Shah Alam local authority is striving to address the city's Low Carbon City planning and development, as well as meet the nation's aspirations.

Preliminary work included a detailed review of the existing literature on LCC, international LCC missions, and local policies and strategies. Content analysis was employed for the secondary data. The scoping method suggested by Arksey and O'Malley (2005) and the technique applied by Abd Rauf et al. (2021) were exercised through a systematic approach. The scoping method involved five (5) phases, whereby secondary data extraction involves: (1) data gathering (of related previous studies); (2) justification of the study objective (by framing the scope of the study); (3) grouping the secondary data into separate themes; (4) classification of the data according to subjects; and (5) designing the conceptual framework. The variables were identified from this preliminary task, as presented in Table 2 below. Those variables became the leading indicators for measuring the criteria that could aid the governance involved in administering and managing LCC initiatives at local government level.

To examine the variables connected to an effective LCC delivery, the study included an FGD session comprising 22 participants from 12 organisations. The researchers selected participants with knowledge of or experience in LCC from numerous backgrounds, including from the academic field, local authorities, developers, the State Economic Unit, Malaysian Federal Government Statutory Bodies, the Department of Town and Country Planning (Federal), and the Department of Town and Country Planning (State of Selangor).

The intention was to gather information, experience, and ideas from those involved directly in LCC efforts. The participants were selected using purposive sampling based on several criteria but which involved certain constraints: (1) the exact expertise involved in LCC governance is not available; (2) there were difficulties in getting participants from the field; (3) there were

time constraints; (4) the investigation required in-depth assessment; and (5) there is no specific sample size formula (World Food Programme, 2009). By employing the purposive sampling approach, the research team was not committed to restricting or justifying the number of participants used in the samples, provided that they might offer relevant inputs (World Food Programme, 2019).

**Table 2: Variables for Study and Relationship with Urban Governance Criteria**

<b>Variables</b>	<b>Criteria</b>
LCC Guideline	Guide or instruction to deliver LCC efforts.
Low-Carbon Zone	Areas where the most polluting vehicles are regulated. Generally, vehicles with higher emissions cannot enter the area.
Champion	A champion facilitates change, can see the mission for change, and supports the team in integrating the new transformation. A champion is key to a successful outcome of organisational change.
Job Description	It is a record or written statement that informs all the related job information. It will portray the job content, environment, and conditions.
Capacity Building	Capacity building engages in cultivating and intensifying an organisation's skills, talents, practices, and resources, along with changes in attitudes and behaviourism.
Funding	Money that a government or organisation provides for a particular purpose.
KPI	A Key Performance Indicator is a measurable value portraying the achievement of certain aspects of an organisation.
Work Plan	A strategy or schedule is proposed for a specific project.
Database Centre	A physical facility stores applications and data with a computing and storage resources network.
Partnership	A formal agreement between two or more parties or organisations or people
Green Procurement	The purchase of goods and services will only bring minimal adverse environmental impact.
Green Finance	A sustainable financial system that serves long-term the need for an environmentally friendly financing system.
Benchmarking	Benchmarking enables an organisation to learn from the best standard of performance.
Monitoring	To watch and check a situation for a certain period

*Source: Adopted from Urban Access Regulations in Europe (2022); Weebly (2022); iEduNote (2022); United Nations (2022); Collins (2022); Klipfolio (2022); Lexico (2022); Cisco (2022), Byju's (2022); GEP (2022); Green Finance Platform (2021); InspireOne (2022); Cambridge Dictionary (2022)*



## **RESULTS AND DISCUSSION**

It has been observed that all cities in Malaysia must adopt a sustainable development approach, and one of the mechanisms for doing so is practising the LCC concept and practice. Nevertheless, the pre-requisite highlighted by the government suggests that LCC initiatives be carried out through a structured institutional body (GTALCC, 2020). Furthermore, to ensure the effectiveness of an LCC intervention, the green technology element must be practised in urban governance. Following that manifesto, Malaysia is now striving to ensure her cities have Low Carbon City status by 2050. Shah Alam, a highly urbanised city, was placed in Group 1 of the target cities and therefore aims for carbon neutrality in 2050. Group 2, on the other hand, is targeted to attain a 66% reduction in absolute GHG emissions in 2045 and carbon neutrality in 2055. Meanwhile, Group 3 is required to achieve carbon neutrality by 2060.

In the context of the Malaysian scenario, the study revealed several critical issues concerning the current practice of the institutional framework and urban governance for LCC initiatives in the country, including for the city of Shah Alam. Part of the challenges that the cities in Malaysia are facing is the mainstream and fragmented institutional structure with which to administer the implementation of LCC programs. Local governments also face issues in applying green technology for LCC administration and management.

In Shah Alam, LCC projects and programs have been the responsibility of the city council's Planning Department (under the Sustainable Unit). They are being carried out through teamwork with other technical departments within the city council. This approach is seen as a haphazard institutional structure yet valued as an effective practice by the city council since the Planning Department has achieved tremendous records by addressing LCC initiatives through multiple programs and activities. MBSA introduced its first LCC Action Plan in 2017 as an approach based on sustainable development and carbon neutrality. However, in late 2020, the city council decided to enhance the action plan, beginning with a systematic review of that action plan to fit the current situation and the city council's new goal. This study was well timed as it corresponded to the National LCC Masterplan launched in the same year.

Based on the evaluation, MBSA learned that several strategies had not been not fully achieved. The Green Technology Council had not been established exclusively. Still, the role of the Sustainable Unit (under the Planning Department) was tightened and the Sustainable Meeting Committee was used as its new name. Initially, MBSA aimed to establish a specific LCC working committee. However, the projects were monitored by the departments responsible. Therefore, any meetings were initiated by the departments overseeing the projects. Because of that, the target to have four superior meetings according to the strategy outlined in the 2017 action plan was not met. In practice,

the monitoring was typically carried out through a fixed monitoring procedure but only for the Low Carbon City Framework calculation and based on the department's project, and the Sustainable Unit was not invited to these meetings. As such, some essential data or records were not captured by the Sustainable Unit. The review also exposed the importance of having a centralised database system for LCC projects, which the city council had fallen short of at that particular time. The first action plan also suggested the formulation of a comprehensive MBSA Green Technology Policy, but this had not yet been achieved in 2020. Other than that, several other shortages were determined, including the provision of incentives to developers who complied with green building requirements or recognition for GBI compliance.

Following the revision procedure, MBSA then developed a newly enhanced LCC Action plan, which framed a target of 45% absolute GHG emissions by 2035. The composition of the Shah Alam LCC Action Plan 2035 was an infusion of the many great ideas and expectations from the community, stakeholders, and city council staff. The strategies were improved and actions were comprehensively addressed. The new action plan design was consistent with the approach outlined in the National LCC Masterplan 2020. A major effort was made by the city council (led by the Sustainable Unit) in 2021 to systematically craft a document covering extensive actions and sub-actions for Shah Alam's LCC development. These actions included detailed programs with a specific timeline, particular collaborators, as well as the type of mitigation approaches. Strategies were classified into six (6) central cores of development: (1) Building, Water, and Clean Energy; (2) Urban Transportation and Mobility; (3) Solid Waste Management; (4) Urban Greening and Built Environment; (5) City Governance; and (6) Communication, Education and Public Awareness (CEPA). These essential key development subjects correlated with the key ideas for developing the national LCC. It can now be claimed that MBSA is a pioneering local government for having produces its LCC Action Plan in response to the National LCC Masterplan, which requires each city to formulate its climate change or LCC action plan. The Shah Alam LCC Action Plan 2035 was launched and published on the 21<sup>st</sup> of October 2021 and is now being sanctioned for implementation within Shah Alam's development. The city council believes it will become a powerful development tool for reducing carbon emissions in the city.

This study reveals that the role of urban governance is imperative in assisting the implementation of an LCC. The results from the FGD sessions demonstrate that the stakeholders highlighted how essential the role of a dedicated unit was in administering and managing LCC projects. The participants agreed that there should be a Champion to lead any LCC initiative. The Planning Department and the Sustainable Unit, which are directly involved in the LCC

plan for Shah Alam, were considered good entities for managing LCC projects. However, the participants claimed that the institutional framework could be further enhanced by considering the work plan and job descriptions extensively to alleviate the complexity of the roles and responsibilities. One participant stressed that the concept of a resilient city is very dynamic. Therefore, changes to an institutional framework are inevitable. Apart from that, every participant agreed that capacity building is the primary task when educating those involved in LCC projects and programs. They thought that changing mindsets and skills are the two (2) significant ingredients that would ensure the efficacy of LCC delivery. Urban governance plays a vital in conducting training, workshops, and benchmarking exercises.

Since the first LCC action plan in 2017, the city council has not demarcated any specific zones as low-carbon emissions areas. Still, it has designated many buildings in Shah Alam that should participate in the LCCF initiative. Building owners participate voluntarily by measuring the reductions in carbon from their activities and buildings. Nevertheless, the absence of low-carbon emission zones has not weakened the effort to promote a reduction in carbon emissions. The many city council activities and programs have facilitated these actions, including the provision of green elements and designs for city development. The FGD results featured several fundamental practices for MBSA that might improve the city's carbon-reduction performance, including creating standard guidelines for LCC development besides the existing planning guidelines for planning approval. Other essential features highlighted were the application of performance measurement for each LCC project through the assessment of Key Performance Indicators (KPI) and the need to practise continuous monitoring exercises for all LCC projects and programs. Figure 1 shows the Networking Mapping of the FGD results generated from the ATLAS.ti software.

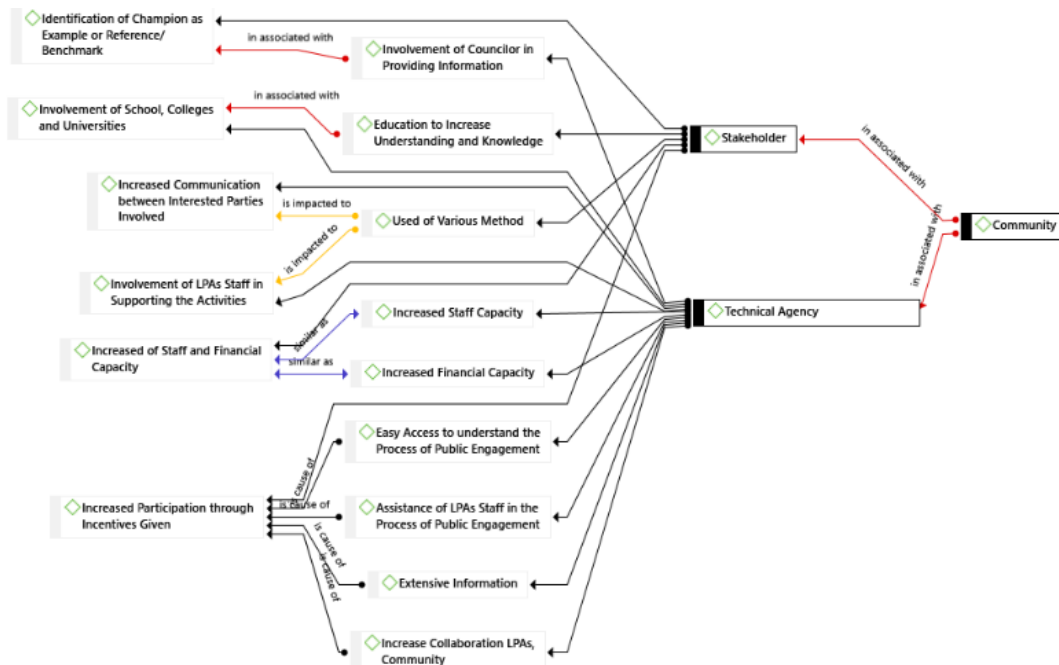


Figure 1: Network Mapping on Urban Governance for LCC Initiative from FGD.

Additionally, urban governance for the LCC initiative should allocate funding and consider green finance accordingly. The budget for LCC efforts should be revised periodically to ensure that projects and programs, capacity building, benchmarking, monitoring processes, and other related tasks that may improve performance can be strategically practised. Additionally, green procurement, which was also seen as a supportive measure by the participants, could encourage minimal adverse environmental effects. Another crucial aspect of urban governance for LCC is to incorporate working partnerships by having strategic partners for all projects and programs. All the FGD participants pointed out the need to engage with various parties and organisations, including the community of Shah Alam, since the consequences of LCC projects and programs affect the people and the environment. Including the community, stakeholders, and agencies would lead to the infusion of various ideas, skills, and expertise, as well as consider all aspects of the conditions and situation.

The study's findings provide critical perspectives on and interpretations of the roles and approaches involved in urban governance for LCC. The review of the related literature on LCC, examples of LCC action plans from other cities around the world, and the beliefs and inputs from the FGD were combined. They enabled the researchers to formulate an enhanced LCC Action Plan for the city

council. As mentioned earlier, the action plan put forward in October 2021 embedded the indicators into the strategies. The 2035 LCC Action Plan states its vision as "...a city that responds to climate change challenges and promotes LCC lifestyle to meet the global vision for sustainable agenda". The mission is "to effectively implement [the] LCC Framework to reduce carbon emissions in creating a better-quality living environment in Shah Alam".

The strategies encapsulate all the findings into six (6) strategic thrusts, including a city governance strategy, named *City Governance* in the document. The six (6) thrusts each have a specific *Game Plan*, resulting in 66 actions and 197 sub-actions. For City Governance (Urban Governance), the strategy was divided into two (2) Game Plans, namely, (1) the adaptation of Low Carbon City Principles in Policy and Guidelines and (2) Empowering Administration and Management. The objective is "to operate inclusive urban governance with emphasis on fostering low-carbon practice through multi-stakeholder governance, public participation and technology, and to provide efficient public services in forging LCC implementation".

The game plans for urban governance embrace all aspects of the indicators through 13 actions and 18 sub-actions. The actions for Game Plan 1 included developing inclusive LCC guidelines and a master plan for LCC zones in the city. Meanwhile, Game Plan 2 suggested measures like enhancing the institutional framework for LCC governance, human resource empowerment, interdepartmental coordination, strengthening partnerships with key players and stakeholders, identifying a Champion for LCC, creating an explicit database system for LCC, practising green procurement, a green financing system, diversifying the sources of funding and grants for LCC projects and programs, as well as practising continuous monitoring exercises. These actions are supported by many sub-actions, including periodic benchmarking, capacity building, and establishing work plans and KPIs for performance measurement. Through these arrangements, the researchers believe that the city council will improve its practice when implementing the LCC scheme.

## CONCLUSION

This paper draws attention to the great awareness of the significant role played by urban governance in administering and managing LCC interventions. The outcome reflects the fundamental approaches by urban governance to enhance the performance of the LCC projects and program delivery. The study revealed several substantive factors and strategies related to the institutional framework and urban governance needed to achieve LCC development, including the provision of a database system for LCC, specific guidelines for LCC development, an institutional framework (job description, work plan, and partnerships), funding, the practice of green finance, monitoring, benchmarking,

and many other integral elements. The results and findings from the study were thereafter applied when making the Shah Alam LCC Action Plan 2035, which saw the formulation of 13 actions and 18 sub-actions for urban governance. Each action addressed in the action plan accommodated the ideas of the FGD participants and the findings from the secondary data analysis. Future researchers could evaluate the effectiveness of low-carbon city zones or measure the performance of the working partnerships and collaborative efforts involved in LCC projects and programs. The researchers also feel that future researchers could evaluate the effects of LCC on the community.

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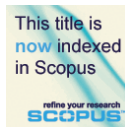
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## **TWELFTH MALAYSIA PLAN: PROSPECTIVE IMPACTS ON URBAN AND REGIONAL DEVELOPMENT**

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### **Abstract**

The Malaysia Plan is a five-year development plan that comprises policies and strategies to guide the government to achieve desired economic and socio-economic goals. The first Malaysia Plan started in 1966 following the inclusion of Sabah and Sarawak in 1963, followed by consecutive plans until the present 12th Malaysia Plan (RMK12, 2021–2025). The last ten years have shown a significant shift by the Malaysian government in emphasising the importance of urban and regional planning in shaping the national development policies and strategies. This paper analyses policies and strategic projects proposed in RMK12 that relate to urban and regional development and their likely impacts on the spatial development of the nation. The present study employs conventional content analysis as its main method. In addition, RMK12 policies and strategic projects are linked to the thrusts of Rancangan Fizikal Negara 4 (RFN4) and the principles of Dasar Perbandaran Negara 2 (DPN2). The findings demonstrated existing links between the policies and strategic projects of RMK12 and the thrusts of RFN4 and the principles of DPN2. Additionally, the spatial focus of RMK12 projects on the Klang Valley and Sabah and Sarawak indicates the government's commitment to leverage the economic potential of cities and the need to reduce regional development disparity between Peninsular Malaysia and Sabah and Sarawak. The findings will assist stakeholders in better understanding the implications and significance of the policies and strategic projects highlighted in RMK12 for Malaysian urban and regional development, and will thus drive the country toward achieving sustainable and inclusive development.

**Keywords:** RMK12, Strategic Projects, Urban Development, Rural Development, Malaysia

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## **INTRODUCTION**

In the Malaysian development system, the Malaysia Plan, or better known as Rancangan Malaysia (RMK), is the most important government document that outlines the national development policies and strategies for a five-year period. The five-year development document developed by the Economic Planning Unit under the Prime Minister's Department highlights the focus of the nation's economic and socio-economic development. The current plan is the 12th Malaysia Plan (RMK12), which runs from 2021 until 2025.

The strategies and aspirations contained in the Malaysia Plan are translated into the annual development budget unveiled by the Finance Minister in October every year. Regarding physical development, the Malaysia Plan is translated into the National Physical Plan, which is currently in its fourth edition (Rancangan Fizikal Negara—RFN4). However, the recently released RMK12 may not have been incorporated into the RFN4 because the RFN4 was developed prior to the introduction of the RMK12.

RMK12 has proposed some strategic projects in the development plan as the catalyst for sustainable and inclusive urban and regional development. The questions raised in this study are “What are the strategies and strategic projects being proposed that are related to urban and regional development?” and, most importantly, “What are the implications of these policies and projects for urban and regional development in Malaysia?”

This study examines the significance and implications of policies and strategic projects outlined in the RMK12 for urban and regional development in Malaysia, especially concerning documents related to physical and urban development, such as RFN4 and National Urbanisation Policies (Dasar Perbandaran Negara—DPN2). In addition, it links these policies and strategies to the government's aspirations of Wawasan Kemakmuran Bersama 2030 and the 2030 Agenda. Conventional content analysis is used to retrieve and analyse the qualitative data from the RMK12, which addresses both research questions.

## **METHODOLOGY OF THE STUDY**

The study employs conventional content analysis as the main method to examine the impact of RMK12's policies and strategic projects on the aspects of urban and regional development in Malaysia. Subjectively, this content analysis approach analyses and interprets the relationship between two concepts—policies and strategic projects and urban and regional planning (Hsieh & Shannon, 2005).

In this study, conventional content analysis is used to comprehend a phenomenon, which is the impact of policies and strategic projects on urban and regional development in Malaysia following the implementation of RMK12. This study adapted the content analysis approach underlined by Hsieh and Shannon (2005) by reading RMK12 several times to provide an understanding of the whole document. It is followed by each line of words being read using the skimming

and scanning technique (SST). SST is used to obtain key information and the primary idea of the reading material by searching the text for specific information (Sutz & Weverka, 2009).

In this study, the key information analysed is policies and strategic projects related to urban and regional planning and development. The projects are then mapped spatially. Key information is then highlighted and analysed, and prospective impacts of these projects on the spatial development of the nation are presented. This is done by linking the Priority Areas of the RMK12 with the Thrusts in RFN4 and the Principles of DPN2. The analyses are also linked to the *Wawasan Kemakmuran Bersama 2030* government aspirations and the 2030 Agenda as outlined in the RMK12.

## **MALAYSIAN NATIONAL PLANS AND RANCANGAN MALAYSIA KE-12**

A “development plan” is a document comprising policies and strategies prepared to help a government manage the available resources to achieve specific socio-economic goals within four to six years. Hence, it is not merely focused on the development of economic aspects but also on social, structural, and institutional aspects (Casey & Chew Ging, 2017). For Malaysia, the five-year development plan started with the Rancangan Malaya Pertama (1956–1960). With the inclusion of Sabah and Sarawak in 1963, Rancangan Malaysia Pertama (RMK1) was launched and covered the period of 1966–1970. Consecutive National Plans are rolled out every five years, with the current one being RMK12 (2021–2025). The Malaysian government has made a significant shift in shaping national development policies and strategies over the last ten (10) years, emphasising the importance of urban and regional planning as a driver for sustainable and inclusive development. It is translated into the Eleventh Malaysia Plan (2016–2020), where the policies outlined focus on strengthening the socio-economic well-being of the rakyat (people of the nation) through infrastructure, amenities, and public services. In addition, the inclusion of green growth as part of the key focus indicated the government’s agenda toward sustainable and resilient development. This direction is carried forward in the Mid-Term Review of the Eleventh Malaysia Plan following the review of the performance made by the government in 2016–2017. Even though progress has been made to improve the rakyat's quality of life and well-being, it is clear that a number of problems, such as affordable housing and the development gap between urban and rural areas and regions, still need to be resolved (Economic Planning Unit, 2018).

RMK12 commemorated the government's commitment to invest continuously in inclusive urban and regional development, thereby advancing balanced regional development and environmental sustainability. This corresponds with the new national vision, which focuses on the prosperity and

well-being of all citizens—Wawasan Kemakmuran Bersama 2030. Moreover, as a developing nation, the Malaysian government has consistently embraced a sustainable development agenda by incorporating the Sustainable Development Goals (SDGs) into the Malaysia Plan strategies in an effort to attain the 2030 Agenda (Economic Planning Unit, 2021).

**Table 1:** Focus of Malaysia Five-Year Plan since 2016

Plan	Period	Focus
Eleventh Malaysia Plan (RMK11)	2016–2020	Strengthening macroeconomic; Enhancing inclusiveness, well-being, human capital, and green growth; Strengthening infrastructure; Re-engineering economic growth; Transforming public services.
Mid-Term Review: Eleventh Malaysia Plan	2018–2020	Generating meaningful economic growth; Reforming governance and inclusive development; Balancing regional development, human capital, and green growth.
Twelfth Malaysia Plan (RMK12)	2021–2025	Resetting the economy; Strengthening security, well-being, and inclusivity; Advancing sustainability and future talents; Adopting technology; Enhancing connectivity; Strengthening public services.

As shown in **Table 1**, in addition to their main focus on economic policies, RMK11 and RMK12 focus on areas connected to urban and regional development that enhance economic growth and improve people’s livelihoods. In RMK11, the focus includes “enhancing inclusiveness and green growth, and strengthening infrastructure.” The mid-term review of the RMK11 included “inclusive development, balanced regional development, and green growth.” The current RMK12 focuses on “well-being and inclusivity, advancing sustainability as well as enhancing connectivity,” which augurs well for the urban and regional development of the nation.

## **MALAYSIA DEVELOPMENT PLAN AND URBAN AND REGIONAL DEVELOPMENT NEXUS**

As mentioned in the earlier section, the Malaysia Plan is essentially an economic development plan that guides the nation’s development every five years. Its main objectives are economic growth and stability, as well as the socio-economic

development of its people. Urban and regional development, meanwhile, is concerned with planning and regulating land use and spatial development, improving the quality of life, generating economic growth, and managing the environment to achieve sustainable development (UN-Habitat, 2016).

A few chapters in the RMK12 have proposed various policies and strategic projects that could have an impact on urban and regional development, as listed in **Table 2**. In Chapter 4: Enhancing Defence, Security, Well-being and Unity, RMK12 proposes affordable public housing to the tune of 2934 units on *waqf* land. Furthermore, user-friendly facilities for improved liveability are provided through the *Program Penyelenggaraan Perumahan* (PPP) and *Tabung Penyelenggaraan Perumahan Malaysia* (TPPM), involving 718 low-cost and medium-cost housing projects.

In Chapter 5: Addressing Poverty and Building an Inclusive Society, the Plan has listed four main areas, which include enhancing opportunities for home ownership by B40; elevating the standard of living of low-income Chinese and Indian households; optimising Malay reserve land and *waqf* instruments; and enhancing the development of the *Orang Asli* community. For home ownership, various housing programmes such as Rent-to-Own, *Rumah Mesra Rakyat*, and *Perumahan Penjawat Awam* will continue to be implemented. At the same time, basic infrastructure for Chinese new villages and better access to quality education for the Indian community will raise their standard of living. An integrated master plan for the development of *waqf* land and closer collaboration between federal and state agencies will lead to the optimal development of *waqf* land. On the other hand, the development of the *Orang Asli* community will be improved through land gazettelement for economic activities such as ecotourism and agritourism, as well as the construction of roads and the provision of utilities and telecommunication facilities.

Chapter 6, which is on Improving Regional Balance and Inclusion, has perhaps the greatest number of policies and strategic projects related to urban and regional development. In summary, they are as follows:

- i. **Accelerating Development Based on Key Growth Nodes and Hot Spot Areas:**  
Some of the projects mentioned are the strategic development of new townships in Penang and Negeri Sembilan. Other significant projects are the development of Malaysia Vision Valley 2.0 in Negeri Sembilan and the Pagoh Special Economic Zone in Johor. These projects will bring further economic activity to these areas. The extension of the Sarawak Corridor of Renewable Energy (SCORE) will accelerate growth in interior Sarawak.
- ii. **Improving Connectivity and Mobility to Boost Inter and Intra-regional**

Economic Activities:

Projects such as the West Coast Expressway and the proposed Labuan Menumbok bridge will improve transport networks and attract more economic activity.

- iii. **Strengthening Regional Planning:**  
State policies and plans such as the Smart Selangor Action Plan 2025, *Pelan Induk Terengganu Sejahtera* 2030 and Perlis Digital Plan 2021–2025 will be aligned to the national digital transformation objectives. In addition, state initiatives will be aligned with federal development policies.
- iv. **Enhancing cooperation under IMT-GT and BIMP-EAGA:**  
At least 30 catalytic projects which enhance local economic activities have been identified. A Green City Action Plan for an additional 14 urban centres will be implemented. A bridge connecting Rantau Panjang and Sungai Golok and the completion of more segments of the Pan Borneo Highway will enhance economic growth in rural areas.
- v. **Strengthening Urban Development Planning:**  
DPN2 and RFN4 will provide a comprehensive spatial planning framework. MURNINets will be expanded to all local authorities, while the Malaysia Smart City Framework will guide the Smart City agenda.
- vi. **Leveraging City Competitiveness to Attract Investment:**  
This strategy proposes Cyberjaya to be revitalised as a global technology hub and Bandar Malaysia to be developed as an international business hub.
- vii. **Optimising Land Use for Rural Economy:**  
Through technology adoption, training, and financial aid, FELDA's *Program Pembangunan Penderoka* will increase agricultural activities for settlers.

Development in Sabah and Sarawak is covered extensively in Chapter 7, specifically focusing on enhancing socio-economic development in both states. Regional development corridors, such as SEDIA in Sabah and SCORE in Sarawak, are leveraged to concentrate on niche areas such as oil, gas, and energy, manufacturing, and agriculture. In addition, development agencies are tasked with developing comprehensive development plans for interior areas of the states. These rural developments are supported through the enhancement of infrastructure and utilities. Infrastructure connectivity for stronger economic ties

is also a priority. This is done through road construction; upgrading existing amenities; and building the Integrated Customs, Immigration, and Quarantine (ICIQ) facilities.

Moreover, the focus is given to improving the competitiveness of major cities such as Kota Kinabalu and Kuching, thus maximising the potential of other towns to attract investments. In terms of affordable housing, 3202 low-cost houses under *Program Perumahan Rakyat* (PPR) in Sabah and Sarawak will be completed during the plan period. Besides, the development of Native Customary Land (NCR) land will also be accelerated.

Chapter 12, on the other hand, focuses on enhancing the efficiency of transport and logistic infrastructure and envisions the improvement of Transit Oriented Development, especially along the major public transport alignments such as Mass Rapid Transit 2 (MRT2) in the Klang Valley, Greater Johor Bahru, and East Coast Rail Link (ECRL).

**Figure 1** translates these strategic projects into a spatial plan. Based on the map, the two main regions that will receive the bulk of development during RMK12 are the Klang Valley and Sabah and Sarawak. The intensified development in the Klang Valley is perhaps due to its role as the central economic hub for the nation, taking advantage of the potential of a rapidly urbanising economy. The current economic development paradigm relies on cities as the engine of growth. Thus, it is only appropriate that such investments, especially by the private sector, will likely be concentrated in major cities, particularly those with strong international links.

Perhaps the focus on Sabah and Sarawak is a result of political leaders in both states requesting more development funds and project allocations. The two growth corridors, coupled with the ongoing construction of the Pan Borneo Highway, are the catalysts for a larger involvement of the region in the nation's urban and regional development. Construction of the new Indonesian capital in Kalimantan is another factor driving the economic growth in Sabah and Sarawak. Reducing the development gap between the two states and Peninsular Malaysia will allow an even distribution of growth in Malaysia.



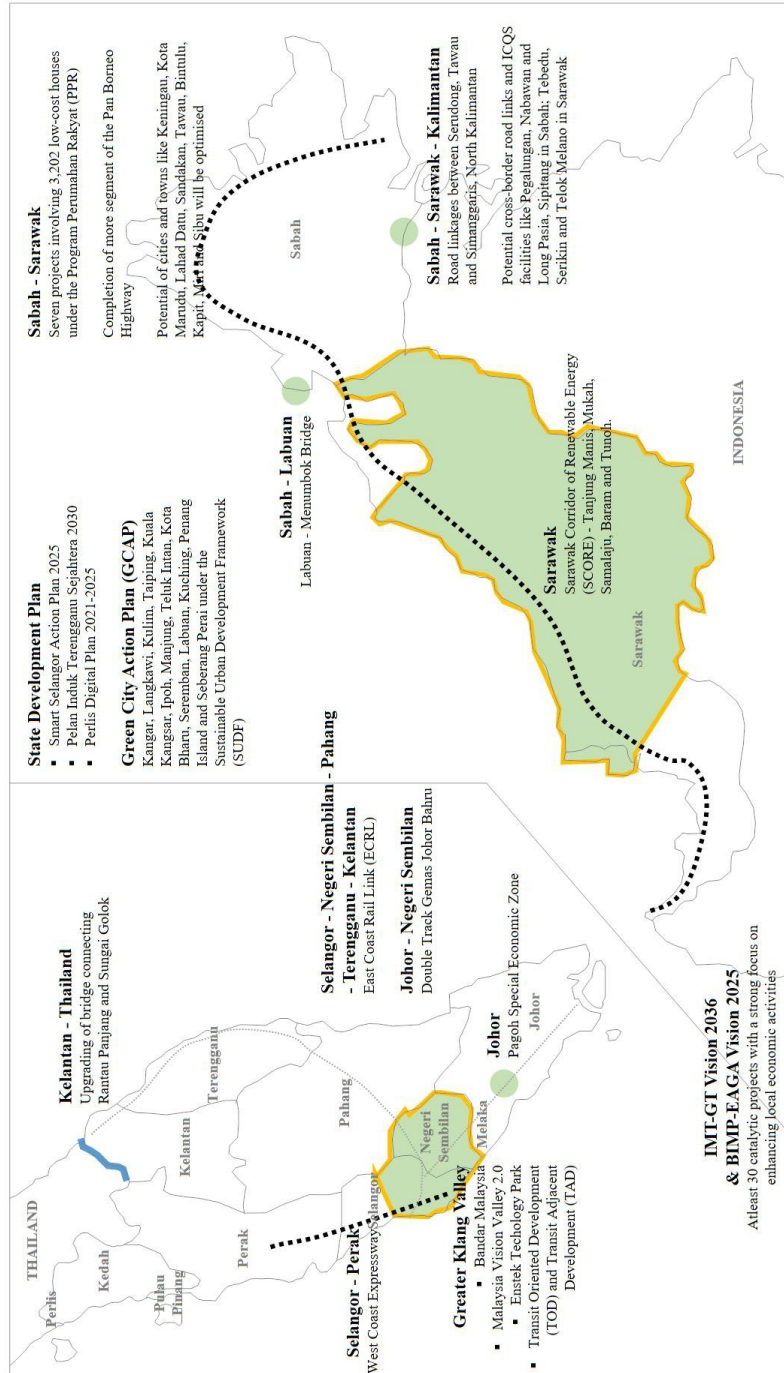


Figure 1 Urban and Regional Related Strategic Projects in Peninsular Malaysia, Sabah, and Sarawak

This section displays the linkages between the RMK12 as a development plan and two prominent spatial plans and policies that guide the Malaysian government on urban and regional development—RFN4 and DPN2. **Table 2** shows the priorities and strategies that focus on urban and regional development in these policies.

The table below demonstrates the pivotal role of urban and regional planning in driving national development to be more sustainable and inclusive. In correspondence with the RFN4 and DPN2, several priority areas under the RMK12 emphasise the aspect of urban and regional development. One of the priorities is to increase the supply of high-quality, affordable housing in all communities. This corresponds to several strategies highlighted in the RFN4 and DPN2, such as "housing provision planning for all" and "provision of adequate, high-quality, comprehensive, and affordable housing for society."

The other priorities highlighted in the RMK12 are to ensure the economic potential of key nodes like Malaysia Vision Valley (MVV 2.0) and Pagoh Special Economic Zone, as well as the states of Sabah and Sarawak, which are to be optimised. RFN4 and DPN2 key strategies, such as "Strengthening the nation's strategic position at the global level," "Sustainable and competitive economic growth," and "Optimal use of *waqf* land, Malay reserve land, and customary land," appear to complement the RMK12 priorities.

Apart from the regional level, local development in urban and rural areas is also crucial to national development. From the RMK12, it is apparent that priority will be given to improving urban planning and governance and upgrading the infrastructure and basic amenities in rural areas. It is to ensure that urban development is more sustainable and resilient and, at the same time, to close the gap between urban and rural areas. These priorities are in line with the strategies that are emphasised in RFN4 and DPN2. Both of these policies address the issues of balanced and dynamic growth, as well as the sustainability and liveability of space.

Furthermore, RMK12 emphasises the importance of infrastructure and connectivity for improving the *rakyat*'s socio-economic development, especially in Sabah and Sarawak's rural areas. The intensification of infrastructure contributes to improving access to social services, thereby enhancing the liveability of the *rakyat*. Likewise, RFN4 and DPN2 emphasise several strategies that focus on the importance of infrastructure, such as "Improving digital and smart infrastructure," "Community-friendly planning and development," and "Integrated and efficient infrastructure services, utilities and municipal facilities."

Another urban and regional development-related priority underlined in RMK12 is to ensure integrated, affordable, and reliable people's mobility via public transportation. It aligns with the strategies stated in both RFN4 and DPN2, including "Strategic and integrated transportation network connectivity" and "Empowerment of comprehensive, sustainable, integrated, efficient, and affordable public transportation systems" to provide a sustainable and inclusive living environment for the community.

Table 2 Twelfth Malaysia Plan and National Policies on Urban and Regional Development Linkages

RMK12	RFN4	DPN2
<p>Chapter 4: Enhancing Defence, Security, Well-being and Unity</p> <p><b>Priority Area C: Increasing the Supply of Quality Affordable Housing</b></p> <p>Focus will be given to improving access to affordable housing by enhancing affordable housing governance and ensuring inclusive housing development.</p>	<p><b>Thrust 3 Liveable Environment and Inclusive Community</b></p> <p>KI 1: Housing Provision Planning for All</p> <p>KI 3: Conducive and Liveable Environment</p>	<p><b>Principle 1: Good Urban Governance</b></p> <p>Objective 3: Application of Accountability and Integrity Values in Development Planning</p> <p><b>Principle 2: Liveability City</b></p> <p>Objective 1: Provision of Adequate, Quality, and Comprehensive Affordable Homes for all Society</p> <p><b>Principle 3: A Competitive Urban Economy</b></p> <p>Objective 4: Optimal Use of <i>Wagf</i> Land, Malay Reserve Land, and Customary Land in Urban areas</p>
<p>Chapter 6: Improving Regional Balance and Inclusion</p> <p><b>Priority Area A: Optimising Regional Economic Potential</b></p> <p>Initiatives will focus on accelerating development based on key growth nodes and hotspot areas; attracting quality investment; improving the business ecosystem; enhancing strategic collaboration and coordination; and enhancing cooperation under IMT-GT and BIMF-EAGA.</p>	<p><b>Thrust 1: Balanced and Dynamic Growth</b></p> <p>PD 1: Strengthening the Nation's Strategic Position at a Global Level</p> <p>PD 2: Sustainable and Competitive Economic Growth</p>	<p><b>Principle 1: Good Urban Governance</b></p> <p>Objective 6: Strengthening Communication and Integrated Cooperation among all Government Agencies, Authorities, and Statutory Bodies</p>
<p>Chapter 6: Improving Regional Balance and Inclusion</p> <p><b>Priority Area B: Developing Sustainable Cities</b></p> <p>Priority will be given to promoting effective urban planning and governance; fostering a sustainable urban economy; prioritising green and resilient urban development; and developing a sustainable urban society.</p>	<p><b>Thrust 2: Spatial Sustainability and Climate Change Resilience</b></p> <p>KD 1: Holistic Land Use Planning</p> <p>KD 3: Development Towards a Carbon Neutral Nation</p> <p><b>Thrust 3: Liveable Environment and Inclusive Community</b></p> <p>KI 3: Conducive and Liveable Environment</p> <p>KI 4: Community-Friendly Planning and Development</p>	<p><b>Principle 1: Good Urban Governance</b></p> <p>Objective 2: Determination of City Boundaries</p> <p>Objective 7: Implementation of LA21 Programme and Effective Sustainable Initiatives</p> <p><b>Principle 2: Liveability City</b></p> <p>Objective 5: Implementation of Safe Urban Design</p> <p>Objective 9: A Safe Urban Environment</p> <p><b>Principle 3: A Competitive Urban Economy</b></p> <p>Objective 1: Increased Competitiveness and Urban Economic Density</p> <p>Objective 4: Optimal Use of <i>Wagf</i> Land, Malay Reserve Land, and Customary Land in Urban areas</p> <p>Objective 6: Optimise Use of Brownfield Areas</p>

**Principle 5: Green Development and Clean Environment**

- Objective 1: Application of Green Elements in Urban Development
- Objective 2: More Efficient and Sustainable Use of Energy
- Objective 3: Improving the Quality of Healthy Lifestyles and Clean Air in the city
- Objective 5: Increasing the Size, Quality, and Number of Open Spaces
- Objective 6: Increasing the Size and Quality of Green Areas
- Objective 7: Effective Solid Waste Management

**Chapter 6: Improving Regional Balance and Inclusion**

**Priority Area C: Transforming Rural Areas to Bridge Development Gap**

Rural areas will be further developed to narrow the development gap between rural and urban areas. This will be done by upgrading infrastructure and basic amenities, providing better connectivity, and expanding socio-economic activities.

**Thrust 1: Balanced and Dynamic Growth**

- PD 3: Strategic and Integrated Transportation Network Connectivity
- PD 4: Improving Digital and Smart Infrastructure

**Principle 3: A Competitive Urban Economy**

- Objective 4: Optimal Use of *Waqf* Land, Malay Reserve Land, and Customary Land in Urban areas
- Objective 5: Integration of Village Development Urban Planning

**Chapter 7: Enhancing Socio-economic Development in Sabah and Sarawak**

**Priority Area A: Solidifying Provision of Infrastructure**

The provision of infrastructure and connectivity will be solidified to facilitate economic activities and enable better delivery of social services, particularly in the rural areas.

**Thrust 1: Balanced and Dynamic Growth**

- PD 3: Strategic and Integrated Transportation Network Connectivity
- PD 4: Improving Digital and Smart Infrastructure

**Principle 1: Good Urban Governance**

- Objective 5: Community Involvement in Development Programmes and Projects
- Objective 6: Strengthening Communication and Integrated Cooperation among all Government Agencies, Authorities, and Statutory Bodies

**Principle 2: Liveability City**  
 Objective 3: Empowerment of Comprehensive, Sustainable, Integrated, Efficient, and Affordable Public Transportation System  
 Objective 4: Integrated and Efficient Infrastructure Services, Utilities, and Municipal Facilities

**Principle 3: A Competitive Urban Economy**  
 Objective 3: Provision of an Efficient and Effective Communication System

**Principle 1: Good Urban Governance**  
 Objective 6: Strengthening Communication and Integrated Cooperation among all Government Agencies, Authorities, and Statutory Bodies

**Principle 3: A Competitive Urban Economy**  
 Objective 1: Increased Competitiveness and Urban Economic Density  
 Objective 4: Optimal Use of *Wag* Land, Malay Reserve Land, and Customary Land in Urban areas  
 Objective 6: Optimise Use of Brownfield Areas

**Principle 4: Inclusive and Equitable Urban Development**  
 Objective 3: Bumiputera Involvement in Economic Development

**Thrust 3: Liveable Environment and Inclusive Community**  
 KI 3: Conducive and Liveable Environment  
 KI 4: Community-Friendly Planning and Development

**Chapter 7: Enhancing Socio-economic Development in Sabah and Sarawak**  
**Priority Area B: Optimising Economic Potential**  
 Sabah and Sarawak are strategically located close to a majority of ASEAN countries. Leveraging on this, measures will be taken to provide a conducive ecosystem for economic growth.

**Chapter 7: Enhancing Socio-economic Development in Sabah and Sarawak**  
**Priority Area C Improving Access to Social Services**  
 Efforts will concentrate on improving access to education, healthcare services, and housing, as well as enhancing security and public safety.

**Thrust 1: Balanced and Dynamic Growth**  
 PD 1: Strengthening Nation's Strategic Position at Global Level  
 PD 2: Sustainable and Competitive Economic Growth

**Thrust 2: Spatial Sustainability and Climate Change Resilience**  
 KD 1: Holistic Land Use Planning

**Principle 1: Good Urban Governance**  
 Objective 5: Community Involvement in Development Programmes and Projects  
 Objective 7: Implementation of LA21 Programme and Effective Sustainable Initiatives

<p><b>Principle 2: Liveability City</b>                  Objective 1: Provision of Adequate, Quality, and Comprehensive Affordable Homes for all Society                  Objective 4: Integrated and Efficient Infrastructure Services, Utilities, and Municipal Facilities                  Objective 5: Implementation of Safe Urban Design                  Objective 7: Comprehensive Access to Quality Health Facilities                  Objective 9: A Safe Urban Environment                  Objective 10: Comprehensive Disaster Risk Management</p> <p><b>Principle 4: Inclusive and Equitable Urban Development</b>                  Objective 1: Programme Focus on B40 Household Welfare                  Objective 4: Increasing the Ability of Youth to Contribute and Receive Urban Development Benefits                  Objective 5: Provision of the Needs of the Elderly and Disabled within Diverse Urban Development</p> <p><b>Thrust 3: Liveable Environment and Inclusive Community</b>                  KI 1: Housing Provision Planning for All                  KI 2: Building Educated and Competitive Society</p>	<p><b>Thrust 1: Balanced and Dynamic Growth</b>                  PD 3: Strategic and Integrated Transportation Network Connectivity</p> <p><b>Thrust 2: Spatial Sustainability and Climate Change Resilience</b>                  KD 1: Holistic Land Use Planning</p> <p><b>Thrust 3: Liveable Environment and Inclusive Community</b>                  KI 3: Conducive and Liveable Environment                  KI 4: Community-Friendly Planning and Development</p> <p><b>Principle 1: Good Urban Governance</b>                  Objective 5: Community Involvement in Development Programmes and Projects</p> <p><b>Principle 2: Liveability City</b>                  Objective 3: Empowerment of Comprehensive, Sustainable, Integrated, Efficient, and Affordable Public Transportation System                  Objective 6: Improved Healthy and Low-Carbon Lifestyles</p>
<p><b>Chapter 12: Enhancing Efficiency of Transport and Logistics Infrastructure</b>  <b>Priority Area A: Ensuring Integrated, Affordable, Reliable and Seamless People Mobility</b>                  Measures will be taken to ensure integrated, affordable, reliable, and seamless human mobility, including overall accessibility to public transport and a behavioural shift from private to public transport.</p>	

## **CONCLUSION**

This paper contributes to the continuant discussion on the impact of the policies and strategic projects of RMK12 on the aspects of urban and rural development of the nation, especially for Malaysia, towards achieving the aspiration of Wawasan Kemakmuran Bersama 2030 and the 2030 Agenda. Therefore, this study investigates the significance and implications of policies and strategic projects proposed in the RMK12 for Malaysian urban and regional development by focusing on the RFN4 and DPN2 documents.

Using conventional content analysis, the study hopes to gain a better understanding of the impact of RMK12's policies and strategic projects on aspects of Malaysian urban and regional development. Through this process, the key information gathered is analysed and linked with the Thrusts of RFN4 and the Principles of DPN2 and mapped spatially.

The content analysis provided earlier has demonstrated that there is a close relationship between RMK12 and urban and regional development in Malaysia as depicted in RFN4 and DPN2. It is apparent that several of RMK12's priorities do focus on urban and regional development. One of the priorities is to provide more quality, affordable housing for all segments of the community.

Furthermore, the government's initiative to maximise the economic potential of important growth nodes in Peninsular Malaysia, Sabah, and Sarawak conforms to the objectives of RFN4 and DPN2 in terms of decreasing regional imbalance. More infrastructure and basic amenities projects proposed in RMK12 will help the government realise its goal of achieving sustainable and equitable development in urban and rural regions, primarily in Sabah and Sarawak.

The other urban and regional development-related priority underlined in RMK12 is to enhance public access to integrated, affordable, and reliable public transportation. This is in line with the strategies in RFN4 and DPN2.

The findings of the study are expected to assist policymakers and decision-makers, as well as other stakeholders, in better understanding the implications and importance of the policies and strategic projects highlighted in RMK12 for Malaysia's urban and regional development, thereby propelling the country toward sustainable and inclusive development. In future empirical research, numerous topics can be examined, such as the progress and effects of strategic projects on the goal of sustainable and equitable development.

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## **WORKING-FROM-HOME (WFH) PRACTICE FOR URBAN POOR RESPONDING TO PANDEMIC SITUATION**

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### **Abstract**

The situation where one can practise working from home is not easy for some people in Malaysia, especially those with limited space at home. Working from home (WFH), on the other hand, needs to be rethought and thoroughly examined for individuals in the bottom 40 percent (B40) for a variety of reasons. A total of 144 samples from low-income households in Shah Alam responded to the structured questionnaire. The questionnaire focuses on two main investigations: (1) the WFH conditions in terms of space and environment among the B40; and (2) how they manage WFH distractions in connection to the house space and environment. According to survey results, most respondents prefer working in a bedroom or living room since it is a more pleasant environment. The availability of electrical plugs, internet access, and adequate ventilation are further considerations that influence their choice of workspace. The survey's findings indicated that the lack of a comfortable workspace made the majority of respondents unhappy about practising WFH. The majority of responders suggested that future bedrooms be larger to guarantee that those practising WFH are comfortable. The results of this study are expected to enhance the planning and design of residential living space and pave the way for future low-cost housing development that places greater emphasis on the well-being of the urban poor.

**Keywords:** work from home, WFH workspace design, B40, covid-19, quality of life

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## **INTRODUCTION**

Through the Prime Minister's announcement on 18<sup>th</sup> March 2020, the Malaysian government officially declared the Movement Control Order (MCO) under the Prevention and Control of Infectious Diseases Act 1988 and the Police Act 1967. The Movement Control Order (MCO) was imposed due to COVID-19, creating an unprecedented situation in which a third of Malaysians in the private sector were required to work from home (UNDP, 2020). This situation provided a once-in-a-lifetime opportunity to assess attitudes toward working from home (WFH), as well as the trade-offs between WFH conditions and life and environmental outcomes. Based on the survey conducted by UNDP among employees during the MCO, it was found that WFH had largely been beneficial for work-life integration and productivity when time-saving could increase productivity in terms of work and domestic responsibilities. More respondents reported an increase in their quality of life rather than a decrease, even for those who found domestic responsibilities slightly more difficult, or who put in extra time while working from home.

However, the B40 group, particularly in the informal economy, is offered little or no labour protection, and often has a lower ability to work remotely. Recent survey findings indicate that only one in four self-employed individuals has been able to WFH during the MCO. The International Labour Organisation (ILO) has also identified informal economy workers as the most vulnerable to business closures due to the pandemic, with workers in this sector experiencing an estimated 60% decline in income globally. Since most studies focus on the impact of WFH in the context of economic, social, and employer-employee relationships, there is still inadequate research pertaining to the impact of WFH on housing design, planning, home space planning, and ICT infrastructure, particularly among low-income earners.

### **Low-Income Households and Low-Cost Housing in Shah Alam**

According to the Department of Statistics Malaysia (DOSM), household income can be defined as the total income received by each member of one household unit (Romeli, 2021). In Malaysia, low-income earners are classified as the Bottom 40% (B40), consisting of a societal group with a monthly household income of RM4,850 or less. According to Bank Negara Malaysia (BNM), to live comfortably in Malaysia, the estimated cost of living in a large city such as Kuala Lumpur ranges from RM2,700 to RM6,500 (Eilyn Chong and Farina Adam Khong, 2018). An unmarried individual needs to earn at least RM2,700 per month, a couple without children must earn about RM4,500, and a couple with two children should earn at least RM6,500 to live comfortably in Malaysia.

Nowadays, the availability of inexpensive housing is one of the pressing concerns that developing countries face the most due to increased urbanisation and population growth. The need for housing has become a major concern for a lot of individuals, with having a home as one of their top priorities (Wan Mohamad et al., 2018). Without a place of residence, people feel unprotected from various dangers or other environmental factors. Housing fulfils both psychological and physical needs by providing a sense of privacy and personal space, as well as protection from the elements. In other words, low-cost dwelling designs in Malaysia have changed over time from two to three bedrooms. Additionally, extra space can be used as a dining room, a separate toilet and bathroom, or a place to dry laundry (Construction Industrial Development Board/CIDB, 1998; Wan Mohamad et al., 2018).

To promote social well-being for all communities and ensure sustainable and comfortable communal living spaces, infrastructure and social facilities must be provided. The PKNS Flat, a low-cost housing development in Shah Alam, has proven to be of some success. There are about 3530 units of 5-story walk-up flats with a built-up size of 650 square feet in low-cost house developments. This project was completed in 2000. There are three bedrooms, living rooms, a kitchen, a washing or drying area, and a bathroom with specific dimensions and materials used in low-cost house developments. There are also other facilities provided to the communities, such as primary and secondary schools, community halls, commercial areas, shop lots, bus stops, car and motorcycle parking areas, and others.

According to Wan Mohamad et al. (2018), Malaysian low-cost housing must have a built-up size of 550 to 660 square feet, consisting of two bedrooms, a living room, a kitchen, and a bathroom. Past research has been conducted in this field. A normal Malaysian family typically consists of three children and two adults, for a total of five people. Accordingly, each room or space would accommodate two to six people. This situation may contribute to inconvenience and privacy issues for families with more than four members. In a previous study on spatial behaviour in low-cost housing, two primary types of coping behaviour were identified: adaptation to the available space and adjustment toward the space (Indriyati, S.A, 2013). The results show that a large number of households were able to adapt to their surroundings by making physical and functional changes to their homes.

### **The New Norm of Working from Home (WFH) Practice as the Current Situation**

Over the last three decades, researchers have analysed working from home and its consequences in various disciplines like business and economics, environmental sciences, and psychology (e.g., Bailyn, 1988; Henderson, Koenig, and Mokhtarian, 1996; Gajendran and Harrison, 2007). According to the

literature, working from home is characterised by two main aspects. First, employees work outside the common workplace. Second, a connection between home and office exists. Information exchange and communication with colleagues are possible using information and communication technologies (Bélanger, 1999; Bailey and Kurland, 2002). Moreover, the literature states that employees need to have a suitable job design for working from home. Home-based work is mostly suitable for employees who mainly engage in knowledge-based tasks, have limited face-to-face contact, and possess a high degree of autonomy (Bailey and Kurland, 2002).

Furthermore, WFH is a new modern norm that requires a stable connection to the internet, enables mobility, and allows individuals an easy way to complete work. Working from home can also be defined as working remotely or telecommuting. This enhances employees' ability to complete their tasks from a different location, in contrast to a normal office environment. They will use telecommunication tools such as phones, the internet, e-mails, and video apps for meetings and task delegations. Besides, telecommuting can also be considered a flexible occupational option that allows employees to work in remote locations using modern telecommunications technologies (Fougere K.T. and Behling R.P., 2016).

#### **Advantages and Disadvantages of Employees' Practising WFH During the Pandemic**

Findings from a survey by Fougere and Behling (2016) discovered that about 64 percent of respondents believed that telecommuting can increase the productivity of work responsibilities, while 87 percent of them thought that it could reduce stress among employees, and about 70 percent assumed that telecommuting can lead to greater job satisfaction or a well-managed workload. From another point of view, employees may have a more flexible work schedule by telecommuting since they can work at their own pace without any pressure or other normal distractions common in the workplace. Additionally, employees who need to travel for work will save money on transportation and can increase time consumption for working, which will lead to better productivity during working hours. Companies can also reduce costs in terms of energy bills and other regular office maintenance.

While enjoying the benefits of working from home, there are also some challenges and disadvantages to this new working lifestyle. The practice of working from home has beneficial effects for both parties, i.e., employers and employees (Vyas & Butakhieo, 2020). Some people who have a stable internet connection and a work space at home prefer to work at their own pace and at their own pace (Grant et al., 2019; Purwanto et al., 2020). Those who have problems accessing certain connections, however, would like to go to the workplace and

operate in a typical space with current amenities. Employers support certain expectations when working from home, such as the cost of facilities associated with WFH, training in the use of technology, and organisational communication, among others. Employees' well-being and IT support from the organisation are examples of other types of support for the WFH arrangement (Baker, Avery, and Crawford, 2007; Vyas & Butakhieo, 2020). Some employees will have more personal and social interaction with their co-workers and managers in obtaining clarification, while others may encounter difficulties in terms of connectivity to the internet and mobile connection and need to pay more for that. Other than that, employees, either those with families or those who are single, may have a high tendency to experience more distractions at home compared to working in office environments. Examples include disturbances from children and/or other family members, noise problems, cell phone issues, and others, which are beyond the employers' power to control. Employees will also tend to use their working time for personal matters. According to previous studies, working from home is influenced not only by the organisation but also by the individual employee and other family factors (Baker, Avery, and Crawford, 2007; Solõs, 2016; Vyas & Butakhieo, 2020). Besides, for someone who works in a security department, some issues may arise in terms of data transfers, especially pertaining to the company's confidential data or information. There is a possibility of data theft or data leaks to third parties. Not all types of work can be conducted outside of office environments. Some departments need high accessibility to folders and data from the office, and mistakes can occur if there is miscommunication among employees. According to a Nextthink poll, 38% of employees had problems with VPN access to vital applications. At the same time, 37% of employees had issues with their Wi-Fi connection, while 35% of employees had issues using video conferencing apps (Periasamy Nathan et al., 2021).

Working from home is not easy to manage. There are distractions and impacts from several different perspectives during WFH. These distractions and impacts are not only encountered by low-income employees but also by those who have adequate facilities to accommodate them. According to Sloan (2017), distractions occur when people need to work from home, which can affect employees' work productivity and opinions on how to handle such problems. According to recent research (Vyas & Butakhieo, 2020), many individuals had been under the notion that WFH was an eccentric idea before the pandemic and was considered impractical in densely crowded places.

Sometimes, hearing excessive noise can reduce concentration, which may become almost impossible at times. This is likely to be experienced by people with limited working spaces who need to focus on completing their tasks (Sloan, 2017; Vyas & Butakhieo, 2020). Noise can come from family members or even from music that one listens to. In addition, individuals who are required

to work from home will be subjected to noise coming from home appliances such as the dishwasher, the washing machine, and the vacuum cleaner, as well as other family members' activities. Individuals who must work from home should, therefore, plan for permanent office equipment such as a computer, printer, and filing system in their own space (Montag & Walla, 2016). Those who stay with other family members are compelled to be partly responsible for helping out with household chores. A working mother will be distracted by an overflow of dirty dishes in the sink and a mountain of laundry that requires folding. Therefore, people who practise WFH need to have their own working space to focus and concentrate on completing tasks. Setting a schedule to complete tasks is an important priority.

## **RESEARCH METHODOLOGY**

This study intends to examine the quality of life of the B40 group in connection to the design and surroundings of their living spaces or residences during WFH. The purpose of this study is to assess the impact of COVID-19 on low-income residents of high-rise and landed residential units who need to work from home. This study employs the case study technique by selecting the poor urban residents of Shah Alam as its subject. This study explores the hypothesis that the architecture of residential units affects the quality of life of the urban poor who practise WFH following the implementation of government restrictions during a pandemic.

The PKNS Flat, a low-cost housing unit in Section 7, Shah Alam, was selected as the distribution area for the study's questionnaires. The questionnaires were distributed to residents who reside in the PKNS Flat in Shah Alam. A sample of 144 respondents from low-income households in the selected study area provided their responses to the structured questionnaire. The questionnaire focuses on two main areas of inquiry: 1) WFH conditions in terms of space and environment for the B40 group, and 2) how distractions were handled during WFH in terms of space and environment.

A total of 144 respondents were selected for this survey using the stratified random sampling method to represent the low-income households of the PKNS Flat in Shah Alam. The selection of the sample was calculated based on the total units of the PKNS Flat, which amounted to 3530 units, with a 95% degree of confidence and an error margin of 8%. Distribution of the questionnaire was made house to house as well as by approaching respondents at parking and recreation/open space areas. However, some residents declined to answer the questionnaire due to time constraints. The questionnaire is somewhat detailed, requiring about 10–15 minutes to complete.

## FINDINGS

This study analyses the design, space requirements, and size of the room or unit used by low-income employees while working from home. It is important to know their requirements for the future home-workspace design. Based on the observation of the low-cost units in the study area, each unit with a built-up size of 650 square feet has three bedrooms, a living room, a kitchen, a washing or drying area, and a bathroom with specific dimensions and materials used in low-cost house developments. Approximately 44.3% of the respondents reside in rented units, while about 55.7% reside in their own properties. About 27.3% of the respondents reside with their parents, while 42.3% live in units with three to four other people. A little over 35.5% of respondents reported living in a unit with more than five people. Following 3–4 people in a unit, this data shows a higher second. Wan Mohamad et al. (2018) discovered that the typical Malaysian family consists of three children and two adults, for a total of five people. This study's findings are similar to those of that study.

**Table 1:** The number of residents in each unit

Number of residents in a unit	Percentage (%)	Total
Alone in a unit	2.7	4
2 people in a unit	9.8	14
3 to 4 people in a unit	42.3	61
More than 5 people in a unit	35.5	51
Alone (renting a room in a unit)	9.7	14
Total	100	144

According to previous studies, working from home is influenced not only by the organisation but also by individual and family factors (Baker, Avery, and Crawford, 2007; Solōs, 2016; Vyas & Butakhieo, 2020). According to data acquired from the questionnaire survey, respondents who reside with 3–5 individuals in a unit expressed dissatisfaction with their ability to practise WFH (37.3% & 58.1%) due to the lack of an appropriate workspace. The number of people residing in a unit corresponds to the unit's size. Thus, families with more than 3–5 people in a unit experience “distractions from family members” while engaging in WFH. They also took into account the fact that they have to work alongside those with whom they are living. The chi-square test results in Table 2 indicate a value of 27.306 and a significance level of 0.05,  $p = 0.001$ . This result indicates that the number of people in a unit is associated with WFH issues or the

general ability to practise WFH. Thus, the size of respondents' living areas influences the problems they confront during WFH.

Additionally, there are certain problems with data transfer and confidential company information for someone who works in the security department. Internet access is a critical factor to take into account when working away from the office (Periasamy Nathan et al., 2021), particularly if they have to share internet access with their families.

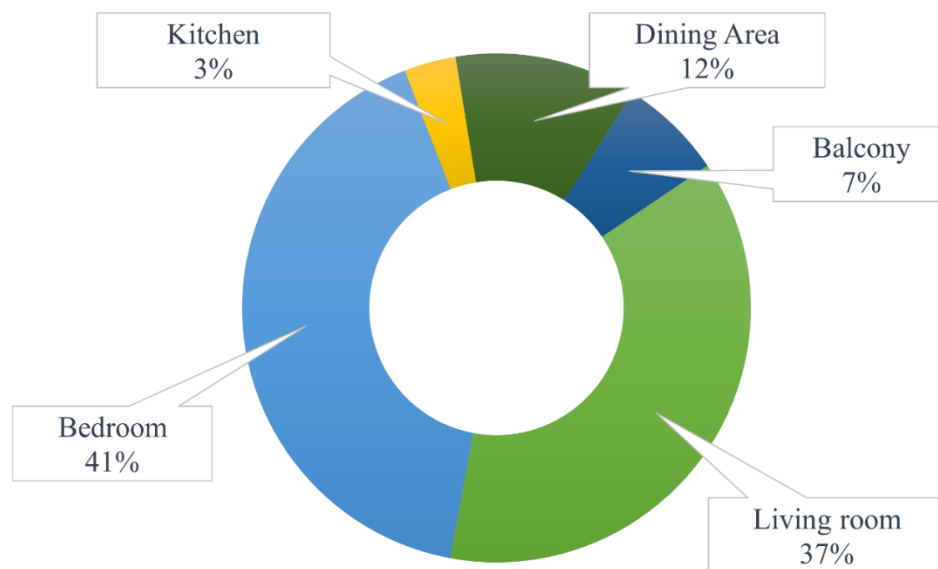
**Table 2.0:** The number of residents in a unit versus the issues encountered by respondents working from home

Issues encountered by respondents during WFH	The number of residents in a unit				
	Alone in a unit	2 people in a unit	3 to 4 people in a unit	More than 5 people in a unit	Alone (renting a room in a unit)
Uncomfortable workspace	0	0	37.3	58.1	4.6
Limited access to resources such as office documents	5.3	15.7	28.9	36.9	13.2
Unstable internet access	5.4	13.5	27	45.9	8.1
Distraction from a family member	0	0	33.3	46.7	20
Others	0	27.3	27.3	36.4	9

Chi-square = 27.306; Significance = 0.001



### Work Space chosen by the respondent during WFH



**Figure 2:** Work Space chosen by the respondents during WFH

Most respondents, according to the data collection, prefer to work in their bedrooms, and about 41% of them will remain in their bedrooms throughout the working day. According to the literature review, working in a room can be one of the best options to keep family members away from distractions. Additionally, it can reduce any background noise that may impair focus during work. An employee must ensure a peaceful setting and be able to make a fair judgement that is not influenced by any emotional issues in order to help the office management complete their responsibilities. In addition, working in a room can impede someone else from doing other household chores like washing the dishes or clothes, among other things. Likewise, the living room was chosen as the workplace location by 31% of the respondents. Dining 13%, balcony 7%, and kitchen 3% are other areas that have also been used as workspaces for office work. Table 3 shows the reasons these areas were chosen to complete daily duties during WFH.

**Table 3:** Reasons for choosing WFH space according to the number of residents in a unit

Reasons for choosing WFH space	Number of persons in a unit (%)				
	Alone in a unit	2 people in a unit	3 to 4 people in a unit	More than 5 people in a unit	Alone (renting a room in a unit)
Close to electrical outlets	0	21.2	26.3	36.8	15.7
Good ventilation	3.7	7.4	22.2	55.5	11.1
Comfortable space	5.7	16.6	11.1	44.4	22.2
Good internet access	4.2	12.5	29.2	50	4.1
Far from family members' disturbances	0	0	41.5	51.7	6.8
Considering other family members' movements in the house	0	0	64.3	28.5	7.2
Easy to eat and cook	0	16.6	33.4	50	0
Away from the distractions of children	0	0	42.8	57.2	0

Chi-square =504.411; Significance = 0.001

WFH is difficult for people who have a large family in a small unit. To learn more about their experiences and challenges, respondents were chosen to participate in telephone interviews. According to the feedback, they occasionally needed to switch their workspace to keep everyone satisfied and make it conducive to spending time with other WFH family members. For them, managing stress and diversions is a major struggle.

Crosstabulation analysis in Table 3 explains that the majority of respondents with families larger than three to five members chose their space for WFH with the consideration of “far from family members’ disturbances,” “considering other family members’ movements in the house,” and “away from the distractions of children”. The Chi Square analysis indicated a Chi Square value of 504.411, which is significant at a 0.05 level ( $p = 0.001$ ). The number of individuals in a unit and the reason for selecting WFH space were found to be significantly correlated. This suggests that the number of individuals in a unit is taken into account when deciding where to conduct WFH.

**Table 4:** Space to Reduce Stress While Working from Home

Space to reduce stress while WFH	Percentage (%)	Total
Bedroom	29.1	42
Television room/audio room	27.7	40
Living room	19.4	28
Kitchen	14.5	21
Balcony	9.3	13
<b>Total</b>	<b>100</b>	<b>144</b>

Table 4 shows that the majority of respondents each have a different method for managing stress when working from home during the pandemic. People are not permitted to leave the house during this time unless in cases of emergency. As a result, while under stress, people often find it difficult to focus on their work during the workday. The survey's findings indicate that the majority (29.1%) of respondents would stay in their bedrooms to manage their stress. Around 27.7% chose to relax by watching television and listening to music in the television/audio room. Additionally, they would make an effort to clean their living spaces or homes. Approximately 19.4% of the respondents chose to clean or tidy up their living room, which might help them reduce stress before resuming work in order to concentrate better in a tidy environment. About 14.5% of respondents also enjoyed trying out new recipes in the kitchen to share with their family members.

People who have to deal with interruptions from family and friends may need to develop time-management skills in order to perform daily duties. Table 5 details how respondents dealt with interruptions while conducting work from home during the pandemic. With 25% of the vote, some chose to work in a contained space. This may refer to a location that is adjacent to the main room and is shared by other members. 21.8% of people attempted to minimise interruptions by using signs and symbols that indicate "I am working" and/or "do not disturb." This indicates that the small space at home has an impact on the respondents since they find it hard to adjust to WFH when they have many family members living with them.

**Table 5: Approaches for Coping with WFH Distractions**

<b>Approaches for coping with WFH distractions</b>	<b>Percentage (%)</b>
Working in a contained room	25
Using signs and symbols to indicate “I am working” and “do not disturb.”	21.8
Turning off notification alarms on mobile phones	15.4
Staying away from mobile phones	13.7
Avoiding working in the living room	13.7
Total	100

## **CONCLUSION**

In conclusion, it might be challenging to work from home when there is a lack of space when a large number of family members reside in the same house. This significant subject needs to be handled with caution while under stress. In the future, a better alternative to building low-cost housing units can be suggested by learning more about this community’s requirements in terms of home design and space.

The majority of respondents, as indicated by the data collection, decided that they would want a larger bedroom in the future so that they could practise WFH in more comfort. In addition, their choice of working area for their daily work as an employee will complement this. This is due to the fact that staying in a locked room will avoid family and spouse attention and reduce family stress. They can focus more intently on completing their work and producing a prompt response.

## **RECOMMENDATION**

As part of the process of mitigating the practise of WFH during pandemics like COVID-19, it is hoped that the study’s findings will be used in the design planning of low-cost residential units. The results of this study should lead to advancements in home planning and design, as well as the development of future low-cost housing projects that take the quality of life of the urban poor into greater account.

The practice of working from home can become an option to increase the productive output of a company and mitigate its financial problems in the future. Furthermore, it can be a different strategy to prepare for subsequent periods of any pandemic situation. The benefits and downsides of this approach have been explored in many nations. People prefer to work in a contained/closed-off space and relax in their bedrooms, according to a survey on lower-income

neighbourhoods. Therefore, they have suggested that their bedrooms be made larger.

Authorities may also consider creating a future small working/study space specifically for WFH needs. Children can use this room to study in private or to take online courses during pandemic situations. Developers of affordable housing projects can capitalise on this opportunity by ensuring the most efficient design that fulfils residents' requirements.

The regulations and guidelines for home development must also be regularly revised by the government to provide suitable space requirements. Based on this study's analysis and past research on space adequacy, the Uniform Building By-Law of 1985 should set a standard size for master bedrooms in low-cost housing developments.

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## **QUALITY ASSESSMENT OF DEVELOPMENT PROPOSAL REPORT (DPR) CASE STUDY: SEREMBAN CITY COUNCIL**

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### **Abstract**

Development Proposal Report (DPR) is a document that is particularly mentioned under the provision of paragraph 22(2) Act 172 as one of the elements that need to be referred to and considered in managing the planning permission application process. This is often done to control development as stated under part IV of the Planning Control Town and Country Planning Act 1976 (Act 1720), which states that each application for planning permission submitted to the local planning authority (LPA) shall be accompanied by DPR. Delays in decision-making, a lack of an experienced workforce, adherence to the manual of development proposal reports, and the quality of the development proposal presented by the applicant are some of the problems associated with this study. This study examines the Development Proposal Report (DPR) quality assessment at Seremban City Council under the DPR preparation manual and evaluation of the MyLCP Score Card. This study corresponds with section 21A of the Town and Country Planning Act of 1976 [Act 172], which mandates the submission of the DPR during the application for the planning approval procedure. MyLCP Score Card is an innovation from the PLANMalaysia's Planning Legislation & Regulation Division that aims to help the LPA evaluate the DPR submitted to ensure the quality of the DPR and help the LPA consider granting planning permission more expediently.

**Keywords:** development proposal report, the local planning authority, planning law, planning permission

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## **INTRODUCTION**

Development control is an important component of the planning system, designed to monitor and regulate physical development from the national to the local planning level. It includes sophisticated supporting documents and detailed evaluation by decision-makers from various technical agencies. Dani Salleh (2007) emphasises the significance of methodical decision-making in the development control process due to environmental destruction, natural disasters, and manufactured disasters. This will help to reduce undesirable incidents that may endanger public safety.

Any development must go through the planning permission process for development control purposes. Before any development can take place, planning permissions must be obtained from the local planning authority. The local planning authority's role is to control and regulate land use as specified by law. All planning permission applications must be accompanied by a Development Proposal Report (DPR) that details the proposed development (Yusup et al., 2018).

The document must be prepared by an authorised qualified person as stipulated under the act. The report was created following section 21A of the Act Town and Country Planning 1976 [Act 172] to de-light and refine proposed development for the local planning authority and relevant technical agencies while evaluating a planning permission application. However, PLANMalaysia took the initiative to improve the Development Proposal Report Manual by updating the manual in 2001 (Ministry of Housing and Local Government Malaysia, 2019).

The effectiveness of the manuals used to aid local planning authorities under the Seremban City Council will therefore be examined in this study, along with evaluating the report quality, compliance by consultants, and the use of manuals in general.

### **Development Proposal Report: Town and Country Planning (Amendment) 2017 [Act A1522]**

The Town and Country Planning Act 1976 (Act 172) was amended in 2017 and is now known as Act A1522, published in the Gazette on January 16, 2017. The fifth amendment included two changes: the requirement for SIA for projects submitted to the National Physical Planning Council for advice on the proposed development of seaside reclamation and construction of the nation's primary infrastructure (Sec. 20B(2)). In addition to the amendments, section 21A was added to improve the contents of the development proposal report by incorporating the SIA report (PLANMalaysia, 2018).



The need for changes stems from a desire to promote more inclusive development to achieve more equitable community development. In project planning, social impact assessment (SIA) is a method of assessing social development impact that focuses on people's well-being. Its goal is to analyse community concerns raised by development plans to offer alternative development options and make the best decisions possible to avoid or minimise negative impacts on the community. Nonetheless, Section 21A(1A) of Act 172 empowers the State Authority to decide whether a social impact analysis of development should be included in the DPR (Yusup et al., 2018).

### ***Manual of Development Proposal Report (DPR)***

Since 2001, LPAs, landowners, and town planning consultants have relied on the DPR Manual when submitting development applications. The manual should be able to guide all professional town planning consultants in creating the DPR and assisting LPA in examining planning or land development approvals for its intended purpose (PLANMalaysia, 2018).

The PLANMalaysia has initiated initiatives to improve the 2001 Manual of Development Proposal Report by reviewing the existing and preparing a new Manual of Development Proposal Report (Second Edition), which will assist qualified consultants in creating quality reports in completing development projects, as well as speed up the process of assessing applications for planning approval by local planning authorities and technical experts. This most recent manual also thoroughly explains the various types and procedures that DPR should offer. The content of DPR is further strengthened in 2017 legislative amendments through Act A1152 by including section 21A (ea) to include an analysis of social impacts and preventive measures that can be taken on the expected impact. This provision allows developers to propose solutions to problems that may arise due to a proposed project's expected social impact. Furthermore, the Addendum to the Development Proposal Report specifies the methods for providing social impact analysis and preventive measures in the reports (PLANMalaysia, 2018).

### **The Importance of Development Proposal Report (DPR)**

The DPR is a document specifically mentioned in subsection 22 (2) of Act 172 as one of the things to be referred to and considered when managing applications for planning permission. DPR must be ready to fulfil the following conditions (PLANMalaysia, 2011):

- i. Describe the development proposal as well as its reasoning, highlighting how it complies with the requirements of the development

- plan and the rules and regulations already in effect at the federal, state, and municipal levels.
- ii. Allow local planning authority the ability to swiftly assess and decide on a planning permission application.
  - iii. Enables the organisation in charge of physical planning or activity development to evaluate development ideas in a way that is consistent with sustainable development principles, relying on the extensive information provided.
  - iv. Ensure that all requests for planning approval consider relevant policies, planning, and development in addition to physical, socioeconomic, traffic, and environmental factors.
  - v. Establish a delivery mechanism and structure for coordination between developers, authorities, and other implementing organisations to ensure that all functional and technical needs are fully taken into account.
  - vi. Encourage authorities to monitor mitigation efforts.
  - vii. Used as a guide for enforcement and civil litigation activities as well as appeals considered at the Board of Appeals.

#### **Exemption of Development Proposal Report**

Generally, a DPR must be included with every planning permission application filed by the local planning authority (LPA). However, the requirements of Act 172's subsection 21A(2) give the state's authorities the authority to exempt any development from getting approval, negating the need for DPR preparation. All applications for planning permission for a development proposal, barring any special circumstances, must be accompanied by a DPR (PLANMalaysia, 2010). The following works are exempt from needing a permit under Section 19 (2):

- i. Maintenance work, repairs or any other alterations to a building that only affects parts of the building;
- ii. Work carried out by an authorised agency to install, inspect, repair, renew or maintain infrastructure and utility facilities;
- iii. Any dredging, including dredging of wells for agricultural purposes;
- iv. Using land or buildings for a period of time not exceeding one month or an extended period of time allowed by LPA;
- v. Build or erect on any land temporary buildings to accommodate construction sector workers;
- vi. Using any land or building in the planning of a house for the purpose of enjoying a proper dwelling house; and

- vii. Make material changes to the use of land or buildings designated by the State Authority (SA) as a material change for which planning permission is not required.

However, the exemption from submitting DPR and planning permission varies based on the State Authority's decision.

### **The Responsible Parties Submitting the Development Proposal Report**

Most of Peninsular Malaysia's local planning authorities currently utilise registered town planners to prepare DPRs for applications for planning permission. A registered town planner is a person who has met the requirements to practise urban and rural planning in Malaysia and has been endorsed by Town Planners Malaysia. According to subsections 21C (a) and 21C (b), all plans, particulars, layout plans, and other documents must be prepared by either a person who meets the requirements of paragraph 58(2)(h) or a person who is authorised to do so by any other written law.

The qualifications of anyone who may develop or submit plans, documents, particulars, and layout plans for Act 172 are outlined in paragraph 58 (2) (h). Additionally, the Town Planning Act of 1995 (Act 538), Section 13(1), gives registered town planners the right to be considered persons qualified to write DPRs. According to Section 13 of The Town Planning Act of 1995 (Act 538), field registered town planner expertise is as follows:

- i. Prepare development plans such as structure plans and local plans for the purpose of the Town and Country Planning Act 176 (Act 172)
- ii. Carry out urban, rural and regional development planning studies, and feasibility and environmental impact assessment studies relating to land use; and
- iii. Prepare and submit an application for planning permission, subdivisional layouts, drawing and planning reports to any person or public authority for the purpose of developing any land.

### **Development Proposal Report as Development Control Instruments**

Peninsular Malaysia employs two layers of development control: the state and municipal levels. Peninsular Malaysia's state governments are alone in charge of all land use-related issues, including boundary alterations, land consolidation, and other issues on land in their respective states (Abdullah et al., 2011). At the local level, local authorities such as Seremban City Council's Development Department Planning are in charge of regulating development in its planning area concerning technical considerations such as layout, building design, transportation system, and provision of public facilities.

### **Research Methodology**

Due to the nature of the study and the use of the MyLCP Score Card in Seremban City Council as an evaluation tool for development proposal reports in the study area, a case study research methodology was used for the investigation. Due to its extensive discussion of policies and implementation techniques, the qualitative research method was adopted. Data collected through primary and secondary data gathering were used as a source in this study. Following is a breakdown of particular procedures employing the primary and secondary methods indicated above:

*i. Documents and Records*

This study uses existing data, including physical documents and records-based materials. All records and documents about this topic, specifically the Manual of Development Proposal Report (2nd Edition), were gathered from the Seremban City Council.

*ii. Expert Interview (Judgemental Sampling)*

Due to the COVID-19 pandemic, online interviews were used to collect primary data. The interview was conducted with two (2) Town Planning Officers in Seremban Municipal Council and one (1) representative from private sector consultants. The interview was conducted using a judgmental sampling method to avoid the possibility of missing information from the respondents. Each expert responds to questions in their field of expertise, and the responses are consolidated to fit the scope of the study. The interview method is a simple pre-arrangement online interview session in which informants were asked a series of close-ended and open-ended questions about the study. The informants include the local planning authority (Seremban City Council) and the consultant's representative (RA Planning and Management and Services). The discussion will also focus on data from the Seremban City Council regarding MyLCP SCORECARD compliance by registered persons during planning permission applications. This is to clarify further why the Seremban City Council gathered such data.

### **FINDINGS AND DISCUSSION**

MyLCP Score Card is an innovation inspired by the PLANMalaysia Planning Legislation and Regulatory Division to assist the Local Planning Authority in assessing the Development Proposal Report (DPR) submitted by a qualified person. Furthermore, it served as a reference for the submitting person in preparing a good DPR for approval (PLANMalaysia, 2021). The Seremban City Council has adopted MyLCP Score Card as a method of evaluating the DPR

prepared in order to ensure quality decision-making by the LPA, as the report covers the required planning aspects and can be used as the basis for consideration of the development proposal. The DPR evaluation via MyLCP ScoreCard will cover six (6) criteria outlined in the existing Development Proposal Report Manual (2nd Edition). The six (6) criteria listed below are not new to LPAs or applicants;

- i. Content, format and accuracy of information.
- ii. Concept, justification for development, location plan, site plan and title details.
- iii. Site planning analysis; - +landuse, topography, geology, landscape, environmental quality, drainage, flora and fauna, building details, infrastructure, utilities, public facilities and development potential.
- iv. Explanation of proposed development;- development concept, layout plan.
- v. Compliance with development plans: - National Development Plan, State Structure Plan, Local Plan, compliance with other technical requirements, policies related to development plan, related laws and special incentives.
- vi. Explanation of the impact of development: - physical, economy, infrastructure and utilities, social, environment and natural disaster.

Overall, the MyLCP Score Card has different evaluation criteria for each type of planning application. The criteria are divided into the following types of planning permission:

- i. DPR Category 1A – Planning Permission for Building erection
- ii. DPR Category 1B - Planning Permission for Building demolition
- iii. DPR Category 1C - Planning Permission for Building Alteration
- iv. DPR Category 1D - Planning Permission for Development involving airspace
- v. DPR Category 2 - Planning Permission for Engineering works
- vi. DPR Category 3 - Planning Permission for Mining
- vii. DPR Category 4 - Planning Permission for Industrial
- viii. DPR Category 5- Planning Permission for Material Change of use (land)
- ix. DPR Category 6 - Planning Permission for Material change of use (building)
- x. DPR Category 7A - Planning Permission for Subdivision/Amalgamation of land without building erection

- xi. DPR Category 7B - Planning Permission for Subdivision/Amalgamation of land with building erection.

The marks of each requirement will be subject to the jurisdiction of the officers in charge. The total mark for all criteria is 100, and the weightage for each criteria varies depending on the type of planning permission submitted to the LPA. MyLCP score card provides specific marks and merit on the details in the DPR submitted through total compliance scores on the relevant criteria.

### **The Advantages of the MyLCP Score Card**

To accomplish the better implementation of the development control system, quality assurance in DPR preparation is crucial. According to the interview session, all information in the DPR supporting a planning application must be consistent with the requirements of other planning documents, such as the local plan, planning standards and guidelines, government policies, and others. Consequently, a quality DPR has its advantages and was anticipated to help in the following ways:

- i. Local Authorities
  - a. Ensure that all parties use a justified or knowledgeable decision assessment process to evaluate and decide on a planning proposal.
  - b. Assist local government agencies in updating the centralised database with the information presented in the report on the proposed development.
- ii. Consultant
  - a. The consultant who prepares the report and examines in depth the development and planning components will benefit from the thorough details in the DPR.
  - b. Technically, this is done to make it easier for other professionals to gather direct planning information and use development proposal reports as references.
- iii. Developer / Landowner
  - a. Encourage property developers and landowners to be mindful and aware of the importance of the development proposal report in obtaining a planning authority approval.
  - b. The development proposal report is a detailed record that developers or landowners may use to present their cases to the Appeal Board.

**Table 1.1:** Criteria of assessment in MyLCP Score Card.

Criteria	Marks/Merit (%)
C1 – Content, format and information accuracy	5
C2 – Development justification, concept, location plan, site plan & details	15
C3 – Site analysis	10
C4 – Explanatory Development Proposal	10
C5 – Development Plan Compliance	35
C6 – Development Impact	25

A good DPR will be accepted without modification if the DPR score reaches the specified value level, as shown in the table above. DPRs with less than 50% marks will not be accepted, while DPRs with 51-80% marks will be accepted subject to amendment. DPRs with a score of more than 80% will be accepted but subject to written amendment by LPA. MyLCP Scorecard has been adopted as the new standard for evaluating the DPR in LPA. It benefits Seremban City Council and informs consultants/applicants about the aspects that need to be improved to produce quality DPR. In short, the DPR, which is reviewed and evaluated using MyLCP Score Card, has assisted the LPA in making better decisions to protect the interests of the community and the environment.

Seremban City Council’s planning permission is divided into two (2) categories: Planning Permission for Building Erection and Planning Permission for Land Matter. Due to the nature of the application, Planning Permission for Building Erection will use criteria from DPR Category 1A to DPR Category 1C, whereas Planning Permission for Land Matter will fall under DPR Category 1D to DPR Category 6.

Table 1.2 demonstrates the unsatisfactory compliance rate on most of the DPR during planning permission submission. In this regard, an interview with a responsible officer from the Seremban City Council reveals that only about 50-65 per cent of consultants adhere to the manual preparation of development proposal reports. According to the informant, some of the most common mistakes applicants include irrelevant documents, incorrect information, plagiarism, insufficient site analysis, and other flaws in report writing.

**Table 1.2:** The number of Planning Permissions processed by Seremban City Council and their scores on the MyLCP Score Card.

Score	2019 (No.)	2020 (No.)
Planning Permission (Building Erection)		
>80%	1	-
51-80%	1	10
<50%	14	1
<b>Total</b>	<b>16</b>	<b>11</b>
Planning Permission (Land Matter)		
>80%	2	4

51-80%	5	4
<50%	7	9
<b>Total</b>	<b>14</b>	<b>17</b>

The number of applications for planning permission (land conversion) that the Seremban Municipal Council received from 2019 until 2020 are presented in Table 1.3. The findings revealed a relatively low overall score for both years, with the combined percentage of good DPR scores falling below 25%. A good DPR should have received a score higher than 75%. According to the findings, only 16% (2019) and 23% (2020) of the development applications have the potential to be evaluated as having a satisfactory DPR when using the MyLCP Score Card.

**Table 1.3:** MyLCP Score Card for Land Conversion between 2019 and 2020

2019								2020							
Criteria	C1	C2	C3	C4	C5	C6	Total	Criteria	C1	C2	C3	C4	C5	C6	Total
<b>Full Marks</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>35</b>	<b>25</b>	<b>100</b>	<b>Full Marks</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>35</b>	<b>25</b>	<b>100</b>
Application 1	1	10	6	2	1	0	20	Application 1	4	9	6	3	6	8	36
Application 2	1	8	5	6	1	8	29	Application 2	4	9	4	2	4	14	37
Application 3	1	8	5	6	1	8	29	Application 3	5	9	6	2	4	16	42
Application 4	1	11	6	3	8	8	37	Application 4	5	8	5	1	13	16	48
Application 5	3	10	5	3	8	10	39	Application 5	1	6	7	7	11	19	51
Application 6	2	9	5	8	19	5	48	Application 6	2	15	9	10	10	8	54
Application 7	2	9	5	8	19	5	48	Application 7	2	15	9	10	10	8	54
Application 8	0	13	8	6	5	21	53	Application 8	2	15	9	10	10	8	54
Application 9	0	13	8	6	5	21	53	Application 9	4	12	7	9	14	11	57
Application 10	5	13	10	10	13	4	55	Application 10	4	12	6	8	19	12	61
Application 11	2	11	4	6	11	24	58	Application 11	5	11	9	8	14	19	66
Application 12	2	11	4	6	11	24	58	Application 12	4	13	5	10	13	21	66
Application 13	1	15	10	10	23	22	81	Application 13	3	15	9	10	9	23	69
Application 14	1	15	10	10	23	22	81	Application 14	4	12	6	10	28	22	82
								Application 15	5	15	10	6	25	23	84
								Application 16	5	15	9	10	30	15	84
								Application 17	4	13	9	10	29	21	86

Similarly, a low score on the MyLCP Score Card for the DPR of Planning Permission (Building Erection) was also recorded between 2019 and 2020. It was found that only 6.25% of DPR in 2019 and 27% of DPR in 2020 can be considered to be of a quality sufficient for obtaining planning permission. The



data analysis showed many flaws in how the DPR is prepared on the part of the person submitting it (Table 1.4).

**Table 1.4:** MyLCP Score Card for Building Erection between 2019 and 2020

2019								2020							
Criteria	C1	C2	C3	C4	C5	C6	Total	Criteria	C1	C2	C3	C4	C5	C6	Total
<b>Full Marks</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>35</b>	<b>25</b>	<b>100</b>	<b>Full Marks</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>35</b>	<b>25</b>	<b>100</b>
Application 1	0	9	5	1	0	0	15	Application 1	4	14	2	3	0	0	23
Application 2	2	11	1	2	0	0	16	Application 2	1	13	9	4	15	13	55
Application 3	3	8	9	1	3	0	24	Application 3	2	11	4	6	24	12	59
Application 4	3	13	5	7	0	0	28	Application 4	3	12	5	1	13	21	55
Application 5	0	8	6	5	2	13	34	Application 5	2	10	7	9	15	20	63
Application 6	0	11	6	1	10	8	36	Application 6	3	14	10	0	30	12	69
Application 7	1	7	7	1	13	8	37	Application 7	2	13	9	6	30	12	72
Application 8	2	13	5	2	13	3	38	Application 8	2	13	9	6	30	12	72
Application 9	0	13	6	1	10	8	38	Application 9	4	14	10	10	25	12	75
Application 10	2	11	5	10	2	10	40	Application 10	5	13	8	10	25	15	76
Application 11	2	10	6	6	13	8	45	Application 11	5	15	9	9	35	17	90
Application 12	3	12	7	6	15	6	49								
Application 13	3	12	7	6	15	6	49								
Application 14	3	12	7	6	15	6	49								
Application 15	4	14	7	9	15	1	50								
Application 16	3	15	10	7	35	1	71								

### Insufficient Technical Explanation

The interview session uncovered additional information that revealed that most declined planning applications either have an insufficient explanation for the proposed development or incomplete technical details. During the technical meeting and the decision-making process, the Responsible Officer in LPA will find it extremely challenging to comment on and support the development proposal. It is, therefore, inevitable to turn down the application and request that the Submitting Person make amendments.

### Ethics and Behavior of Submitting Person

The interview session sheds light on the fact that some applicants deliberately disregarded the Manual DPR to expedite the process of submitting their planning applications. Before submitting a planning application, the principal person responsible for submitting planning permission will frequently shirk their responsibility to adhere to the LPA's guidelines. The Principle Submitting

Person's efforts to provide the LPA with a high-quality DPR were made even more difficult by the persistent pressure from the client to speed up the approval process and the challenges involved in responding to all of the technical comments.

### **Approval Time Frame**

Inadequate time for amendment was also mentioned by informants representing the submitting person, particularly regarding comments from various technical agencies. To address the technical agencies' comments, the submitting person was required to arrange a personal consultation with the relevant agency for further clarification. The planning firm and submitting person must devote more time to site investigation and collection of planning documents to support the DPR so that all details conform to the assessment criteria.

**Table 1.3:** Mean for MyLCP Score Card based on Criteria between 2019-2020

<b>Criteria</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>	<b>C5</b>	<b>C6</b>	<b>Total</b>
<b>Full Marks</b>	<b>5</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>35</b>	<b>25</b>	<b>100</b>
<b>Planning Permission for Land Conversion</b>							
<b>2019</b>	1.6	11.1	6.5	6.4	10.6	13.0	49.2
<b>2020</b>	3.7	12.0	7.4	7.4	14.6	15.5	60.6
<b>Planning Permission for Building Erection</b>							
<b>2019</b>	1.9	11.2	5.8	4.4	10.1	6.1	39.6
<b>2020</b>	3.0	12.9	7.4	5.8	22.0	13.3	64.4

### **Human Resources Factors**

In addition, the lack of staff and skilled workers at the planning firm and consultant impeded preparing a good DPR to meet the requirements outlined in the MyLCP Score Card. It is extremely difficult for planning firms to prepare their staff with the appropriate skills and knowledge to maintain the vitality of the planning profession. This is because the development process is both complex and constantly changing. It was also suggested that before the LPA started implementing new procedures relating to planning permission, the LPA should provide sufficient engagement and training to all industry players to improve the procedure as a whole. This is done to ensure that industry players and LPAs can communicate and collaborate more effectively to make the planning process more efficient.

### **Difficulties in Complying with the Provision in Development Plan**

The mean level of compliance with the stated criteria is displayed in Table 1.3 of the MyLCP Score Card. It has been documented that DPR C5 and DPR C6 have the lowest scores compared to the overall marks for each category. This indicates that the principal submitting persons have difficulties adhering to the

development provision and explaining the development impact during the planning permission submission process. The local plan contains all the necessary provisions for controlling the usage of land and building to achieve the vision of the local administrative body within the next 5-10 years. The local plan also possessed sophisticated mechanism control in land use activities to diminish the negative impacts of the development. Consequently, these contribute to the difficulties in adhering to all the provisions in the local plan during the planning permission submission process.

## **CONCLUSION**

Finally, DPR is a requirement closely related to the Planning Permission (KM) application under Part IV (Planning Control) of the Town and Country Planning Act of 1976. (Act 172). Without it and other planning-related documents, the application is likely to be incomplete, which may result in the rejection of an application for development project approval. The approval period may be delayed because applicants must prepare this report ahead of time and seek technical advice from relevant agencies. The quality of DPR is critical for LPA because this report will aid in their tasks and speed up the planning process.

This includes saving time for local governments because certain information is readily available to allow them to make decisions. In general, DPR will provide local authorities with an overview of the proposed development. Facts such as justification for development, explanation of the concept of development; in conjunction with existing development plans, policies, or government policies, and clarification on the impact of the development will assist LPA in making the best decision on an application.

Compliance with the Second Edition Development Proposal Report Manual and MyLCP Score Card ensures the quality of the DPR, which serves as the primary reference document for local planning authorities, technical agencies, and decision-makers at the federal, state, and local levels involved in considering a planning permission application.

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## **QUALITATIVE ASSESSMENT OF USABILITY AND ACCESSIBILITY OF HOUSING DESIGN ELEMENTS FOR DISABLED PEOPLE**

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### **Abstract**

Accessibility has become a challenge in today's societies where everyone has equal rights to live in a barrier-free and accessible environment. A previous study indicated that those living in high-rise residences have limited access to facilities for the disabled that are provided in accordance to the Garis Panduan Reka Bentuk Sejagat (Universal Design). This paper aimed to determine the level of accessibility of selected six (6) design elements such as the ramp, stairs, main entrance, the lift, handrails, and parking space and the usefulness of legislation and standards in PPR Pekan Batu, Kuala Lumpur. Qualitative assessments were applied for the study using content analysis of planning guidelines and site observation. The results demonstrated that the efficiency of legislation and standards was a factor in the accessibility and usability of housing design elements for PWDs. Three (3) design elements- the stair, parking space, and main entrance, had recorded the lowest compliance scores compared to another two (2) elements- ramps and handrails, which recorded the second lowest compliance score. Meanwhile, the lift was recorded as the most compliant element based on its accessibility. The outcome of this study implied that different types of disabilities require varied housing accessibility requirements. This study improves accessible design elements for the disabled, resulting in a better environment.

**Keywords:** Usability, Accessibility, Design Element, People with Disabilities (PWD)

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## **INTRODUCTION**

Disability is any continuing condition that restricts daily life activities (Chai Jing, 2019). People with disabilities are defined as those who cannot participate fully in the community because of physical or mental disabilities that occur at birth or later in life. There are many shortcomings, obstacles, and problems facing persons with disabilities. Walking, listening, working, learning, hearing, and performing manual activities are confined to their everyday lives. In addition, their lives are filled with barriers everywhere they go, in residences, public buildings, and so on. Therefore, to decrease accessibility challenges that are faced by the disabled, architects, engineers, and developers should consider their needs for design and construction infrastructure.

Today's poorly constructed environments remain inaccessible for disabled people (PWD) and older adults. Thus, Malaysia needs to increase accessibility for numerous reasons, one of which is due to the changing demographics. Along with the growing number of people with disabilities, the search for independence and equal rights has also increased (Bashiti, 2015). This situation will also significantly impact how the built environment is planned. Individuals with different disabilities, sizes, and ages should engage freely in the built environment. Various users need different needs when developing. Since some people rely on other skills to build knowledge of their environment, it is necessary to consider all of them. To achieve social justice in all regions, eliminating obstacles and ensuring access are fundamental needs for disabled citizens in Malaysia.

All design requirements are for the making of good designs, as have been demonstrated by human factors. Designers must understand the basic human processing requirements. Universal design has particular challenges as it seeks to improve accessibility for various users. Problems such as the lack of usable and accessible housing and the lack of physical access to user-friendly facilities have resulted in issues that are related to the housing design quality for PWD (Syakir et al., 2018). Universal's design philosophy is a shift towards inclusion that promises better solutions for people with different capabilities. Universal design is necessary for incorporating other groups of users into the design space to support users of all ages with different abilities. In this study, the provision of facilities can be defined as providing uninterrupted facilities or facilities in a residential area where its occupants or others can access at any time. Therefore, public buildings with a barrier-free design should be developed since they promote integration and equal access through a safe and practical method for everyone (Chai Jing, 2019).

## **PEOPLE WITH DISABILITIES (PWD) IN MALAYSIA**

Table 1 shows the registration of Persons with Disabilities (PWDs) in Malaysia, which has increased from the year 2016 to the year 2021. Based on 592,854

registered PWD in 2021, there was an increasing number of those with disabilities, mainly in Selangor and Kuala Lumpur. The increased number showed that it was necessary to provide them with accessible indoor and outdoor facilities not only in public buildings but also in the place they called home. In this case, seven (7) categories of PWDs can be considered for registration; Hearing Impairment, Visual Impairment, Speech Impairment, Physical Impairment, Learning Disabilities, Mental Disabilities, and Multiple Disabilities.

**Table 1:** Registration of Person with Disabilities (PWDs), 2016-2021

Year	Total Number (Malaysia)	Total Number (Selangor & Kuala Lumpur)
2016	409,269	88,427
2017	453,258	100,771
2018	497,390	106,875
2019	548,195	126,301
2020	581,265	131,576
2021	592,854	137,189

*Source: Jabatan Kebajikan Masyarakat (2021)*

## LEGAL PROVISION FOR PWDs IN MALAYSIA

In Malaysia, the Person with Disabilities Act 2008 (Act 685) (Malaysia) declared that People with Disabilities have equal rights and chances as ordinary people. According to this Act, there are provisions on the rights of the disabled under Part IV, such as the right to access and use facilities, amenities, services and public buildings (section 26), the right to access and use public transport facilities, amenities and service (section 27), access to education (section 28), and access to employment (section 29). At the same time, the right to access information, communication, and technology is based on equality with the disabled (section 30), the right to access cultural life (section 31), as well as the right to participate in recreational, leisure, and sports activities, is based on equality with the disabled, is also provided subject to the existence of any circumstances that may endanger the safety of the disabled (section 32). Thus, all stakeholders such as the local authorities, developers, contractors, and builders must take an imperative approach to inspire and support services at housing, other facilities, and its surrounding for the disabled. For this study, the scope is focused on section 26 only.

Meanwhile, the Uniform Building by Law (UBBL) is a guide for housing developers, specifically in avoiding discrimination between PWDs from the community. There are also standards or codes of practice on access for disabled persons to public buildings, Malaysian Standard Code on Access for Persons with Disabilities (MS1184:2002) and a code of practice for access of

disabled persons outside the buildings, ms1331:2003, which should be met in all new development including housing. The MS1184 is used to develop universal design facilities as major guidelines by housing developers. In addition, the Universal Design Guideline (*Garis Panduan Reka Bentuk Sejagat*) was provided by PLANMalaysia, which highlighted housing design and surrounding developments of amenities and facilities for PWDs. However, there is a need to review the level of compliance with the provision of facilities and infrastructure requirements for PWDs. Even though the policies on the condition of such needs already exist, their implementation is still not widespread, mainly in the context of high-rise residential buildings.

### **THE USABILITY OF DESIGN ELEMENTS IN HOUSING**

People want to remain in their homes and yet be a part of their communities. People with disabilities and the elderly require freedom, independence, and security to facilitate their mobility around the house. Thus, the house design is critical not only to reduce the risk of trips but also to be easily accessible and effective (Shahrom & Zainol, 2015). Shahrom and Zainol (2015) have described the interaction of the functional status of one person with the physical, cultural, and policy environment as a disability. When an individual cannot use the full range of body functions and cannot effectively collaborate with the accommodation and support, he or she is considered to have disability functional limitation.

People with disabilities have negative aspects of interaction due to their physical impairment, activity limitations, and contextual factors. Hence, as they are housebound and dependent; they need proper housing and habitation, whereby better housing design facilities may aid in their rehabilitation. Notably, this study implies that universal design idea covers the disabled, and considers their different abilities and ages. The universal design in housing is a building concept that has been applied to homes that include features, products, and procedures. All designs that everyone can use can benefit from applying the universal design principles (Dua, 2020). The regulations and guidelines of the universal design are as follows:

- i. Equitable - practical, functional, fair and viable to everyone with various types of abilities
- ii. Flexibility - the variety of choices for personal preference and skills
- iii. Easy, simple and perceptive - easy to grab and understandable
- iv. Perceptible information - effective for the user
- v. Tolerance for error - minimal dangers and the unpleasant accidents
- vi. Low physical effort - efficient and comfy to use with minimum exhaustion



- vii. The dimension - size and space which is suitable for reach, manipulation, use and grab

Home design and modification need to meet the requirements of the household. A universal design in housing should provide a ramp, toilet, appropriate space, entrance, handrail, and practical design, as shown in Table 2.

**Table 2:** List of housing design features with the description of universal design in housing

Design Features	Description
Entrance	<ul style="list-style-type: none"> <li>• Stepless entrance</li> <li>• Sloping walks at 1:20 max</li> <li>• Min 5'x5' level clear space inside and outside the door</li> <li>• The light doorbell at a reachable height</li> </ul>
Circulation	<ul style="list-style-type: none"> <li>• Interior and vertical circulation - 30"x48" clear floor space</li> <li>• Improve circulation</li> <li>• Easy access</li> <li>• Accessible for wheelchair users</li> </ul>
Bathroom and Toilets	<ul style="list-style-type: none"> <li>• Provide clear floor space</li> <li>• Curbless shower</li> <li>• Provide handrails - easy to grab and move.</li> <li>• Handle, faucet, control - single lever handles</li> </ul>
Kitchen	<ul style="list-style-type: none"> <li>• Space between a face of cabinets and walls - 30"x48" clear floor space</li> <li>• Clear knee space under the table and sink</li> <li>• Adjustable height in wall cabinet - max reach controls 24"x46"</li> <li>• Allow a person to work while sitting</li> </ul>
Switches and Controls	<ul style="list-style-type: none"> <li>• Reachable height - 15"-48"</li> <li>• Accessible to children and wheelchair users</li> <li>• Easy-touch or hands-free switch</li> <li>• Portable battery powered/ using the remote control</li> <li>• Easier to reach with hands full (e.g. with elbow)</li> </ul>
Windows	<ul style="list-style-type: none"> <li>• Windows for viewing, 36" max sill height</li> <li>• Can look out from the seat</li> <li>• Reachable to open, close and lock</li> </ul>
Doors	<ul style="list-style-type: none"> <li>• Clear opening. The open door should extend 2' min or more 90 degrees</li> <li>• Accessible</li> <li>• Outside open-loop handles</li> <li>• Latches are operable without grasping or twisting</li> <li>• Max 48" height and easy to open</li> </ul>
Floor	<ul style="list-style-type: none"> <li>• Non-slip floor surface - 30"x48" clear floor space</li> <li>• Avoid slippery surfaces</li> </ul>

Stairs	<ul style="list-style-type: none"><li>• Easy to move</li><li>• Provide handrails - to grab and for the barrier</li><li>• Provide ramp, 1:2 max</li></ul>
Ramp/Curb	<ul style="list-style-type: none"><li>• Accessible to all people</li><li>• The slope of 1:2 max</li><li>• Easy for mobility impairment and stroller.</li></ul>

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*Source: Shahrom & Zainol (2015)*

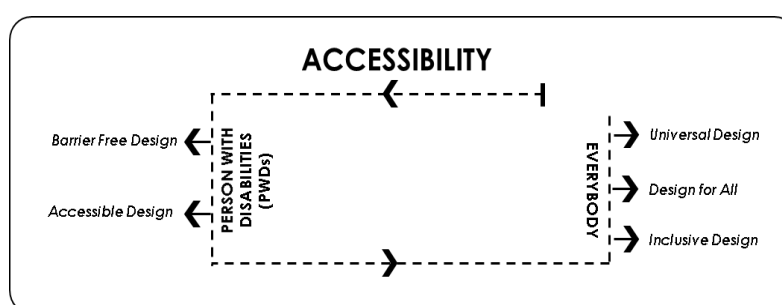
The design of a person's home can support engagement both inside the house and in the community if it considers their functional needs. This is supported by Rangga et al. (2020) who have claimed that to enhance usability, easy access to design features is highly recommended. Easily recognisable entrances enable access to the community and neighbourhood. People may feel more energised or motivated to engage in community activities if their homes have bathrooms that make bathing simple and comfortable, kitchens that are designed to support meal preparation, and bedrooms that permit safe transfers and are suitable for getting enough rest (Greiman, Koon, Schulz, & Nary, 2022). For the purpose of this paper, only six (6) design elements concerning accessibility and usability were covered as the focus of the study. In addition, they were only measured within the surrounding access, and not inside the individual's house unit.

### **ACCESSIBILITY OF DESIGN ELEMENTS IN HOUSING**

According to Shahrom and Zainol (2015), there were six (6) aspects of Universal Design Index (UDI) to rate housing accessibility: 1) connectivity, 2) usability, 3) safety, 4) accessibility, 5) integrated design, and 6) operation and maintenance. Their study also claimed that they had thought that universal design in housing only cared about accessibility, however the concept of universal itself showed that it is usable for everyone. Figure 1 shows the terminology that is related to the Universal Design Concept. In the context of housing, there was no correlation between universal housing and barrier-free or disabled housing. Universal housing is designed to be usable for most individuals for a lifetime without considerable change.

Meanwhile, Shobri et al. (2018) have claimed that accessible design only benefits the PWD. Individuals with multiple disabilities have distinct accommodation, support and facility requirements from the general population. Thus, accessibility is the most significant aspect of housing for the disabled. Jin et al. (2018) has stated that accessibility is always associated with spatial relations or topology; these connections between spaces have suggested spatial integration in a building and spatial depth, and is one of the representative concepts. This statement is supported by Syakir Amir et al. (2018), who has claimed that housing locations that are far from direct access result in the disabled not owning or

buying their own houses. In addition, Ng (2019) stated that accessibility was necessary to measure the effectiveness and efficiency of the Malaysia Standard and Universal Design in terms of its compliance. Meanwhile, Adriana et al. (2020) in their study suggested the notion of accessibility for high-rise residential buildings including the possibility for PWDs to have their house unit on the ground floor of the block. Also, Cornelia et al. (2022) has claimed that the inclusion of housing features in the future will provide additional insights into the accessibility needs of different populations including PWDs.



**Figure 1:** Terms related to Universal Design Concept  
Source: Yusof & Jones (2014)

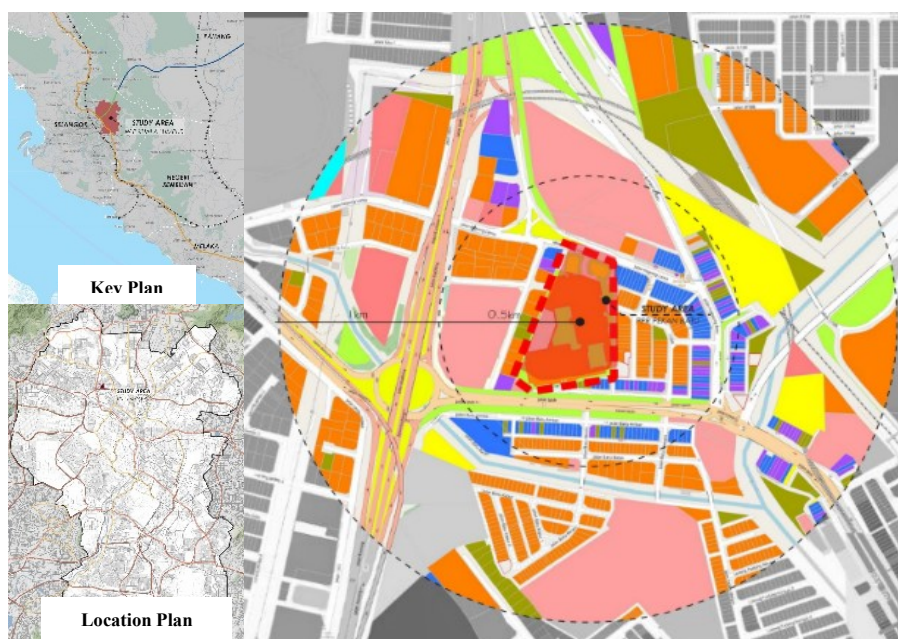
Based on previous studies, it was found that there was a lack in terms of analysis concerning supporting facilities for PWDs in residential areas. Previous studies have only examined the housing needs of PWDs, such as the interior design of the home, satisfaction and preferences of the disabled regarding housing design elements, factors that are influencing the disabled daily mobility in residential facilities, availability and access to physical facilities, universal design assessment and house accessibility using *Garis Panduan Reka Bentuk Sejagat*. Thus, the relationship between accessibility and usability of design elements for PWDs in residential areas was studied to fulfil the research gap.

## METHODOLOGY

### *Study Area*

PPR Pekan Batu is a low-cost condominium in Kuala Lumpur's Batu Caves district (Figure 2). The government completed the project in 2000 as part of the People's Housing Project. The project is situated on leasehold land and is strata titled. The government has been striving to upgrade the property's facilities. PPR Pekan Batu comprises two (2) blocks, namely Block A and Block B. The complex contains a high-rise apartment building with a total of 496 units and an estimated population of 2,480. There are 18 storeys, each with 16 units. Each block is equipped with three (3) elevators or lifts. There was only one (1) layout, consisting of three (3) bedrooms and two (2) bathrooms, with a total built-up area

of 650 square feet. This area was selected as a case study as it was designed as the primary residential area surrounded by other residential properties such as 99 residences and Seri Wahyu Residence. It was also located near the public transportation (MRT Taman Wahyu, MRT Kampung Batu, MRT Batu Caves), public amenities and accessible facilities that provide additional services to the residents, including the PWDs. Apart from that, this PPR was a government project under an affordable housing scheme that aimed to assist mainly the B40 group to purchase their home at affordable prices with adequate facilities.



**Figure 2:** Study Area and its Adjacent Land Use within 1 km Radius  
*Source: Draf Pelan Strategik Kuala Lumpur (2020)*

### ***Method***

As this study had focused on the qualitative method, the observation and content analysis of documents were applied. The design of a research method was formed following the research topic and objectives. The study used a qualitative approach with observation, measurement, photography and document review to determine the usability and accessibility of the selected six (6) housing design elements for PWDs.

### ***Site Observation and Content Analysis***

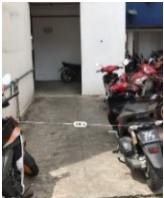




The study was to understand the essential characteristics of a person, group, or environment in observational research, nothing had been monitored or


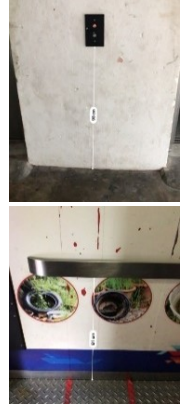

manipulated, as such it was not experimental. Therefore, it was conducted using a structured observation that involved a detailed explanation of the categories to be documented. The observation form design approach was used visually and precisely to compile qualitative data by identifying issues related to accessibility and usability. This approach was also applied to determine the usability or functionality of all the design elements or indicators, which had included parking space, walkways, ramp, handrails, stairs, lifts, and connectivity from one point to another. The characteristic, as referred to in the guidelines, had been defined in the survey form, in which the usability and accessibility of the design elements for disabled people were determined. Observation using a checklist was supported by photography, which was conducted between June 2021 till July 2021, whereby each observation had taken three (3) hours to complete. Content analysis was performed to review and analyse the compliance with *Garis Panduan Reka Bentuk Sejagat*. The Rank Matrix on level of accessibility and usability as well as observation were applied in the form of a Table, using Radar value (which was generated manually from Excel) as an outcome of the study.

## **RESULTS AND DISCUSSION**

This study has used structured observation, which typically renders the observation material all the more inflexible than an unstructured observation. It has been performed to determine the usability or functionality of the design elements, including parking spaces, walkways, ramps, handrails, stairs, lifts, and connectivity. The characteristic referred to the universal design requirements of the *Garis Panduan Reka Bentuk Sejagat*, in which the usability for disabled individuals and accessibility were also determined. The result from the compliance checklist for the listed design elements was summarised (Table 3). The content analysis was made by analysing six (6) design facilities referring to the *Garis Panduan Reka Bentuk Sejagat*.

**Table 3:** Analysis of Selected Design Elements for Accessibility in Compliance to  
*Garis Panduan Reka Bentuk Sejagat*

Design Elements	Standards	Compliance			Remark
		1	2	3	
Ramps	Ramps shall be provided outside and inside all public and commercial buildings, public transport terminals, car parks, multi-story residences and recreational areas to connect pedestrian walkways.			/	 
	Unrestricted ramp on the left and right shall be provided with a curb with a minimum height of 100 mm for the safety of wheelchair users and crutch users	/			
	Guiding blocks / tactile blocks should be provided at the beginning and end of the ramp gradient to warn and guide the visually impaired.	/			
	The maximum for the ramp slope must be 1:12 with a minimum width of 1500 mm.		/		
	The surface of the ramp must be of a non-slip and suitable material			/	
Stairs	Stairs, elevators and escalators shall be provided to provide access to individuals in multi-story buildings.	/			 
	Guiding blocks / tactile blocks shall be provided on stairs, elevators and escalators as a guide to physical barriers or warning.	/			
	Width of the stairs not less than 900 mm			/	
	Tread between 260 mm - 300 mm			/	
	Riser of the stairs 180 mm maximum		/		
	The landing of the stairs not less than 1200 mm		/		
	Handrail provides each side of stairs		/		
	Floor finishes use non-slip material			/	
Handrail	Texture and colour of the stairs are distinguished from landing and floor level			/	
	Handrail shall be provided on sidewalks, building corridors, ramps and building stairs		/		
	Handrail shall be installed at a minimum of 840 mm and a maximum of 900 mm from the floor level			/	
	Handrail shall have a minimum distance of 50 mm and a maximum of 100 mm from the walls of the building		/		
Handrail shall have a minimum circumference / width of 40 mm and a maximum of 60 mm and shall be non-slip and safe to grasp		/			
Doorway and main entrance	All main entrances to the building shall provide access to wheelchair users to enter the building	/			
	Guiding blocks / tactile blocks shall be provided at the entrance and exit of the building			/	
	The floor surface shall use contrasting materials and			/	

	colour for the purpose of warning signs for the visually impaired.				
	The entrance of the building must have a minimum width of 900 mm. However, the minimum width for hospital entrances and sports complexes is 1000 mm	/			
	Space for twisting (turning radius) for wheelchair users shall be provided with a minimum diameter 1200 mm	/			
Lift	Lifts shall be provided to provide access to individuals in multi-story buildings	/			
	Guiding blocks / tactile blocks shall be provided on stairs, elevators and escalators as a guide to physical barriers or warning			/	
	A minimum of 1 elevator near the main entrance of the building should be accessible to wheelchair users and have space to rotate 180 degrees	/			
Parking	Parking for wheelchair users shall be provided outside and inside all public	/			
	Provide near the main entrance		/		
	Parking should be provided on a flat surface		/		
	A step ramp / dropped curb with a minimum width of 1200 mm shall be provided as access to the pedestrian walkway outside the building.			/	
	For Indoors, the parking space should be level with the surrounding walkway. Step ramps or dropped curbs with a minimum width of 1000 mm and a maximum of 1050 mm shall be provided if uneven.			/	
	Parking symbols for wheelchair users must be provided and visible when entering the parking area.	/			
	Parking symbols for wheelchair users should also be provided on the surface of the parking space	/			
	A building must have a minimum of 1 wheelchair parking space for every 25 public parking spaces, or 1 space for every 2 public parking spaces if there are only 2.	/			
	The minimum size of right-angle parking is 3600 mm wide x 4800 mm long. If the parking facility is parallel to the road, the minimum size is 3600 mm wide x 6600 mm long.	/			

Note: 1 - All requirements are not met/ facility is not provided even though it is necessary

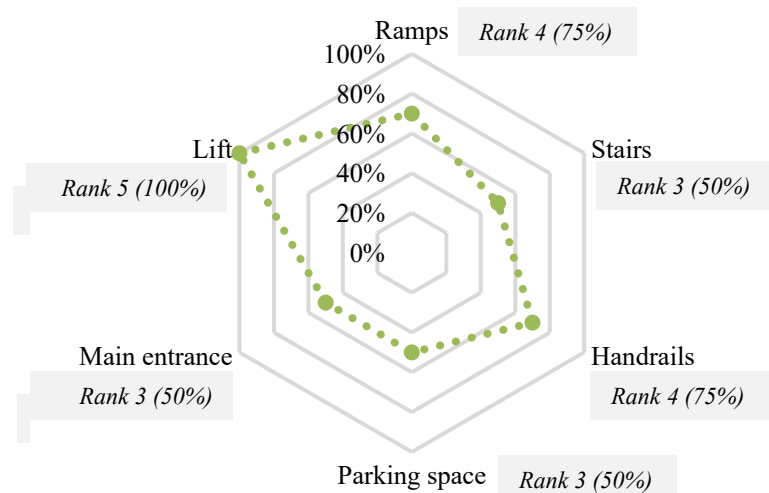
2- Partially met the requirement

3- All requirement met/ facility is provided but it is not necessary

Meanwhile, the Rank Matrix was used to evaluate and to summarise the compliance according to the required guideline, as in Table 4. Results on the level of accessibility in Figure 3 showed that three (3) design elements- the stair, parking space, and main entrance, had recorded the lowest compliance scores (Rank 3) compared to another two (2) elements- the ramps and handrails, which had recorded the second lowest compliance score (Rank 4). Meanwhile, the lift was recorded as the most compliant component of the study area based on its accessibility (Rank 5).

**Table 4:** Rank Matrix for Evaluation on Level of Accessibility Compliance for Selected Housing Design Elements.

Rank	Remark
1	Poor/ 0% all requirements are not met/ facility is not provided even though it is necessary
2	Satisfactory/ 25% of the requirements met
3	Fair/ 50% of the requirements met
4	Good/ 75% of the requirements met
5	Excellent/ 100% all requirements met



**Figure 3:** Rank Matrix on Level of Accessibility for Selected Housing Design Elements.

Regarding usability, six (6) evaluation indicators were used in a checklist during site observation, where a scale has been applied (Table 5). From



the results, it was found that the tread and riser of the stairs in the provided study area were accessible. However, the top and bottom of the stairs seemed to lack tactile surfaces. There is neither signage nor walkways directing visitors to the building; the only signage indicating the accessible areas was installed in the parking lot for the disabled user. The width of existing corridors in specified areas is frequently sufficient for the wheelchair users to pass through and turn. In addition, wheelchair users have access to the existing corridors. The lift is accessible due to the provision of an assistive lighting system. Additionally, the size of the lift holds enough space. It can be deduced that the equipped lift facilities do not cause unnecessary difficulty for the disabled. The existing ramps make it easier for the disabled users to enter and exit the building. Also, the slope of the ramp was ideal for use.

**Table 5:** Evaluation Criteria on Usability When Entering the Building (Housing Block)

Evaluation Criteria	Rank	Note
Are tread depth and riser height of stairs enough? Are there any tactile surfaces at the top and bottom of the stairs?	1.5	1: Yes/ There is no obstacle or deficiency to restrict accessibility
Are there any signage and wayfinding in places?	2	1.5: Medium / there are several obstacles or deficiencies to restricting accessibility
Is the width of corridors enough? Is there enough area for a wheelchair to pass and turn?	1.5	
Are there any assistive listening systems in elevators?	1	2: No/ There are obstacles or deficiencies in terms of accessibility
Are the width of lift enough for wheelchair?	1	
Are there any ramps to make passing easier? If exists, are their slopes appropriate?	1	

## CONCLUSION

The results of the study indicated that some obstacles and challenges must be addressed regarding universal design, specifically on accessibility and usability aspects. These issues were due to a lack of accessible housing design elements as well as the lack of understanding of the existing legislation and standards. Thus, the results have indicated that Malaysian developers need to be better informed regarding universal design and its benefits and issues that are connected with the adopting of the principle in the housing environment. Additionally, government initiatives and community awareness should be improvised to implement universal design elements in compliance with the related guidelines.

As this study examined the accessibility and usability of PWD's facilities by assessing the efficiency of regulations and standards, some recommendations may be considered in the future. Firstly, future studies on the related topic may use a quantitative or mixed method for data collection. In addition, the study may be focused on landed property in an urban area, and *Garis*

*Panduan Reka Bentuk* may be introduced to ensure accessibility for PWDs in raising their awareness. Expert interviews among the stakeholders such as the local government, policymakers, and developers may be approached as respondents for future research. Moreover, other design elements excluding these six (6) elements may be used as the focus of the study, which covers the inside of the housing unit such as access to the kitchen, access to the bathroom, and so on.

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## **LOCAL PERCEPTIONS TOWARDS THE ENVIRONMENTAL IMPACT OF TOURISM ON THE CHÀM ISLANDS, VIETNAM**

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### **Abstract**

Local perceptions have the most significant impact on the sustainable tourism practices in a region. This study used the Social Exchange Theory (SET) to examine how local perceptions towards the environmental costs and benefits affect their support for tourism development. The study involved 300 residents of the Chàm Islands. Two factors that affect local perceptions towards the environmental costs and benefits; namely, community concern and eco-centric attitudes; were assessed. Two factors were found to have a positive effect on the perceived environmental costs while community concern had influence on perceived environmental benefits. Local perceptions towards the environmental costs and benefits also had a positive and significant correlation with their support for tourism development. Therefore, the locals still support tourism development even though they believe the environmental costs outweigh its benefits. The government and tourism planners may use the findings to guide local perceptions towards the environmental impacts to develop sustainable practices.

**Keywords:** Locals perceptions, environmental benefits, environmental costs, support for tourism

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## INTRODUCTION

Tourism is often thought to have a positive effect on the economic and sociocultural aspects of the local community (Ouyang, Gursoy, & Chen, 2019; Latip, Jaafar, Marzuki, Roufechaei, & Umar, 2020; Latip, Jaafar, Marzuki, Roufechaei, & Umar *et al.*, 2020). However, the environmental sustainability of tourism development is often called into question (Latip, Rasoolimanesh, Jaafar, Marzuki, & Umar, 2018; Riengchantr, 2018; Bhat, Majumdar, & Mishra, 2020) as it often interferes with the preservation of pristine environments, particularly in highly vulnerable areas such as small islands (Burgin & Hardiman, 2015; McLeod, Dodds, & Butler, 2021).

Island tourism is a significant industry in Vietnam (Luan, 2015). As such, the Chàm Islands are one of the islands facing serious environmental issues due to an influx of tourists (Bourne, 2019; Vu, 2019). At the time of writing, at least 33 hectares of seaweed has been destroyed due to over-fishing and mass tourism (Thanh, 2019), marine species and fish shelters have been damaged by increased speed boat traffic and mass tourism (Vietnam News, 2018), the number of hard corals in tourism zones has decreased due to an increase in tourists (Quach, 2018), 102 hectares of forest have been cleared to construct roads and buildings for tourism and to collect plants as food for tourist (Thanh, 2019).

The primary purpose of the Cu Lao Chàm marine protected area (Chàm MPA) is to preserve habitats and species and improve local lives. The environmental protection initiatives of the Chàm MPA as well as its operations are funded by tourism revenue. Although the locals believe that tourism harms the environment as it causes marine damage and forest clearance, they do acknowledge the economic benefits and poverty reduction that tourism brings (Hoang, 2019; Thanh, 2019; Alisa, 2020; Tin *et al.*, 2020).

The cost-benefit approach is too simple and has limited predictive capabilities as it does not specify the impact of perceived aspects; such as economic, sociocultural, and environmental (Nunkoo & Ramkissoon, 2012; Styliadis & Terzidou, 2014). Furthermore, the number and scope of studies on the effect of local perceptions towards the environmental costs and benefits of tourism on local support of tourism is limited (Gursoy, Chi, & Dyer, 2010; Adongo, Choe, & Han, 2017). Most studies have examined the effect of local perception of the economic and socio-cultural costs and benefits of tourism (Kuvan & Akan, 2005; Boley, Strzelecka, & Woosnam, 2018). Furthermore, only a handful of studies have examined local perceptions towards the environmental costs and benefits of island tourism (Miyakuni, 2012; Martín, de los Salmenes Sanchez, & Herrero, 2018). Therefore, there is a need to examine the effect of local perceptions towards the environmental costs and benefits of tourism on local support of tourism development.

Although the locals of the Chàm Islands contend with tourism-related environmental deterioration (Alisa, 2020), little has been done to determine local

perceptions towards the environmental costs and benefits of tourism (Truong & Le, 2018). Therefore, this present study adopted the domain related costs-benefits approach of Stylidis, Biran, Sit, and Szivas (2014); which was derived from the social exchange theory (SET); to determine the extent to which the locals would support tourism development based on their perceptions of the environmental costs and benefits of tourism. The factors affecting these perceived environmental costs and benefits were also assessed.

### **LOCAL PERCEPTIONS TOWARDS THE ENVIRONMENTAL COSTS AND BENEFITS**

Perception is a part of the human cognitive process (Bonnes, Lee, & Bonaiuto, 2004) that is affected by experiences (Ismail, 2009). It can be defined as the understanding, awareness, and knowledge of individuals (Doxey, 1975). In the context of tourism, local perceptions of the impacts of tourism are crucial as they influence how the locals behave with tourists as well as their support of tourism development (Almeida-García, Peláez-Fernández, Balbuena-Vázquez, & Cortés-Macias, 2016). The perceived environmental costs and benefits is the manner in which the locals recognise positive or negative changes in the environment and its surroundings (Pham, 2011).

### **FACTORS AFFECTING THE PERCEIVED ENVIRONMENTAL COSTS AND BENEFITS**

#### ***i) Community concern***

Concerns are a state of fear of a certain problem. Community concern refers to concerns about local issues; such as the environment, schools, crime, and recreation; in the community (Gursoy, Jurowski, & Uysal, 2002; Gursoy *et al.*, 2010). The level of concern that locals have for each dimension of a community may affect their perception of the impacts of tourism (Gursoy *et al.*, 2002). In this present study, local concerns refer to the condition and quality of the environment, particular marine life, and forest biodiversity.

#### ***ii) Eco-centric attitudes***

Eco-centric attitudes are environmental attitudes that refer to “an individual’s values and norms about the correlation between human behaviours and the natural environment” (Gursoy, Ouyang, Nunkoo, & Wei, 2019, p. 315). It is also defined as “the strong belief in the preservation and protection of the environment” (Jurowski, Uysal, & Williams, 1997, p. 4). Locals who have eco-centric values are conservation-oriented and allocate resources to protect the environment (Gursoy *et al.*, 2019).

### **iii) Social Exchange Theory (SET)**

The SET is the most frequently used theoretical framework in studies on the impacts of tourism (Amuquandoh, 2010; Lee, 2013; Rasoolimanesh, Jaafar, Kock, & Ramayah, 2015; Gursoy *et al.*, 2019). It is a “general sociological theory for understanding the exchange of resources between individuals and groups in an interactive situation” (Ap, 1992, p. 66). The SET suggests that locals are more likely to enter into an exchange if the benefits of tourism for their community are valued. They are also more likely to support the tourism industry when the benefits of tourism exceed its costs (Gursoy *et al.*, 2010; Saad, Abdullah, & Rosman, 2020; Gannon, Rasoolimanesh, & Taheri, 2021). Local support plays a pivotal role in determining the sustainability and success of tourism development and can be determined by evaluating their perceptions of the environmental impacts (Amuquandoh, 2010; Lee, 2013).

## **THE THEORETICAL FRAMEWORK**

The theoretical framework of this present study was adapted from the studies of Jurowski *et al.* (1997), Gursoy *et al.* (2002), and Amuquandoh (2010) and applied with the SET. According to Jurowski *et al.* (1997), the perceived economic, social, and environmental impacts affect local support of tourism. However, the study did not consider the costs and benefits of each dimension. Meanwhile, the model that Gursoy *et al.* (2002) proposed suggests that the correlation between the perceived costs and benefits affects local support of tourism. However, both studies did not allow locals to express their own perceptions of the costs and benefits of specific aspects; such as economy, socio-culture, or environment. Therefore, this present study examined if the perceived environmental costs and benefits affect the level of local support of tourism development.

According to Gursoy *et al.* (2002) and Amuquandoh (2010), factors; such as community attachment, the state of the local economy, community concern, eco-centric attitudes, and the use of local resources; affect local perceptions. However, community attachment, the state of the local economy, and the use of local resources were not included in the framework of this present study. This present study also investigated how the correlation between the perceived environmental costs and benefits affects local support of tourism development. Figure 1 depicts the theoretical framework that was developed.

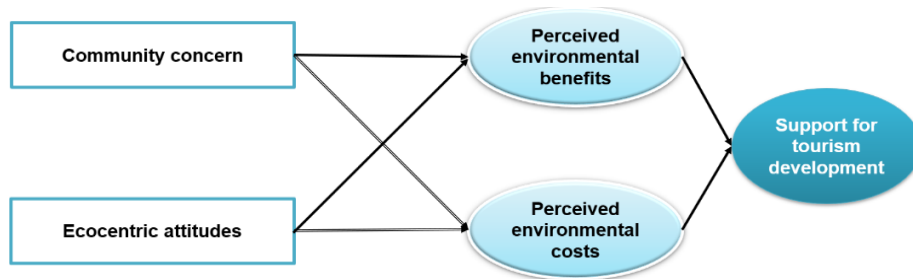


Figure 1: The theoretical framework

## RESEARCH METHODOLOGY

A survey questionnaire was used to quantitatively determine local perceptions of the environmental impacts of tourism. Considering the Covid-19 pandemic and the subsequent movement control orders, convenience sampling; which is a type of nonprobability sampling; was used to collect the data. All the respondents were selected depending on their ease of access and willingness to participate in the study. The data was collected in May 2021 and included 300 valid respondents who received the survey questionnaires via Facebook and Google Forms. A team of local enumerators were also on-site to collect paper-based responses.

The Chàm Islands are in the Central Vietnamese province of Quang Nam and consist of eight islands, of which Hon Lao is the largest island and home to four villages. This present study was only conducted in two of these villages; namely, Bai Lang and Bai Huong; as most of the residents of these two villages either worked in the tourism industry or its related amenities (Hoang, 2019; Alisa, 2020). Figure 2 shows the location of the Chàm Islands and the two villages.

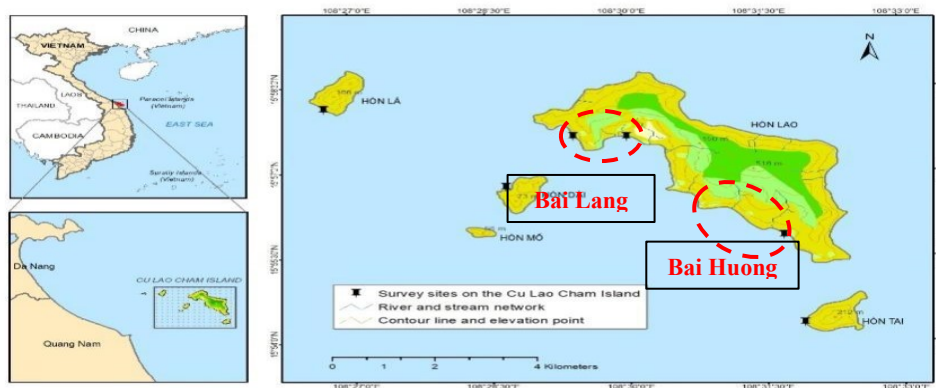


Figure 2: Location of the Chàm Islands.



The rich biodiversity of the islands includes both terrestrial and aquatic marine ecosystems; such as forests, mountains, coral reefs, seagrass beds, and fishing to name a few. At present, 1500 hectares of the islands is tropical forest with 6,700 hectares of sea that features a variety of flora and fauna. A total of 5175 hectares; which includes 165 hectares of coral reefs and 500 hectares of seagrass beds; falls under the purview of the MPA. The Chàm MPA is divided into five delineated zones and includes a tourism development zone (Trinh, 2014; Nguyen, Huynh, & Zhang, 2015; Quach, 2018; Bourne, 2019). Upon being recognised as a UNESCO site in 2009, tourism boomed on the Chàm Islands between 2012 to 2019 (Nam, 2020).

## RESULTS

### Demography

As seen in Table 1, the 300 respondents consisted of 154 males (51.3%) and 146 females (48.7%) that were aged between 18-60 years old. Approximately 34% of the respondents were 26-35 years old while 25.3% were aged 36-45 and 17.3% were 18-28. Most of the respondents had completed high school (36.7%) while 24% had a bachelor's degree and 22.7% had graduated secondary school. In terms of length of residency, 25% had lived on the Chàm Islands for 21-30 years, 26.3% had lived there for 31-40 years while 19% and 14% had lived there for 41-50 years or more than 51 years, respectively. According to the collected data, the minimum length of residency of all the respondents was one year or more, indicating that they had sufficient exposure to the negative effects of tourism on the environment.

**Table 1:** Demographic profiles of the respondents.

Demographic variable	Value	Percentage (%)
<b>Gender</b>	Male	51.3
	Female	48.7
<b>Age</b>	18-25 years old	17.3
	26-35 years old	34.0
	36-45 years old	25.3
	46-55 years old	16.7
	56 years old and older	6.7
<b>Education</b>	No formal education	1.3
	Primary school	9.7
	Secondary school	22.7
	High school	36.7
	Diploma/Certificate	4.7
	Bachelor's degree	24.0
	Master's degree	1.0

	PhD	0
<b>Length of residency</b>	1-10 years	3.0
	11-20 years	10.7
	21-30 years	27.0
	31-40 years	26.3
	41-50 years	19.0
	51 years and above	14.0

### Perceived environmental benefits

As seen in Table 2, most of the respondents agreed that tourism environmentally benefited the Chàm Islands. Most of the respondents stated that, to avoid using plastic and to protect the environment, many local businesses use bamboo straws and handmade paper packaging for tourists (M = 4.05). They also acknowledged that the entrance fees that organisations collect from tourists are then used to conserve natural resources (M=3.80). The respondents also reported being motivated to collect garbage and maintain a clean environment to attract more tourists to the islands (M = 3.87). However, few respondents stated that the locals participate in community-based teams to preventing illegal activities (M = 3.68).

**Table 2:** Descriptive analysis of the perceived environmental benefits.

No	Statements	M	SD
a	Organisations; such as Cu Lao Chàm MPA; charge tourists entrance fees then use the funds to conserve natural resources.	3.80	0.805
b	Local businesses use bamboo straws and handmade paper packaging for tourists instead of plastic to reduce environmental damage.	4.05	0.973
c	Some locals join community-based teams to prevent illegal activities and to preserve marine animals for tourism activities; such as diving and fishing.	3.68	0.920
d	Residents are motivated to collect garbage along the seashore to preserve a clean environment that would attract more tourists.	3.87	0.897

### Perceived environmental costs

As seen in Table 3, most of the respondents perceived the environmental costs of tourism on the Chàm Islands at a mean value of 3.66-3.90. The respondents agreed that the influx of tourists increased demand for seafood (M = 3.90). This was followed by an increase in the amount of waste produced as well as air, water, and soil pollution (M = 3.88), a reduction in the number of plant species (M = 3.82), and the overcrowding of public and leisure spaces (M = 3.67). Only the statement that tourism activities have damaged and decreased coral reef, seagrass, and seaweed had a moderate mean value (M = 3.66).

**Table 3:** Descriptive analysis of the perceived environmental costs.

No	Statements	M	SD
a	Tourism activities; such as anchoring boats, diving, and sea walking; have damaged and decreased the number of coral reefs, seagrass, and seaweed.	3.66	0.852
b	The influx of tourists has increased the demand for seafood; such as fish, shell, and shrimp; resulting in over-fishing.	3.90	0.846
c	The number of plant species are reducing as plants; such as vegetables and leaves; are harvested from the forest to cater to tourist demands.	3.82	0.759
d	The influx of tourists has increased the amount of waste produced as well as air, water, and soil pollution.	3.88	0.845
e	The influx of tourists has caused overcrowding in public and leisure spaces.	3.67	0.827
f	Forests have been cleared to build tourism infrastructure; such as roads, hotels, and resorts.	3.85	0.886

In summary, the respondents were very aware of both the environmental costs and benefits of tourism development. This implies that the respondents still acknowledge the environmental attributes of tourism.

### **Factors Affecting Local Perceptions of Environmental Costs and Benefits *Exploratory Factor Analysis (EFA)***

Items pertaining to community concern and eco-centric attitudes were analysed. The Cronbach's alpha ( $\alpha$ ) of all the items exceeded 0.7. An exploratory factor analysis (EFA) was then conducted using the varimax rotation method to reduce the items and identify the underlying dimensionality of the constructs. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.74, which was deemed acceptable as it exceeded the 0.6 minimum acceptable level while the results of the Bartlett's test of sphericity was significant ( $p=0.000$ ). Therefore, the results of both measures indicated that the data was appropriate for factor analysis.

The eigenvalues illustrated that the factors affecting the environmental costs and benefits involved two components. As the factor loading values of all the items exceeded 0.6, they were practical and none of the items were removed. The rotated solution revealed there no new factors were generated. The available factors accounted for 69% of the total variance, with Component 1 accounting for 40.6% and Component 2 for the remaining 28.3%. The findings of this present study were corroborated by that of multiple extant studies on the factors affecting local perceptions (Gursoy *et al.*, 2002; Amuquandoh, 2010; Miyakuni, 2012; Gursoy *et al.*, 2019; Sánchez-Fernández, Alvarez-Bassi, & Ramon-Cardona, 2019).

**Table 4:** Results of the exploratory factor analysis (EFA).

Independent variables	Factors loading	Eigenvalue	% of variance	Cronbach's alpha ( $\alpha$ )
<b>Factor 1: Community concern</b>				
How concerned are you by the loss of marine resources; such as seafood, coral reefs, and sea grass; that tourism has caused?	0.768			
How concerned are you by the deforestation that has occurred to construct infrastructure/facilities and to satisfy the increased demand for food that tourism has caused?	0.726	2.847	40.6%	0.816
How concerned are you by the litter and waste generated by the tourists?	0.702			
<b>Factor 2: Eco-centric attitudes</b>				
The natural resources of the Chàm Islands are limited and can disappear if they are caught and collected frequently.	0.643	1.986		
Plants and animals warrant as much preservation and protection as human life.	0.727		28.3%	0.822
The activities of the tourists and islanders affect nature.	0.611			
If marine resources and forests continue to be exploited for tourism activities, we will soon experience environmental problems.	0.656			

***Multiple regression analysis***

Multiple regression was performed to assess and explain the strength of the correlations between several independent variables and one dependent variable. As seen in Table 5, the coefficient of determination ( $R^2$ ) was 0.057. This indicates that the two independent variables; community concern and eco-centric attitude; explained 5.7% of the variance of the dependent variable; perceived environmental benefits. Community concern and eco-centric attitudes were able to significantly predict the perceived environmental benefits ( $p=0.000$ ). A positive and significant correlation was also observed between community concern and the perceived environmental benefits ( $\beta=0.202$ ,  $p=0.000$ ,  $<0.05$ ). This suggests that higher levels of community concern led to increased perception

of environmental benefits among the locals. However, the correlation between eco-centric attitudes and the perceived environmental benefits was insignificant ( $p=0.098$ ,  $>0.05$ ). Therefore, locals who have strong eco-centric attitudes and a sense of preservation will not perceive any environmental benefits from tourism.

**Table 5:** Multiple regression analysis results of the perceived environmental benefits of tourism.

Variables	Unstandardised Beta (B)	Std. Error	Standardised Coefficients Beta ( $\beta$ )	t	p
<b>Environmental benefits</b>					
Constant	2.919	0.263		11.568	0.000
Community concern	0.163	0.046	0.202	3.539	0.000
Eco-centric attitudes	0.093	0.054	0.098	1.716	0.087
Model summary: $R^2 = 0.057$ , F-value = 8.935, $p = 0.000$					

Based on Table 6, the two independent variables; community concern and eco-centric attitudes, explained 11% of the variance of the dependent variable; perceived environmental costs. All the factors had a significant correlation with the perceived environmental costs. The correlation between community concern and the perceived environmental costs of tourism was positive and significant ( $\beta=0.266$ ,  $p=0.000$ ,  $<0.05$ ). Therefore, when community concern increases, the locals will perceive that tourism harms the environment of the Chàm Islands. A significant correlation was observed between eco-centric attitudes and the perceived environmental costs ( $\beta=0.160$ ,  $p=0.004$ ,  $<0.05$ ). Therefore, the more eco-centric the attitudes of the locals, the more likely they are to perceive the environmental problems of tourism and changes in the environment of the Chàm Islands.

**Table 6:** Multiple regression analysis results of the perceived environmental costs of tourism.

Variables	Unstandardized Beta (B)	Std. Error	Standardized Coefficients Beta ( $\beta$ )	t	p
<b>Environmental costs</b>					
Constant	2,499	0.235		10.619	.000
Community concern	0.199	0.041	0.266	4.805	.000
Eco-centric attitudes	0.140	0.049	0.160	2.885	.004
Model summary: $r^2 = 0.11$ , F-value = 18.393, $p = 0.000$					

**Local support of tourism development**

The results were interpreted based on the mean score of local support of tourism. As seen in Table 7, the mean value of each statement ranged between 3.99-4.29, which indicates that most of the respondents strongly support the development of tourism in the Chàm Islands.

**Table 7:** Descriptive analysis of local support of tourism development.

No	Statements	M	SD
a	I would like more tourists to visit the Chàm Islands	4.01	0.860
b	I support tourism having a major economic role in the community	4.16	0.840
c	I support conservation of nature and environmental education for future tourism development	4.29	0.750
d	The government should put more effort into minimising the negative environmental impacts of tourism to support tourism development	4.27	0.749
e	I am willing to participate in the tourism planning and management of the Chàm Islands to support tourism development.	3.99	0.886

Multiple regression was conducted to identify the influence of the perceived environmental costs and benefits of tourism on local support for tourism development. As seen in Table 8, the perceived environmental costs and benefits explained 31.6% of the variance in the local support of tourism ( $F=70.070$ ,  $p<0.001$ ). Furthermore, a positive and significant correlation was observed between the perceived environmental benefits and local support of tourism development ( $b = 0.218$ ,  $p<0.001$ ). The correlation between the perceived environmental costs and local support for tourism development was also positive and significant ( $b=0.453$ ,  $p< 0.001$ ). In summary, the perceived environmental costs of tourism were more important in explaining local support of tourism development.

**Table 8:** Multiple regression analysis results of local support of tourism development.

Variables	B	Std. Error	Std. Beta	t-ratio	p
<b>Support of tourism development</b>					
Constant	1.541	0.223		6.924	0.000
Environmental benefits	0.190	0.044	0.218	4.266	0.000
Environmental costs	0.494	0.056	0.453	8.879	0.000
Model summary: $r^2 = 0.316$ , $F\text{-value} = 70.070$ , $p = 0.000$					

The results of this present study indicate that local perceptions of both the environmental costs and benefits had a positive and significant effect on their support of tourism development. It also showed that, even though they believe that the environmental costs outweigh the environmental benefits, they will continue to strongly support tourism development in the Chàm Islands. This was consistent with the findings of Schofield (2011), who concluded that the level of local support for tourism development remained high despite the perceived environmental costs. However, the findings of this present study as well as Schofield (2011) contradicted that of the SET, which showed that the level of support for tourism development only increased when the perceived benefits exceed the perceived costs (Gursoy *et al.*, 2002; Amuquandoh, 2010; Rasoolimanesh *et al.*, 2015). This may be due to differences in the context of tourism, stages of tourism development, and economic benefits that these all these studies examined (Pham & Kayat, 2011; Schofield, 2011). For instance, Pham and Kayat (2011) report that locals believe positive environmental impacts are more important than economic impacts. The low environmental knowledge of the locals may also be to blame (Nyaupane & Thapa, 2006).

## **CONCLUSION AND RECOMMENDATIONS**

Based on the findings of this present study, community concern and eco-centric attitudes were found to have a positive influence on the perceived environmental costs while community concern influenced the perceived environmental benefits. Furthermore, local perceptions towards environmental costs and benefits were found to have a positive and significant relationship with local support of tourism development.

This present study contributes to the existing body of literature on local perceptions of environmental costs and benefits as it confirms that factors; such as community concern and eco-centric attitudes; affect local support of tourism development. Multiple extant studies supported the SET and suggested that locals support and participate in tourism development only if the environmental benefits outweigh the environmental costs (Jurowski *et al.*, 1997; Gursoy *et al.*, 2002; Amuquandoh, 2010; Stylidis *et al.*, 2014). However, the findings of this present study contradict that of the SET from a theoretical perspective as it found that locals continue to strongly support tourism development even if they perceive that the environmental costs outweigh the environmental benefits. The results of this present study may vary from that of the SET and other extant studies due to the context of tourism on the Chàm Islands, the economic benefits, the promotion of tourism as an alternative source of livelihood, and a lack of environmental knowledge among the locals to perceive the long-term negative impacts of tourism.

The findings of this study also indicate that the government as well as tourism planners and policymakers should conduct meetings and campaigns that

guide local environmental perceptions to develop sustainable tourism practices. Tourism planners and policymakers should formulate plans and policies to mitigate the environmental costs. The local authorities should also limit the number of visitors to the Chàm Islands during peak tourism seasons.

A limitation of this present study was that it did not examine the effect of the perceived economic costs and benefits on local support of tourism development. Therefore, future studies should examine the impact of economy-related variables on local support of tourism according to the SET. Future studies could also use the SET, or combine it with other theories, to better understand local perceptions. This present study also did not examine the perception of environmental costs of other stakeholders; such as the local authorities, tourism managers, tourism agencies, and tourists. Therefore, future studies should investigate how their perceptions towards environmental changes affect their support of tourism development.

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## **DEVELOPMENT OF RURAL TOURISM IN PERAK TENGAH DISTRICT BASED ON LOCAL AUTHORITY PERSPECTIVES**

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### **Abstract**

Perak Tengah District has much cultural heritage potential to promote, notably in terms of village life, arts, culture, and agriculture. In order to be beneficial to the community, additional efforts should be encouraged to draw tourists to Perak, and the new attraction should be carefully defined and interpreted, especially in rural regions. Unfortunately, there is not enough support for the tourism industry's infrastructure, and the services are still not up to par. The Local Plan 2013, which promotes tourist-related products in Perak Tengah, is the foundation of the proposal to boost tourism there. This is consistent with the policies outlined in the Perak State Plan, which emphasises Perak Tengah's tourism products and integrated growth as a Perak tourism attraction. Focus group discussions with local agencies will be used in this study's qualitative research, which will be used to examine the rural development in the Perak Tengah District. The study begins by identifying the person in charge of change for each administrative area. This study is divided into five (5) main sections: the tourist destination, the tourist product, the tourist activities, the promotion of tourism, and the infrastructure for tourists, particularly in the administrative district. Based on the findings of this study, it was found that there are various potentials that local authorities can highlight. The suggestions and perceptions expressed that rural tourism can revive and improve the tourism economy in Perak Tengah.

***Keyword:*** Rural Tourism, Tourism Product, Local Authority, Perak Tengah District

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## **INTRODUCTION**

The tourist industry is one of Malaysia's most significant contributors to the country's gross domestic product (GDP), with numerous destinations in Malaysia, such as major cities, which have witnessed tremendous efforts to boost the tourism industry (Chiun, 2019). Apart from cities, rural tourism has the potential to be a good product for marketing the country and involving the community in the travel business, also revitalising the rural economy and, in particular, the development of a value-added commercial channel for local produce (Amir, Ghapar & Jamal 2015; Liu, 2006). In Malaysia, rural tourism helps the government increase job opportunities and eradicate poverty in the communities, assisting communities in generating income and economic booster for rural destinations (Amir et al., 2015; Chin, 2022). Furthermore, the majority of visitors who come to developing nations are usually interested in cultural or heritage-based tourism, as developing countries have plentiful and mainly unexploited natural and resource resources that supply the elements required for culture and heritage-based tourism (Chiun, 2019).

This study aims to develop a tourism product as attraction, accommodation, food and beverage, destination, activities, and ancillary services, which have been identified as attracting tourists and having a major impact on overall tourist expenditure in previous studies (Chiun, 2019). According to Isa (2020), every improvement or modification that is to be done towards any of the city elements must undergo a proper channel and adhere to improvement or modification steps that design experts have proposed to create harmony between the city elements with their surroundings and further will be able to form an image that has identity, structure and meaning. Other subsystems, such as infrastructure, health, education, and the environment, should not be neglected. This is in line with the objective of the National Key Result Areas (NKRA) of rural revitalization and to decrease the migration of rural youth from rural areas (Harun & Mat Zin, 2018) as specified in the government's strategic strategy through the recognition of potential tourism products to be promoted (Amir et al., 2015). Rural tourism encompasses several critical factors related to nature, heritage, community traditions, and traditional customs that can be found in rural places with a small population. Rural tourism is a complimentary option to traditional economic activities such as agriculture, farming, and other significant sectors in some places, in terms of diversity of activities. Also, the diversity of rural cultures between countries creates opportunities for appealing and competitive tourism products (Mapjabil, Sipatau & Rahman, 2020). The products might maximize asset utilisation to benefit the community involved (Taufik et al., 2021).

### **Rural Tourism at Perak Tengah District**

The cluster was designed in accordance with tourism clusters by Perak State Plan 2040 Gopeng – Kampar – Batu Gajah cluster is the nearest to Perak Tengah District. Based on geography, visitors can easily explore tourism products in Perak Tengah because it is located on a route that can be linked to nearby cities and tourist attractions such as Parit - Seri Iskandar – Kampung Gajah – Pasir Salak. Unfortunately, these attractions are not well-publicised and inadequate support for tourism infrastructure and services is still unsatisfactory (Harun,2018).

The proposal to strengthen tourism in Perak Tengah is based on the Local Plan 2013, promoting tourism products in Perak Tengah (Harun,2018). This is in line with Perak State’s Plan strategies of preserving heritage assets and integrated development as a Perak tourism attraction emphasising the products tourism of Perak Tengah such as Rumah Dato Maharajalela, Kompleks Sejarah Pasir Salak, Batu Peringatan J.W.W Birch, Pasir Salak and Masjid Pasir Salak (PLANMalaysia, 2019). However, in Official websites of Tourism Perak only promoted Pasir Salak Historical Complex as a heritage tourism product but left out other Perak Tengah tourism products comprehensively (Tourism Perak, 2022).

**Table 1:** Type of tourism and products in Perak Tengah

Type of tourism	Tourism Products	Unit/No
<b>Heritage</b>	i. Museum	24
	ii. Royal Tomb	
	iii. Handicraft	
	iv. Place	
<b>Agriculture</b>	v. Agriculture products	3
<b>Eco-Tourism</b>	vi. Preservation and conservation	2
<b>Education</b>	vii. Local Universities	42
	viii. Private Universities	
	ix. Schools	
<b>Services</b>	x. Food and Beverages	184
	xi. Shopping	
	xii. Accommodation	
	xiii. Bank and Finance	
<b>Recreation</b>	xiv. Sports	4
<b>Total</b>		<b>259</b>

*Source: Author,2022*

## **LITERATURE REVIEW**

### **Rural Tourism Products**

The scope of tourism promoted in rural areas is vast and varied in nature. The World Tourism Organization (UNWTO) defines product tourism as a combination of tangible and intangible elements such as natural, cultural, and artificial resources, facilities, services, and activities centred on a specific point of interest that forms the core of the destination marketing mix and creates an overall visitor experience, including emotional aspects (Vengesai, 2003). Rural tourism incorporates local products and cultural elements into tourism (Lane, 2009; Liu, 2006), which resulting multifaceted activity that includes farm-based tourism, eco-tourism and heritage tourism refer to Figure 1 (Chiun, 2019; Mapjabil et al., 2020; Nair, Munikrishnan, Rajaratnam et al., 2015).

Heritage tourism is leisure travel with the primary goal of visiting places and activities associated with the past (Harun, 2018; Lane, 2009). Some areas include educational travel, arts, and ethnic tourism (Lane, 2009). Then, eco-tourism is visiting natural regions to appreciate the landscape, including plant and animal biodiversity. Nature-based tourism can be passive, in which visitors merely observe nature, or active, in which visitors participate in outdoor recreation or adventure travel activities. Rural tourism has developed as a worthwhile alternative to agriculture in rural areas (Fleischer & Tchetchik, 2005). Agritourism refers to going to a functioning farm or other agricultural, horticultural, or agribusiness activity for enjoyment, education, or active participation in the farm's or operation's activities. (Chiun, 2019; Fleischer & Tchetchik, 2005; Lane, 2009). In Malaysia, homestay programmes are also one of the rural tourism which tourists are accommodated in a village with a local family, allowing them to learn about the local lifestyle, culture, and natural environment (Chiun, 2019; Muslim, Numata, & Yahya, 2017; Nair et al., 2015).

Furthermore, rural tourism can be promoted locally with the help of local government and local firms, and it is not always dependent on outside organisations or businesses. Although tourism can be costly to establish in some circumstances, such as resorts or when huge companies and franchises are involved, rural tourism can be promoted with minimal credit, training, or capital. As a result, rural tourism may be less expensive to develop compared to other economic development initiatives. Tourists benefit from two categories of small companies in rural areas: (1) those that are actively involved in tourism, such as hotels or attractions, and (2) those that are indirectly linked, such as retail and shopping. (Che Aziz, Hashim & Awang, 2018; Wilson, Fesenmaier, & Van et al, 2001)

### **Key Factors of Rural Tourism**

Attraction and uniqueness, whether natural or man-made elements both within and adjacent to a community, are the first critical criteria for the success of rural tourism (Che Aziz et al., 2018; Chiun, 2019; Wilson et al., 2001). According to research, there is a potential to create unique experiences and highlight the essential components of the destination's culture, history, and local way of life that distinguish it from the rest of the tourism world (Che Aziz et al., 2018). Visitors' senses will be stimulated by cultural events, resulting in amusing and informative experiences (Che Aziz et al., 2018).

Secondly, the development of tourism infrastructures such as access facilities and transportation, which are roads, airports, trains, and buses, water and power services, parking, signs, and recreation facilities (Wilson et al., 2001). Chiun (2019) emphasised success factors for rural tourism accessibilities. Rural locations far from urban areas are referred to as location features (Mapjabil et al., 2020). Road and transportation infrastructure enables access to tourism sites, boosts regional business activity, and benefits the local community by strengthening accessibility of existing tourism activities, attracting new tourists and promoting new tourism (Kanwal, Rasheed, Pitafi et al., 2020). Infrastructure is a necessary component of any tourism development. We may increase destination accessibility and qualities by constructing infrastructure favouring destination marketing and recommendations. Increased tourist intake to rural tourism results from infrastructure development (Kumar, Valeri & Shekhar., 2022; Wilson et al., 2001).

Services as a second input driver concern this because the attraction itself does not always draw tourists, even though the destination provides a focal point for many tourist activities and is vital for tourist locations competing for tourist expenditure (Giambona & Grassini, 2020; Naidoo & Ramseook-munhurrin, 2011). Otherwise, support facilities should be developed not just for residents but also for visitors/tourists' benefit. Due to limited access to these facilities, most of the tourists also stressed the significance of developing public facilities such as restrooms, shower rooms, and prayer rooms in rural tourism attractions. They believed that if appropriate facilities could be developed and managed, the number of tourists would rise, which would support the growth of rural tourism. (Che Aziz et al., 2018). Others, services such as lodging, restaurants, and the various retail businesses needed to take care of tourists' needs. Food services are required in rural areas to serve the tourists.

Rural tourism recognises that environmental conditions are critical to the industry's success. Everywhere, people are aware that they must be environmentally responsible and vigilant. Cleanliness, and nature preservation, like maintaining authenticity and diversity, must be as unique as possible. The concept of resilience brings a unique and contemporary perspective to the



approach to sustainable development. It focuses on existing vulnerabilities and immediate threats to social and environmental norms that are considered acceptable (Che Aziz et al., 2018; Chiun, 2019; Wilson et al., 2001)

Other than that, promoting and marketing tourism attractions to potential tourists (Chiun, 2019; Wilson et al., 2001). In marketing tourism destinations, the use of tourist information boards has grown significantly. The planning and inspiration stages of the consumer journey are of utmost importance, and tourist marketers strive to engage clients at pertinent touch points (Gross & Huber, 2020). Else, the importance of innovation and technology in service sectors, promotion, and marketing. Innovation in tourism has increased in the last few years, and it is important to highlight the awareness of innovation of technologies (Amir, Dura, Yusof et al., 2020), especially in the rural tourism industry. Rural locations are becoming increasingly popular among urban inhabitants, and promoting rural destinations is in desperate need of improvement and the urge to implement smart tourism (Che Aziz et al., 2018).

## **METHODOLOGY**

This study will be using qualitative research by using focus group discussions with the local agencies and focusing on the rural development in Perak Tengah District. The study establishes a stakeholder by identifying the person in charge of each administrative area. The stakeholder groups were: Chief/Head of the Mukim ten (10) and Tourism Agencies three (3). Each interviewee was assigned an alphanumeric code (R1 to R13) for credentials; the interviewee's information is shown in Table 2. The selection of the respondents for the focus group discussion was by purposive sampling and the best position to provide the information required. The method describes as “an interactive discussion between six to eight pre-selected participants typically but can be anywhere between five and above depending on the purpose of the study, and led by a trained moderator and converging on the specific issues that have been outlined (Hennink, Hutter & Bailey, 2011). Several attempts were made to contact each of these individuals via telephone and email. In the end, thirteen key informants above agreed to participate in the focus group discussion, which was conducted face to face at Dewan Cempaka 1, D’ Hotel Seri Iskandar, on 12<sup>th</sup> September 2022. The meeting starts with explaining the site background and initial findings to the participants. The questionnaire was open-ended in order to gain spontaneous opinions and avoid potential bias. The discussion was conducted in an informal situation by written notes and researchers' key points in paper and map assistance. The study focuses on the diversity of the stakeholder groups based on their understanding and perceptions of their administration areas. The questionnaire framework was divided into five (5) parts. Part A consists of eight questions about the tourism destination; Part B consists of two questions about tourism products; Part C

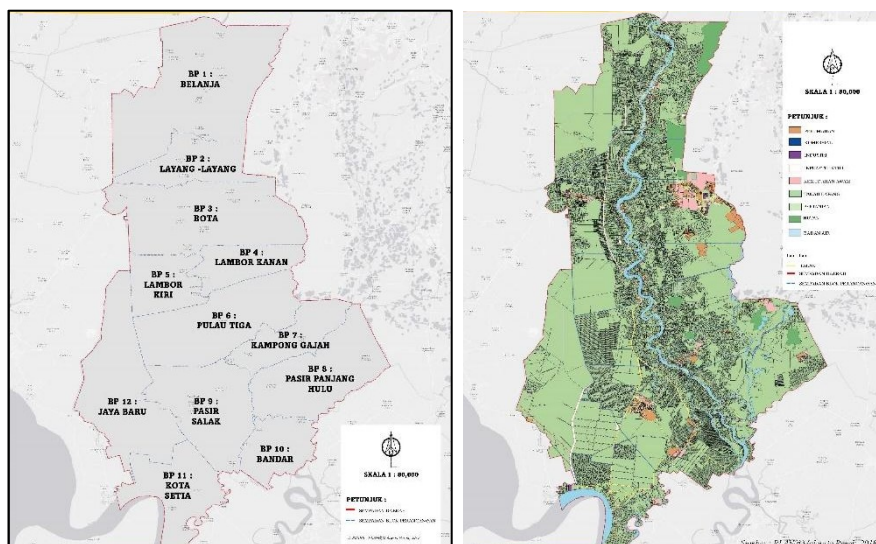
contains two questions about tourism activities; Part D covers five questions about tourism promotion. Part E entails two questions of accessibility and infrastructure in their administrative area.

**Table 2: Interviewees' Information**

Interviewees	Interviewees' Position / Agencies
R1	Penghulu Tertinggi
R2	Kementerian Pelancongan dan Kebudayaan Malaysia Negeri Perak
R3	Penghulu Mukim Belanja
R4	Tourism@Perak
R5	Penghulu Mukim Bota
R6	Jabatan Perancangan Bandar dan Pembangunan, Majlis Daerah Perak Tengah
R7	Penghulu Mukim Layang-Layang
R8	Penghulu Mukim Kampong Gajah
R9	Penghulu Mukim Pulau Tiga
R10	Penghulu Mukim Pasir Panjang Ulu
R11	Penghulu Mukim Pasir Salak
R12	Penghulu Kanan
R13	Penghulu Mukim Kota Setia

### Study Area

Perak Tengah District has many products with tourist potential that can be converted into rural tourism. The Perak Tengah District Local Plan 2013 proposes methods to strengthen and utilise all tourism potentials in the rural area, mainly historical and farm-based activities (Perak Tengah District Councils, 2018). The plan also specifies that all tourism activities must be accompanied by sufficient infrastructure to benefit visitors. For this study, the feedback from all representatives based on the administrative block planning Perak Tengah was considered (Figure 2). The key idea for tourism strengthening in the Plan is to promote contemporary cultural resources, promote the Pasir Salak Historical Complex, promote handicraft industries, and develop royal tombs as tourist attractions. According to a recent study by Harun (2018), there are numerous potential attractions in the district that each have their own identity and are positioned along a route that can be linked to allow visitors to explore the area easily. Unfortunately, these attractions are not well-publicized and do not have adequate on-site support. In Perak Tengah District, the research area includes three types of tourism based on rural tourism products: agritourism, eco-tourism, and heritage tourism. All of these should be prioritised for promotion as new tourism products.



**Figure 2:** Development Block and Land Use of Perak Tengah District.  
 Source: PLAN@Malaysia Perak, 2019

## RESULT AND DISCUSSION

The study established thirteen (13) stakeholders for discussing Rural Tourism Development in Perak Tengah District. An interesting outcome relating to the tourism development in Perak Tengah requires further explanation and identification. For example, on main tourism and products, one of the respondents specify;

*“In Bota, there are tombs of Sultans such as Sultan Muzaffar Shah 1 and 3, Sultan Alauddin as well as a cultural village, Pulau Misa, an indigenous village and many traditional Kutai or Limas houses, as well as a tuntung conservation centre. Every Saturday, a morning market attracts visitors from outside, such as Batu Gajah and Manjung. In addition, Dataran Sungai Seluang, close to UiTM Seri Iskandar, Taman Tasik Iskandar, near the MDPT office, and in terms of food, there is Bubur Perak, which serves 12 types of porridge, including Mee Ali, a special dish at Bota, and Sate Bota”. (R5)*

Meanwhile, on the aspect of a potential location, one of the interesting findings from this study stated;

*“Ikan Sangkar Jamil or Jamil Agrofarm in Kampung Tengah. A little far from Pekan Parit. This is a farmed cage fish product. This is the speciality of Sungai Perak because there are many cage fish farmers; if developed, it can also become a centre of attraction and atmosphere that visitors can enjoy. Others include accommodation, Lanai Cempaka Sari and in addition RISDA Homestay. This RISDA homestay is under the RISDA cooperation, a suitable place in terms of cleanliness and for tourism”. (R3)*

Additional to the above statement, one of the respondents mention the potential products;

*“Sungai Perak and Paddy fields are the main tourism products that should be promoted. The length of Sungai Perak is 92 km, from Mukim Belanja to Mukim Kampung Gajah. However, there are not many activities that have an impact on tourism. Such fishing and boat tours use small boats. Second, paddy fields. Paddy fields could be potentially developed as agrotourism or Sukan Bendang. It's such sports activities that are popular in Hulu Perak. We could draft a tourism calendar and put it as our new signature events”. (R1)*

With these perspectives, the promotion method should be reviewed as stated;

*“Most operators use social media such as Facebook and Instagram, and the best promotion is word of mouth (mulut ke mulut). For example, if parents indirectly send their children to educational institutions, they will go shopping. Tourism products enable them to travel in the surrounding area. They will tell others if the place provides a different satisfaction/experience. That is important for us to provide good service, good hospitality, and good products. It will make repeat tourism”. (R4)*

*“Among the biggest efforts that have been made, we sent or introduced this product at prestigious events, competitions, or exhibitions such as at MAHA (Doosoon@ Farm) and Pulau Misa to participate in Cultural Competitions up to the international level. Pulau Misa group has represented Malaysia to participate in the competition in Dubai”. (R5)*

Following the justification from above, the final effort by authorities for promotions must be considered as stated;

*“At the local authorities, MDPT, there is a tourism unit. These units discussed tourism management matters and tourism products*

*shortcomings, and the direction to develop the tourism area. Tourism cannot stand alone; it requires collaborative planning. It will also require support from all agencies, products, MOTAC, Tourism@Perak and other technical departments. It requires data on tourism products such as food, handicrafts, etc. Otherwise, the business operators also need to cooperate to make a successful tourism destination". (R4)*

*"The entrepreneurs themselves will promote each product; however, there are also initiatives from agencies to promote products. For example, MDPT tries to collect the highlighted tourism products to be included in FUN MAP through caricature drawing (comic) in collaboration with artists. This effort shows local authorities' commitment to developing Perak Tengah as one of the tourism destinations in Perak. Else, promoted in Media Social and official Website of Perak Tengah District Councils". (R6)*

Table 3 below shows each administrative and local agency's responses to Rural Tourism Development in Perak Tengah District. The statements show that every one of them has a different perspective on the strength and weaknesses of their administrative areas.

**Table 3:** Responses on Rural Tourism Development in Perak Tengah District.

Summary	Respondent
In conclusion, Perak Tengah has equal qualities to be promoted as rural tourism. This is because Perak Tengah includes several key factors related to nature, heritage, community traditions, and traditional customs that can be found in rural places. Tourism in Perak Tengah has many strengths, such as heritages, eco-tourism, recreation, and agrotourism. These strengths can be seen within 11 Mukim in Perak Tengah exempted Mukim Jaya Baru. However, several Mukims do not have main tourism destinations such as Mukim Layang – Layang and Mukim Pasir Panjang Hulu.	R1 R3 R5 R6 R7 R8 R9 R10 R11
Heritage elements can be found in every mukim except Mukim Layang – Layang. Heritage's elements can be categorised as buildings such as Menara Jam Parit, Rumah Kutai, Kompleks Pasir Salak, Replica house of Dato' Maharaja Lela and Laman Budaya Amphitheatre and royal tombs. Other than that, handicrafts such as Labu Tampil, Orang Asli handicraft and Aznah Songket. Some are intangible, such as food and cultural activities.	R5 R6 R9 R11
Regarding eco-tourism, Pusat Konservasi Tuntung is a tourism destination in Perak Tengah. Government agencies have made many efforts to ensure the rare species of Tuntung survive.	R5 R6

<p>Furthermore, Agro tourism is a significant type of tourism in Perak Tengah as most of the mukim have paddy fields and Sungai Perak. The most highlighted agro-tourism is cage fish farming, especially in Mukim Belanja (Ikan Sangkar Jamil) and Mukim Pulau Tiga (Pulau Tiga MYKP), Mukim Kota Setia (Ternakan Udang Galah). Other activities include chicken farming (Dosoan Sara Farm Ayam) and rabbits (MAWI Rabbit Farm). These generate local incomes and potentially highlight tourism in Perak Tengah.</p>	<p>R3 R9 R10</p>
<p>Next, Perak Tengah has sports and recreation activities known in Kampung Gajah. Litar Dato' Sagor is highlighted for motorsports activities. Else, outdoor sport hiking activities in Bukit Tunggul, Mukim Kampung Gajah.</p>	<p>R8</p>
<p>Other than that, some potential locations are only discovered by the local community and not promoted by authorities and tourism players. Some places have a good response from tourists even though it has not been highlighted by any tourism agencies, such as Ikan Sangkar Jamil in Mukim Belanja, Boat Fishing activities in Mukim Bandar and Mukim Kota Setia. It seems underrated as the authorities and tourism agencies only focus on existing products. In addition, some industry players do not show interest in making the royal tombs become one tourism product as they are irrelevant and unprofitable. Meanwhile, Laman Budaya Amphitheatre is abandoned without any planning.</p>	<p>R1 R2 R3 R4 R5 R6 R11 R12</p>
<p>Besides that, the activities to boost tourism in Perak Tengah are very low. There are no signature events such as festivals, sports tournaments, or annual activities. Sungai Perak and Paddy fields are the main tourism products that should be promoted. Paddy fields could be potentially developed for annual events such as Sukan Bendang. Meanwhile, boat touring and fishing activities should be encouraged for river activities in Sungai Perak. Other cultural activities such as Pertandingan Rebana in Mukim Pasir Salak. The activities and events could support tourism in Perak Tengah, especially at Mukim, which had fewer tourism products.</p>	<p>R2 R3 R4 R8 R10 R11</p>
<p>From the discussion, tourism products are the strength of mukim, which do not have tourism destinations such as Mukim Layang-Layang and Mukim Pasir Panjang Hulu. Some Mukim in Perak Tengah, which do not have many tourism destinations, have several tourism products such as SME which generate local incomes. Some of these products have a good market within state level, national level and internationally.</p>	<p>R7 R8 R9 R12 R13</p>
<p>Regarding tourism promotion, most of the products are promoted by the operator. The most popular platforms are by using social media such as Facebook and Instagram.</p>	<p>R1 R4 R5 R6 R7</p>

<p>Others, promotion from word of mouth. However, this promotion is only for those who have experience going to Perak Tengah.</p> <p>In addition, efforts from local authorities and agencies brought the tourism products in the prestige exhibitions such as at MAHA (Doosoon@Farm) and Pulau Misa to participate in Cultural Competitions and represented Malaysia to participate in the competition in Dubai. Yet, the promotion responses are still unsatisfactory as it only gives impact in certain products. Collaboration between agencies is essential.</p> <p>Some products are not ready to be mass promotions as they cannot make an effort to commit to supply and demand. This is because of financial problems and insufficient raw materials, especially for rare products such as Teh Berembang, popularised in Mukim Kota Setia, and Buah Kanta in Kampung Gajah.</p>	<p>R8 R9 R10 R11</p>
<p>Lastly, the adequacy of support facilities and infrastructures. Some tourism destinations such as Parit Town have a problem managing the parking areas because of the scarcity of land.</p> <p>Others, accessibility for Pulau Misa in Mukim Lambor Kiri, is built on private property, and some do not have a proper entrance or facilities. This will require time and cost to develop infrastructure and facilities such as roads including public toilets, water, and electricity supply</p> <p>Else, the availability of signages. This is because some of the products are not usually located in the main road areas, particularly for accommodation, agrotourism and food and beverage, mainly in Mukim Pulau Tiga and Mukim Pasir Panjang Hulu.</p> <p>In addition, the problems are highlighted for river activities. The main issues are the security management for tourism is problematic, especially for visitor safety, as some of the operators may have problems in terms of licence and management. Otherwise, many river activities do not have enough facilities such as jetty and accessibility, such as in Mukim Bandar, Mukim Pasir Panjang Hulu and Mukim Kota Setia.</p>	<p>R1 R3 R6 R7 R9 R11 R10 R12 R13</p>
<p>VR is a trend and innovative technology for promotions and marketing tools. However, VR could only show as a video with some information for the public to imagine or visualise the tourism products. However, the argument of content and information needs to be formatted as a promotion which does not swiftly change to virtual tourism. This is because tourism's nature is to experience and present it physically.</p>	<p>R1 R4 R5 R7 R9 R10 R11</p>

The urges for the public to come and visit physically for legit experiences and feels directly of the tourism products. Indirectly, could generate incomes for locals for tourists to spend in terms of food and beverages, accommodations, trade, and services. Moreover, VR may be trendy among young people or millennials, and age gaps may affect the preference of VR in tourism.	
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*Source: Focus Group Discussion (2022)*

## CONCLUSION

This study began by understanding the fundamental tourism and the operational method in Perak Tengah with the stakeholders involved. Based on the findings, the study concludes that there is much potential in every part of Perak Tengah. Each part of mukim has its uniqueness and attraction. It is a matter of how this product can be enhanced to its full potential. The different concerns of the stakeholders may be explained through their dependency on the activities and development. The agency should further explore collaborative impact assessment on the tourism involved for the improvement and tourism economy development.

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## **DO URBAN SPRAWL AND SPATIAL PLANNING STRATEGIES AFFECT RURAL SETTLEMENT AND RURAL BOUNDARIES IN PENANG?**

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DEPARTMENT OF TOWN AND COUNTRY PLANNING

### **Abstract**

The growing population and demand for urbanisation have led to pressure on rural areas and the natural environment. The crucial issue is protecting the rural area boundaries, which are essential for food security and traditional rural settlements. As urbanisation progresses due to the demand for development and population, the rural settlements and boundaries should be protected to ensure the sustainability of the resources for the population. The categorisation of land use data is inconsistent and poses several insufficient representations of rural boundaries in Penang. The main objective of this study is to compare the changes in rural boundaries in Penang in 2019 and the mapping of urban areas based on several data. The content analysis was used to compare and triangulate the data to be used for spatial analysis. The findings showed that the most prominent type of village is the traditional village, which accounted for 88%. Based on Penang's development priority areas (DPA) until 2030, 20133.83 acres of village or 52.92%. The village boundaries in Seberang Perai Utara District will be substantially affected, with an area of 7968.89 acres (20.95%). The implication of this study is that the protection of traditional villages and fishing villages requires attention given that most affected areas are traditional villages in Penang due to the development direction, with a total area of 18060.61 acres (47.47%).

**Keyword:** Urban sprawl, rural boundaries, rural settlement, spatial planning strategies and Penang

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## **INTRODUCTION**

Rapid urbanisation often causes pressure on rural areas and the natural environment. Worldwide urbanisation has resulted in a significant increase in urban population from 751 million in 1950 to 7.7 billion in 2019, with a predicted increase to 9.7 billion by 2050 (United Nations, 2019). According to PLANMalaysia (2016), urbanisation is a transformation and application process of urban features to a specific area. This process comprises the migration of rural inhabitants to urban setting conditions, resulting in changes in social and economic activity, values and cultures (Othman, 2021). Urbanisation has led to the changing nature of rural areas and peri-urban areas in terms of changes in land uses that are commonly used for agriculture, natural resources and rural settlements. The most significant repercussion of urbanisation is urban sprawl. In general, rural areas are synonymous with unplanned, unregulated and uncoordinated growth of low density. It is distinguished by self-sustaining infinite outward growth in the forms of leapfrog, radial and ribbon development. It is frequently used derogatorily because of the negative externalities connected with the term “sprawl”. Sprawl differs from urban expansion in that it is an unsustainable type of urbanisation (Sudhir Kumar, 2018).

In the context of Malaysian urban development, the urbanisation process is a crucial challenge in attaining the country’s aspirations to become a developed country. Malaysia, similar to the Asia-Pacific region, has witnessed significant urbanisation as a result of economic development, industrialisation, major migrations and a natural growing population (Mohammed et al., 2016). According to study, states that are robust and engaged in economic development would inevitably feel the pressure of the urbanisation process. According to DOSM (2021), Penang dominated the 2021 GDP performance with a 6.8 percent increase, followed by Selangor (5.0 percent), Terengganu (5.0 percent), Perak (3.5 percent) and Kedah (3.5 percent) (3.2 percent). The detrimental consequence of urban sprawl is the impact on rural areas and settlements in Penang. According to Tew et al. (2019), Penang’s urban area grew from 379.20 km<sup>2</sup> in 2004 to 453.06 km<sup>2</sup> in 2018, at a rate of 5.28 km<sup>2</sup>/year on the average. Based on the findings of the study, urban sprawl is an annual event and will continue to grow, thereby significantly affecting rural settlements and their boundaries. This situation is not novel, where Penang State’s districts (Seberang Perai Tengah and Seberang Perai Selatan on the mainland, and Barat Daya on the island) have experienced sprawl growth as a result of rapid urbanisation since the late 1980s (Osman et al., 2017). As a result, every policy and development planning direction implemented by the state will inevitably influence the physical changes in the built environment within the territory under its jurisdiction. This study aims to investigate the changes in rural settlements and their boundaries and Penang spatial planning policy outlook.

## **FACTORS OF URBAN SPRAWL**

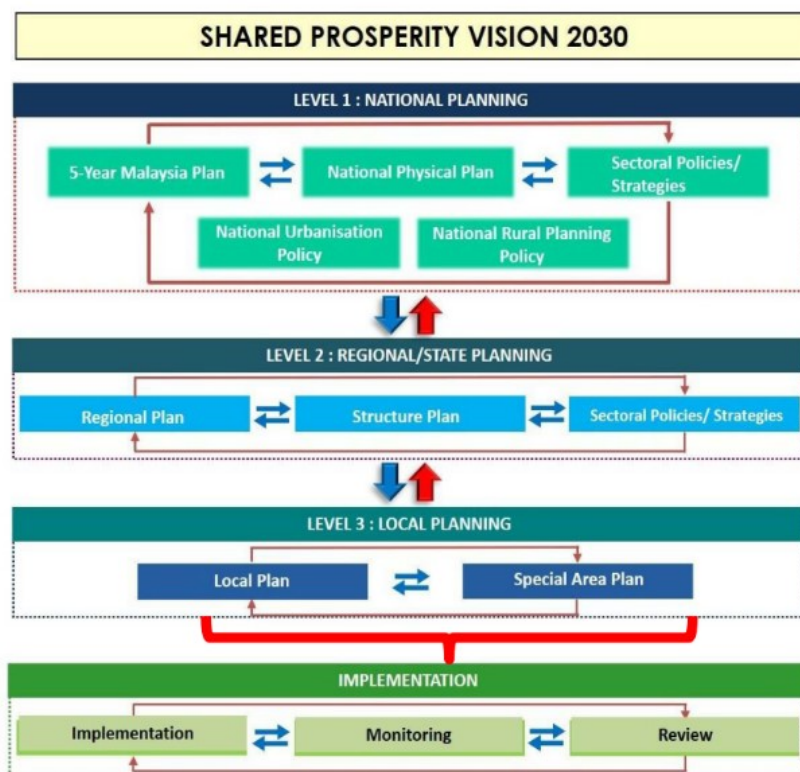
According to Karakayaci (2016), the territories of urban sprawl, which are defined as areas that have lost their rural features but cannot be classified as urban, have unique ambiguities that result in various difficulties, such as unplanned urban expansion and non-agricultural exploitation. As a result, urban sprawl might be characterised as a buffer zone between rural and urban regions. Gordon and Richardson (1997) characterised urban sprawl as leapfrog development, and DiLorenzo (2000) defined it as cancer or virus-induced expansion. Wilson et al. (2003) and Galster et al. (2001) argued that describing rather than defining would be more appropriate in the case of urban sprawl.

Therefore, in the context of Malaysian development, Yin et al. (2022) claimed that Malaysia undertakes diverse land-use allocation and conversion in the city centre, resulting in leapfrogging urban development to the suburbs. This phenomenon has resulted in changes in land use/land cover in built-up areas, which have begun to expand on agriculture and forest areas in peri-urban areas. Changes in land use/cover have beneficial and negative effects on a region. The expansion of a built-up area is assumed to result in greater economic growth and job opportunities in a region. This trend has become a substantial risk to environmental deterioration, traffic congestion and overpopulation. As a result, changes in land use and cover must be carefully planned and monitored (Samat et al., 2020).

According to Yasin et al. (2021), the condition of urban sprawl differs widely, with a distinct sequence in each city, state and country. Thus, the drivers, pressures and dynamics of urban sprawl are undoubtedly diverse. The driving forces of urban sprawl are described in its urban features, which are derived from their preceding academic literature, are socioeconomic, institutional, demographic, market and technology. In addition, Sudhir Kumar (2018) stated that the major causes of urban sprawl in his comparative study of developing and developed world cities can be grouped into 10 causes, namely, population growth, uneven/regional disparities in development, economic growth, transportation, government policies, affordable housing, speculation, consumption of black money, credit/loan facility and the nuclear family. Specific findings of this study include rapid urbanisation, unequal development, affordable housing, income/employment opportunities, inadequate infrastructure, unplanned or poorly planned urban expansion and poor execution of developmental plans; they are the major causes of urban sprawl in the developing world. The planning process is unable to anticipate the future because challenges caused by increasing urbanisation restrict the planning exercise to primary crisis management. In a nutshell, government policy is the primary driving force behind the emergence of urban sprawl. Failures in planning and policy direction in development plans may greatly affect the issue of urban sprawl, as we become closer to being developed nations and achieving sustainable development.

## **MALAYSIAN DEVELOPMENT PLANNING FRAMEWORK**

Act 172 is an act that enters into force for peninsular Malaysia and serves as the foundation of urban planning policy and legislation in Malaysia at present since the year 1976. The planning system is also arranged hierarchically amongst the federal government, state government and local authorities to attain sustainable development goals. According to Town and Country Planning Act 1976 (Act 172) Part 2, subsection 2A(2) (a) enshrined a formation of the National Physical Planning Council, which functions *“to promote town and country planning in the country, within the framework of national policy, as an efficient and effective tool for enhancing the physical environment and achieving sustainable development in the country”*. In addition, Part 2, subsection 3 allocating the role of general planning policy at state government and local authority levels, where *“subject to Clauses (5) and (6) of Article 91 of the Constitution, the State Authority shall be responsible for the general policy in respect of the planning of the development and use of all lands and buildings within the area of every local authority in the State; the State Authority may, in or for the purpose of discharging the responsibility of the State Authority under this section, from time to time give to the Committee or any local planning authority directions of a general character not inconsistent with the provision of this Act, and the Committee or local planning authority shall give effect to such directions”*. Referring to PLANMalaysia (2020), planning governance is organised into three (3) tiers, namely, federal, regional/state and local. At the federal level, it is governed by the Ministry of Federal Territories, PLANMalaysia, federal departments and agencies. National Physical Plan, Five-Year Malaysia Plan, sectoral policies/strategies, National Urbanisation Policy and National Rural Planning Policy are implemented at the federal tier, translating spatial planning as a macro policy for Malaysians. In regional/state tiers, the spatial planning is governed by the respective state government and PLANMalaysia@States (within 12 states in Peninsular Malaysia). Under regional and state planning, the provision of specific policies for each state and several regions that are formed includes utilising regional plan, structure plan and sectoral policies/strategies as guides in strategic planning. Subsequently, Peninsular Malaysia has 100 local authorities (including the Federal Territories of Kuala Lumpur and Putrajaya). Local governments are responsible for the provision of two policies at the local tier: the Local Plan and the Special Area Plan for their respective territories. For instance, all policies that exist under this legal provision must be pragmatically implemented, monitored and reviewed at each tier to guarantee that the national state and the local government are effective, efficient and can procure sustainable development for Malaysians.



**Figure 1:** Malaysian Spatial Planning Framework  
 Source: Adopted from PLANMalaysia (2020)

## RURAL SETTLEMENT IN MALAYSIA

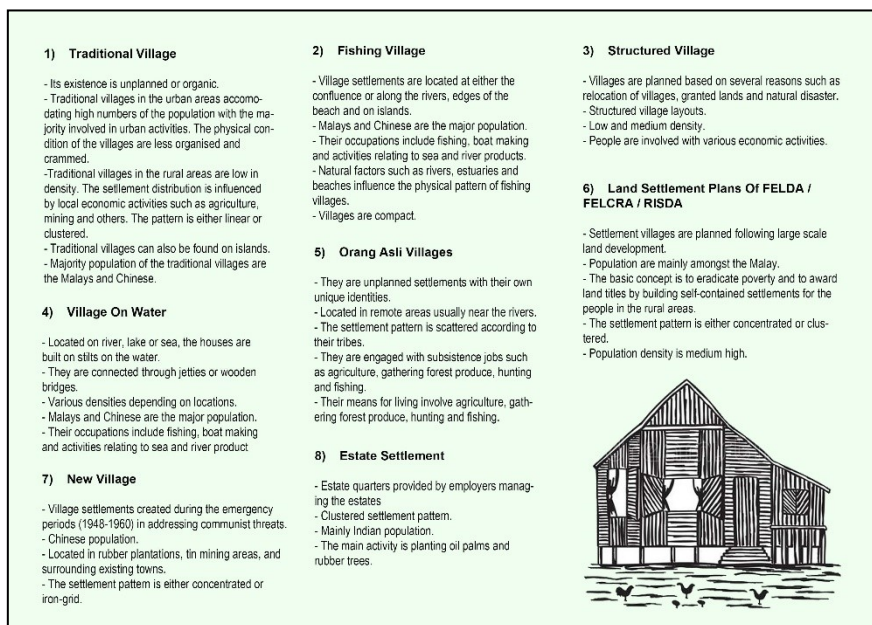
Rural settlements, such as urban areas, are organised in a hierarchy that has been established based on criteria and features. The classification of the provided category against rural areas is performed to guarantee that each rural area performs its functions and appropriately governs the region. Malaysian settlements in rural areas are classified into three categories: towns, District Growth Centres (DGC) and villages. The definition and criteria for the three (3) categories of rural settlements are as follows (PLANMalaysia, 2017):

- i. Town  
 “Town is a small settlement with urban characteristics but has a population of less than 10,000 people. Usually, towns provide various facilities and basic social services, such as schools, markets, public halls, playgrounds, police stations, mosques and clinics”.

- ii. **District Growth Centre (DGC)**  
“DGC is a settlement outside the city where it provides various services, such as a centre for the dissemination of information and innovation, the distribution of necessities, collecting and marketing of village products as well as offering of non-agricultural job opportunities to the villagers”.
  
- iii. **Villages**  
“Settlements other than towns and DGC are identified as villages, including traditional villages that are developed organically by settlers in groups or individually. Structured villages are developed by the government either in resettlement plans or plans to open up new land and private agricultural estates”.

### Typology of Villages in Malaysia

DPF Desa Negara 2030 is Malaysia’s first spatial rural planning policy that fulfils the objectives of a national rural development policy. With the establishment of the country’s rural planning policy, eight categories of villages were established, along with criteria for representing the privileged elements of rural settlements. The eight categories of villages established under DPF Desa Negara 2030 are illustrated in **Figure 2** below.



**Figure 2: Eight (8) Categories of Village in Malaysia**  
*Source: PLANMalaysia (2017)*



## METHODOLOGY

This study adopted a qualitative method by using content analysis. Several documents were gathered including secondary data obtained from spatial development policies, such as National Urban Policy, Rural Physical Planning Policy, National Physical Plan and Structure Plan. Further analysis was conducted using spatial analysis (Geographical Information System Software). A few criteria were selected, and the overlay technique was performed to map the affected boundaries of villages as gazetted protected areas for traditional villages and KESAS (paddy). The data were based on the Penang Policy Direction as mentioned in Penang Structure Plan and National Physical Plan. An overlay between village boundaries in 2019 and development priority areas (DPA) as stipulated in the Penang State Structure Plan 2030 has been made to produce a comparative analysis of the study.

## DATA ANALYSIS AND FINDINGS

Table 1 presents the 638 villages in the state of Penang. Majority of the village categories found in the boundaries of the state of Penang are traditional villages with a percentage of 88.08%. Seberang Perai Utara District has the largest number of villages amongst other districts with 239 villages.

**Table 1: Total Number of Villages by Category in Penang (2019)**

Village Categories	Timur Laut District	Barat Daya District	Seberang Perai Utara District	Seberang Perai Tengah District	Seberang Perai Selatan District	Total	%
Traditional Village	59	48	228	118	109	562	88.08
Structured Village	6	6	5	9	2	28	4.38
Village on Water	6	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	6	0.94
Fishing Village	1	9	1	1	1	13	2.03
New Village	<i>null</i>	<i>null</i>	1	5	3	9	1.41
Estate Settlement	<i>null</i>	<i>null</i>	4	3	10	17	2.66
Squatter	<i>null</i>	<i>null</i>	<i>null</i>	3	<i>null</i>	3	0.47
Total	72	63	239	139	125	638	100

*Source: PLANMalaysia (2019)*

### Projection of Village Boundaries affected by DPA in Penang State Structure Plan 2030

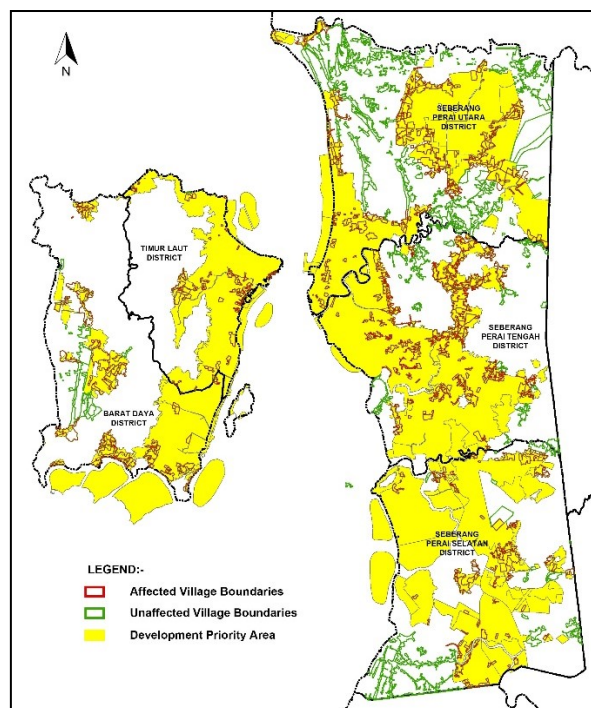
According to a projection based on Penang's DPA until 2030, a total of 20133.83 acres of village boundaries, or 52.92%, will be affected by the future development direction towards 2030. Referring to Table 2, the village boundaries in Seberang Perai Utara District will be significantly affected, with an area of 7968.89 acres (20.95%). This district has the largest number of villages in the state, where the main land use is agriculture, focused on paddy farming activities. Many areas in

this district have been gazetted as rice granaries. The Seberang Perai Tengah District is the second most affected, with a village boundary of 4876.38 acres (12.82%). The affected village boundaries in Seberang Perai Selatan District are 2519.57 acres with a percentage of 6.62%. Meanwhile, the spatial development trend outlined in the Penang State Structure Plan 2030 will influence the island part of the Barat Daya District, which comprises 3759.37 acres (9.88%). Nevertheless, the boundaries of the villages in the Timur Laut District are affected in general given that all of the villages in this district are located close to the urban area of George Town, which is the capital of Penang; the pace of urbanisation in this district is extremely fast. The only exception is the village on water, which has already been gazetted as a heritage village in the George Town special area plan. In terms of the entire category of villages in the state of Penang, the traditional village is the most affected, with a total area of 18060.61 acres (47.47%), as compared with other existing categories.

**Table 2: Projection of Villages Boundary Affected by Development Outlook Based on Penang State Spatial Planning 2030**

Village Categories	Sum of Area (Acres)										Total Existing	Total Affected
	Timur Laut District		Barat Daya District		Seberang Perai Utara District		Seberang Perai Tengah District		Seberang Perai Selatan District			
	Existing	Affected	Existing	Affected	Existing	Affected	Existing	Affected	Existing	Affected		
Traditional Village	868.86	868.86	3871.83	3086.91	20074.82	7520.51	5391.86	4372.49	4322.71	2211.84	34530.08	18060.61
Structured Village	134.67	134.67	248.39	248.39	95.10	95.10	168.39	168.39	108.67	14.32	755.21	660.85
Village on Water	22.55	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	22.55	<i>null</i>
Fishing Village	6.10	6.10	424.07	424.07	92.83	92.83	30.46	<i>null</i>	20.55	<i>null</i>	574.01	523.00
New Village	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	1100.78	<i>null</i>	340.69	310.89	293.53	180.75	1735.00	491.64
Estate Settlement	<i>null</i>	<i>null</i>	<i>null</i>	<i>null</i>	284.99	260.45	29.70	24.61	112.66	112.66	427.36	397.72
<b>Total</b>	1032.18	1009.63	4544.29	3759.37	21648.52	7968.89	5961.10	4876.38	4858.12	2519.57	<b>38044.21</b>	<b>20133.83</b>
<b>%</b>	2.71	2.65	11.94	9.88	56.90	20.95	15.67	12.82	12.77	6.62		<b>(52.92%)</b>

*Source: Modified Data from PLANMalaysia (2019)*



**Figure 4:** Map of Village Boundaries affected by Development Priority Areas based on the Penang State Structure Plan 2030

### The Policies related to Malaysian Spatial Planning Framework

**Table 3:** Related Policies to Malaysian Spatial Planning Framework

Related Policies	Strategies/Policies Statement
Sustainable Development Goals (SDGs)	Goal 11 (Sustainable Cities and Communities) -“By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries” -“Support positive economic, social and environmental links amongst urban, peri-urban and rural areas by strengthening the national and regional development planning”
New Urban Agenda (NUA)	“Satisfy the challenges and opportunities of present and future sustained, inclusive and sustainable economic growth, leveraging urbanisation for structural transformation, high productivity, value-added activities and resource efficiency, harnessing local economies and taking note of the contribution of the informal economy whilst supporting a sustainable transition to the formal economy;

	-“Fulfil their territorial functions across administrative boundaries and act as hubs and drivers for balanced, sustainable and integrated urban and territorial development at all levels”
National Urbanisation Policy 2	Thrust 1: Efficient and Sustainable Urban Development NUP 4: Urban growth limit is determined based on its carrying capacity for all towns in the country. NUP 5: Optimal and balanced land use planning shall be given emphasis in urban development. NUP 7: Village development in towns shall be integrated with urban development. NUP 8: Environmentally Sensitive Area and Prime Agricultural Area shall be conserved.
National Rural Planning Policy 2030	The National Rural Physical Planning Policy 2030 was designed to address the issue of development imbalance between urban and rural areas and increasing urbanisation. Core 2: Strengthening of Symbiotic Relationships Urban–Rural Core 3: Strengthening of Rural Dwelling Capacity
4 <sup>th</sup> National Physical Plan 2040	The fourth RFN with the goal of “Resilient and Prosperous”, was drafted as a comprehensive development plan with a focus on aspects of national security planning, including the management of national water areas in the vicinity of three nautical miles, digital infrastructure improvement, smart development, a carbon-neutral country and guaranteeing national food security in addition to the formation of inclusive and viable communities. Core 1: Dynamic and Balanced Growth Core 2: Spatial Sustainability and Resilience to Climate Change Core 3: Liveable Environment and Inclusive Communities
Penang State Structure Plan 2030	Chapter D, 6.2: Conservation, Preservation and Development of Village Area SP 6.2.1: Planning and Developing Village Land Use Holistically SP 6.2.2: Conserve and Preserve the Identity Compatibility and Character of the Village with the Surrounding Area Especially Heritage Village SP 6.2.3: Encouraging Economic Activities to Support the Rural Tourism Industry
Local Plan	- Draft Local Plan for Seberang Perai 2030:- T2-01-2: Retention of Selected Villages to Improve the Quality of Life Action 1: Maintenance of Traditional Village Action 2: Redevelopment and Renewal of the Fishing Village Area - Local Plan for Barat Daya and Timur Laut District status is not yet available.

## **DISCUSSION**

As shown in Figure 4, the overlay of affected villages within the development priority area is scattered into five main districts in Penang. The districts potentially affected due to pressure of development are Seberang Perai Utara and Seberang Perai Tengah. The development priority area has been identified in Penang Structure Plan 2030, considering future development, which concerns socio-economy, investment and state and regional growth. By 2030, the affected villages in DPA Penang will potentially transform into more competitive land uses, and the loss of rural settlements may affect human capital in food security. Furthermore, the development priority is a high investment area to be developed by the investors. Majority of the land ownership is individual and privately owned, restricting the sustenance of rural settlements. Some underlying reasons for selling their land are financial constraints and the profitable value for selling their land. Despite the potential loss of these villages, the State Government emphasised that the policy of Penang Structure Plan 2030 should consider village boundaries as well as identify potential villages that can be listed as heritage villages for preservation.

The unaffected areas are mostly for agriculture land use; the areas are gazetted for paddy agriculture, and some are still maintained because they are not priority for development. However, the non-gazetted area might be affected in the next 20–30 years if no action is taken by the state government to maintain it.

Valuable villages that are part of the state development should be protected to sustain and balance the development between urban and peri-urban. Hence, the state and local government play an important role to ensure a balance development direction in sustaining the human capital residing in the village area. The sustainability of the environment can be protected by imposing the policy or gazettement in protecting the village's boundaries, as highlighted in SGD.

## **CONCLUSION**

Urbanisation and protecting the rural settlement boundary face crucial conflict. Albeit, several spatial planning frameworks emphasised on strategic approach for development in the future. The cost that our nation will incur should not be ignored. Although land ownership might be challenging for the sustainability of villages, the transformation of the land uses into more competitive investments in line with future development is more compelling for the landowners. Out-migration has been a factor of urban sprawl, and the conversion of village settlement affects the human capital in securing the food security, which is mainly concentrated in rural and peri urban areas. The protection of environmentally sensitive areas has been gazetted to secure the resources for our population and nation, but the factor of human capital settlements should be adhered to planning strategic framework.

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## **AN ANALYTICAL PERSPECTIVE OF RESIDENTS' VIEW ON THE PROVISION OF RECREATIONAL FACILITIES USING WARP-PLS**

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### **Abstract**

Recreational facilities are among the vital services that aid in the development of a community, but its provision is complex. Hence, the need for the involvement of residents in the provision processes. This paper aims to examine the residents' view of the provision of recreational facilities in the Greater Jos metropolis of Nigeria. The data were collected from the field survey and analysed empirically. The partial least squares structural equation modelling technique was applied in analysing the responses. The results show that the provision has a significant positive effect on the relationship between appropriateness and stakeholders' involvement. In contrast, the provision had a significant negative effect on the relationship between accessibility indicators. Accessibility does not affect the relationship with the provision of recreational facilities. In conclusion, it has been determined that the relationship between the provision is stronger with the appropriateness in terms of categories and attractiveness of the facilities.

**Keyword:** Provision, recreational facilities, accessibility, appropriateness, stakeholders, Warp-PLS analysis

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## **INTRODUCTION**

The rapid pace of urbanisation and population growth pose significant challenges to most urban areas in developing countries. Therefore, the increasing population and demand for more services have outpaced local authorities' ability to provide or extent supportive services that should go hand in hand with urbanisation. This makes the urban system functional and, to some extent, influences the rate and trend of urban development lacking or inadequate (Kronenberg et al., 2020). Thus, it affects economic development through the shortage of the supply of the services (Fan et al., 2017).

The challenges of recreation facility provision relate to the services facilities' demand (Adesogan, Mohammed, & Kambu, 2018). Referring to the case study and according to the findings of Doxiadis in the Greater Jos Area Final Master Plan Report (Doxiadis Associates, 1975) and Shankland Cox Partnership (1980), the reports stated that there were limited cultural and recreational facilities. The most recent report, the Greater Jos Master 2009, has not been approved nor pro-action taken toward implementation. The problems of the provision of recreational facilities is generally a reflection in the whole of Nigeria. Gani (2018) in the study of Abuja found out that the major problems of the provision of recreational facilities include invasion of recreational areas by other competing land uses, long journey, inadequacy and poor maintenance of the recreational facilities. Hence, it is necessary to put a straight record of the current scenario to portray its true reflection considering the research outcome. Hence the aim of the paper is to examine the residents' view of the provision of recreational facilities in the Greater Jos. The study is part of a broader research project, which considered the Greater Jos Plateau State, Nigeria, which consists of the six Local Government Areas of Plateau North, Jos-North, Jos-South and parts of Jos-East, Bassa, Riyom and Barki-Ladi. Fola Konsult put the population at 1.3m in 2009 and, by current estimated 1.5 million people.

## **LITERATURE REVIEW**

Policies and guides to planning with legislative principles are necessary for consideration, such as the facility's location, the capacity of the services, accessibility to the site and demographics, and the potential socioeconomic and environmental impacts. Likewise, equity, availability, engagement, integration of cultural significance, quality, efficiency and effectiveness, and fairly flexible are significant factors to behold (Davies & Laforteza, 2017; Onubi, Yusof, & Hassan, 2020). The elements mentioned above and many more as biodiversity, aesthetic, and usability, resolve residents' perception of the space (Yu, Che, Xie, & Tian, 2018).

Accessibility examines the degree of ease by which people can access the recreational facility. One of the most often objectively way to assess accessibility is centred on the gravity potential model, which is a function of



travel cost from an origin of the facility to all destinations possibly considered (in other words a distance decay function). It differentiates between areas with similar numbers of facilities serving different population densities, hence providing a better realistic impression of accessibility to services especially the recreational facilities (Jiao et al., 2015; Mavoja et al., 2019).

The choice for the type of activities, and what characteristics of recreation an individual pursues influences various types of activities. The concern is where the needs of the people and circumstances of the provision are not reasonably correlated, or evenly distributed to the desires of the individuals do lead to dissatisfaction (Gao, Song, Zhu, & Qiu, 2019; Wash & Mohammed, 2019).

The philosophy for recreational activity is said to have less responsiveness due to lack or inadequate research on motivation for recreational activities. Hence, the movement to connect research and practice and in this case, the stakeholders' impact is affected (Parr & Schmalz, 2019). Stakeholders with interest in parks and recreation usually perform a significant role in the provision recreational (Cavnar et al., 2004).

The above literature review informed the creation of the conceptual framework of the study considering Accessibility of Recreational Facilities, Appropriateness of RF, and Stakeholders' Involvement. Thus, the study emphasis is on the general alternative hypotheses in accordance with the independent variables and the dependent variable. The assumed hypotheses are backed by the study's conceptual framework as; H1: The spatial provision of recreational facilities have a significant influence on the accessibility of recreational facilities in the Greater Jos. H2: The spatial provision of recreational facilities has a significant influence on the appropriateness of recreational facilities in Greater Jos. H3: The spatial provision of recreational facilities has a significant influence on the stakeholders' Involvement of recreational facilities in Greater Jos.

## **METHODOLOGY**

The research procedure helps to identify and clarify problems, instruments development.

**Data collection:** The study adopted a simple random sampling technique for data collection. Respondents are chosen randomly among permanent residents (over five years of residency) residing in 10 sectors of Greater Jos and aged over 15 years old. The survey was self-administered in different parts of the sectoral areas, bus stations, streets, and restaurants. The distribution of the questionnaires was done according to density of the development of the sectors which depicts the population variation, and so administered. The surveys lasted for four (4) months between December 2018 and March 2019. The researchers settled for 450

respondents from the estimated one million five hundred population in Greater Jos, though, recovered 400 responses which were analysed.

**Data Analysis:** Based on the responses received, the data collected is understood to be the assessment of the RF provision. The analysis examines the relationships between the dependent variables and independent variables (Multiple Regression using Warp PLS version 0.6).

**Reliability test:** From the following statistical test (Table 1), the value is negative (-0.83) due to a negative average covariance among items. This violates reliability model assumptions. It is because of this unstandardized item that the researchers opted for WarpPLS which takes bigger data and solved to standardized form.

**Table 1: Reliability Test**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items <sup>a</sup>	N of Items
.074	-.083	9

(Source: Researchers, 2019)

## FINDINGS

The finding shows the statistical data analysis of this research. The presentation includes the background of the respondents, factor analysis results, main and supporting analyses that address the main research aim. Attention is focused on those indicators with high outer weights having indicators like distance to RF, Transport to RF and cost to enjoy RF being of more importance. The results show all significant being less than 0.05 (Table 2).

**Table 2. Accessibility (Measurement Model Exogeneity).**

Constructs	Item(s)	Weight	Convergent	P. Value	VIF	WLS	ES
<b>Accessibility to</b>	Walking	(0.146)	0.59	0.005	1.053	1	0.045
	Distance	(0.202)		<0.001	1.096	1	0.049
<b>Recreational Facilities</b>	Transport	(0.236)		<0.001	1.139	1	0.135
	Affordability	(0.107)		0.031	1.120	1	0.035
	Cost	(0.246)		<0.001	1.161	1	0.013

The results in Table 3 show that five indicators, residents' participation in planning, Not involved, management, lacking facilities and inappropriate are significant been less than 0.05, while seven indicators are not significant.

**Table 3.** Involvement of Residents (Measurement Model Exogenous).

Constructs	Item(s)	Weight	Convergent	P. Value	VIF	WLS	ES
<b>Involvement of Residents and Planning Authority</b>	Informed	(0.061)	0.55	0.145	1.103	1	0.001
	Planning	(0.229)		<0.001	1.147	1	0.131
	Not Involved	(0.099)		0.042	1.208	-1	0.006
	Develop Recreations	(0.008)		0.447	1.042	1	0.000
	Maintenance	(0.040)		0.244	1.258	1	0.009
	Management	(0.415)		<0.001	1.297	1	0.223
	Lacking	(0.129)		0.012	1.573	-1	0.005
	Inappropriate	(0.100)		0.041	1.921	1	0.002
	Unattractive	(0.077)		0.091	1.815	1	0.007
	Distance	(0.057)		0.160	1.417	1	0.012
	Insecurity	(0.026)		0.329	1.043	-1	0.000
	Insecurity	(0.043)		0.228	1.030	-1	0.001

In Table 4, the results show 20 indicators are significant, being less than 0.05, while eighteen indicators are not significant.

**Table 4.** Appropriateness and Adequacy (Measurement Model Exogeneity)

Constructs	Item(s)	Weight	Convergent	P. Value	VIF	WLS	ES
<b>Appropriateness and Adequacy of Recreational Facilities</b>	Importance	(0.011)	0.32	0.427	1.306	1	0.000
	Football	(0.177)		<0.001	2.202	-1	0.013
	Outdoor Table Tennis	0.000		0.495	2.133	1	0.000
	Outdoor Badminton Court	(0.022)		0.350	1.780	1	0.001
	Basketball	(0.138)		0.008	2.140	-1	0.010
	Volleyball	(0.022)		0.351	2.060	-1	0.002
	Squash	(0.006)		0.458	1.530	1	0.001
	Trekking/Walking	(0.142)		0.006	2.474	1	0.000
	Biking	(0.245)		<0.001	1.971	1	0.032
	Hiking	(0.181)		<0.001	1.583	1	0.006
	Swimming Pool	(0.168)		0.002	1.717	1	0.009
	Parks and Garden	(0.183)		<0.001	1.746	1	0.020
	Clubs	(0.112)		0.025	1.812	-1	0.001
	Gymnasium	(0.063)		0.139	1.499	1	0.002
	Picnic Sites	(-0.002)		0.485	1.916	1	0.000

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Skating	(0.124)	0.015	1.286	-1	0.006
Hockey	(0.038)	0.255	1.451	1	0.006
Rock Climbing	(0.080)	0.082	1.627	-1	0.003
Long Tennis	(0.129)	0.012	1.397	-1	0.005
Garden/ Park	(0.070)	0.111	1.706	-1	0.002
Polo game	(0.101)	0.039	1.493	-1	0.001
Golf	(0.024)	0.342	1.592	1	0.002
Museum/ Heritage Parks	(0.123)	0.016	2.453	-1	0.000
Zoo/ Wildlife Park	(0.158)	0.003	2.796	-1	0.027
Resorts	(-0.031)	0.293	2.445	-1	0.000
Often Visit	(0.208)	<0.001	1.389	1	0.075
Children Available	(0.120)	0.018	1.369	-1	0.005
Youth Available	(0.022)	0.354	1.532	1	0.003
Adults Available	(0.113)	0.024	1.333	1	0.040
Elderly Available	(0.022)	0.350	1.199	1	0.001
Disabled Available	(0.004)	0.471	1.208	1	0.000
Talking and greeting	(0.162)	0.002	1.431	1	0.029
Crowded with people	(-0.020)	0.368	1.273	-1	0.004
Children Underserved	(0.142)	0.006	1.320	1	0.016
Youth Underserved	(0.004)	0.476	1.528	1	0.002
Senior Citizens Underserved	(0.151)	0.004	1.444	-1	0.022
Disabled Underserved	(-0.141)	0.007	1.320	-1	0.018

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### Structural Model Assessment

The structural model is used to capture the regression effects of the endogenous construct upon one another. The results show two (2) statistical tests were

assessed at 5 percent level of significance except for accessibility with a path coefficient of 0.09 (Figure 1). The path coefficient estimated for hypothesised relationships being significant, having 0.47 and 0.16 with P. Values of 0.01 each. A path coefficient estimate is considered statistically significantly different from zero at a 5% significant level when its P. Value is below 0.5. R2 of 0.30 seems good enough.

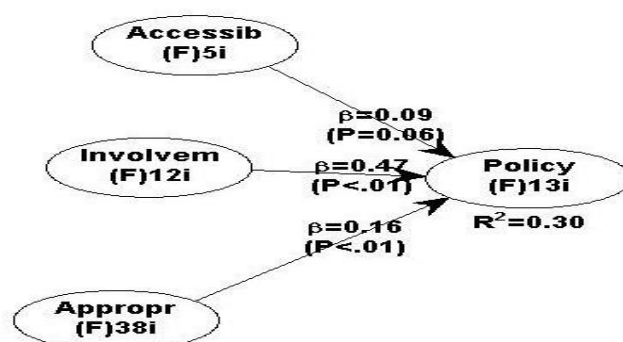


Figure 1: Structural Model

With this result, it will be reported and hypothesised that the spatial provision and distribution of RF has no significant influence on the accessibility of RF in the Greater Jos (**H<sub>1</sub>**) (Table 5). The spatial provision and distribution of RF do significantly influence the appropriateness and adequacy of RF in the Greater Jos (**H<sub>2</sub>**). The path coefficient value having a low significant value of 0.01 is accepted. It can also be hypothesised that the spatial provision and distribution of RF has a significant influence on the effectiveness of RF in the Greater Jos (**H<sub>3</sub>**). This is regarding the R2 value been 0.3 having an acceptable mid-value range is accepted.

Table 5. Hypothesis Testing Results

Hypothesis	Path Coefficient	P-Values	Decision
<b>H1:</b> Accessibility affects the provision of recreational facilities	<b>0.09</b>	<b>0.06</b>	<b>Not Supported</b>
<b>H2:</b> Appropriateness and Quality influence the provision of recreational facilities	<b>0.16</b>	<b>0.01</b>	<b>Supported</b>
<b>H3:</b> Involvement of community stakeholders affect the provision of recreational facilities	<b>0.47</b>	<b>0.01</b>	<b>Supported</b>

### Interpretation of Findings

For the test the accessibility was not supported, meaning that there are no issues with accessing recreational facilities, which is obviously influenced by the

respondents located in the densely populated areas at the core city. While, the test showed the variables with regards to appropriateness being supported, indicating that the indicators do influence the provision of the facilities. Adjudged by the response, the scores from the findings further strengthened the effects of the results. This indicates that the variables are important and about 100% of the variables were significant at  $p < 0.05$ . The test supported the variables that influenced the involvement of the stakeholders in the provision of the recreational facilities as presented. This further strengthened with the correlation coefficient analysis that tested viably influenced variables regarding the independent variables and the dependent variable.

## **DISCUSSION**

This section presents a detailed discussion of the results and defines the connections of the study's findings by comparing them with the findings of previous similar research works as presented in earlier discussed literature.

The finding has shown that there is no problem with accessibility using the empirical data. Though the respondents are from the predominantly densely populated areas of the core city, they tend to have a divergent view of the easy reach to the facilities. This agrees with Kelobonye et al. (2019) findings, reiterating that the outskirts are under-served as the facilities are mostly focused on the city centre. Given that more new developments have occurred in fringe areas than inner areas as time goes by, resulting in more people being at the disadvantage of the facilities. Also, the findings of Schultz, Wilhelm Stanis, Sayers, Thombs, & Thomas (2017) supported the claim from their study that shows increasing access to parks use considering the neighbourhood concept. This implies more participation within easy reach when the neighbourhood concept is applied. The need for easy reach to RF even at outskirt being new developing areas.

The findings identify inappropriate RF, lack and insufficient for all age groups, mostly the children and disabled. This study is similar to the findings of Lamanes & Deacon (2019), that in terms of lack of RF among a group of people indicated non-establishment of social ties, while the basis of social relations is the availability of the RF and Involvement in its activities. Though the study did not capture the rate of inappropriateness, perhaps due to the complete absence of RF, the findings Lyu & Lee (2016) gives an insight considering persons with disabilities, and they found out that among the several elements of leisure constraints to the participation of inappropriate recreation facilities is one of the major factors. Based on the findings, they recommended policies that would help people with disabilities develop the desire to participate in recreational activities. The finding also agrees with the finding of Muiga & Rukwaro (2017) and Mohd Shobri, Abdul Rahman, & Md Saman, (2021), considering the inappropriate location of the facilities within the development plan and poor organisation of the

facilities with regards to management, lack of security and safety. Though they were in good condition, but in short supply.

The residents' involvement in the provision of RF in Greater Jos is based on the stakeholders' involvement as private operators (Providers) and government agencies. The finding determined their role in initiating a plan for the provision of RF, being sources of information and agent in conveying the information to the authorities/government concerning the prevailing situations. This finding is an action to intervention, which supports the finding of Liu et al. (2019) toward dealing with the contradictions of processes of achieving aims and expected results. The finding found inactive participation in recreational activity to substantiate the purpose of provision of the facility. Hence the challenge to stir up the affected stakeholders to involve adequately in the provision plans and programmes. Here lies the novelty in establishing and the willingness of the stakeholders to initiate and participate in the planning processes. This fact also agrees with the findings of VermeerSch & VAnDenbroucke (2014). In stimulating participation and about socio-cultural participation, they concluded that promoting socio-cultural participation as a vehicle to build a more inclusive society is intended to be a right. This evidence suffices to adore the role of stakeholders in policy formulations. The finding of Sacchelli, Fabbrizzi, Geri, & Ciolli (2018) is contrary because of the priority placed for intervention for a five year interval. This helps in the effective managerial benefits in case of decision support.

### **CONTRIBUTION TO METHODOLOGY**

The choice of an approach must have a philosophical background to determine fit. This study adopted this analysis based on the uniqueness of the research and the paradigm shift in approach to arrive at an acceptable answer adequately and substantially to the issue at stake. The finding expresses the correlation between the variables, the independent and dependent, the other two shows positive response indicating support for the hypothesis. This invariably projects the method by determining that the variables are indicators to hold on to concerning the provision of RF, hence the benefit of quantitative approach. The quantitative approach is a novel in this area of study that is quite revealing regarding the finding of facts, knowledge, and understanding of the system of the provision of RF.

### **LIMITATIONS AND SUGGESTION FOR FUTURE RESEARCH**

The study only focused on the provision of RF, while the questionnaire was conducted based on a projected figure from literature instead of the National Population Commission (NPC). Therefore, further studies should investigate each facility critically with their attendant facilities (water, electricity, road and landscape) within the Greater-Jos.

## CONCLUSION

This implies that the provision of the RF is short of meeting the needs of the residents of the Greater-Jos. This study revealed that the elements connected with the four constructs were of utmost importance. The weak ones are the accessibility and the preferences of the categories of RF. The reasons are, as discussed earlier, having the dense population within the core city where the facilities abound, while the types of the facility options were vast compared to the chosen. Hence, this study is pioneering the reformation of the provision for a viable community of residents via a pragmatic system framework approach so that residents of Greater-Jos can have access to recreational activity areas near home and affordable. The findings supported the correlation as being one of the determinants to the provision of the RF. Therefore, the finding is serving as a piece of useful information for correcting the order of the provision for maximum use and meeting the desires of the people of the area.

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## **BUILDING CODES IN RURAL AREAS OF PAKISTAN**

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### **Abstract**

Building codes are an established strategy for ensuring safe and hygienic construction. These codes' development, adoption by the local councils, enforcement, and cyclic improvement are all substantial in a resilient built environment. Illustriously, the literature review indicates lacunas in building codes in Pakistan, especially in rural areas. The natural disasters and evident climate change in Pakistan are significant threats to Pakistan's built environment. The primary aim of this study is to investigate the effectiveness of building codes, the challenges faced by building codes, and the venues for improvement for code compliance in rural areas of Pakistan. A qualitative approach was adopted by developing a survey instrument targeting the randomly selected built environment professionals. The responses were analyzed using SPSS V24 for reliability and triangulation of the observed variables and leading constructs. The study's findings demonstrate that the development of building codes, their adoption and enforcement by the local councils, and monitoring need improvement. Furthermore, the study findings suggest that the inclusivity of architects, planners, and code officials in the development of building codes has the ability to bring resilience to the built environment in rural areas of Pakistan.

**Keywords:** building codes, resilient, built environment, rural areas

## **INTRODUCTION**

The building codes are a set of rules for regulating construction activity in a specified region. They cover essential criteria for building in conformity with administrative control. According to Ching and Winkel (2019), these codes are the rules on how buildings should be planned and constructed considering health, safety, and quality measures. The building codes are reference instruments used by architects, engineers, developers, and the general public to observe buildings' safety, health, and welfare (Spivack, 2016). Torgal & Jalali (2012) trace the history of building codes to Babylon, where the ruler Hammurabi imposed a death sentence on the builders whose structures crumbled. The famous Rebuilding of London Act of 1666 declared fire resistance in buildings mandatory. The American Insurance Association, in 1905, developed the first national-level building code forming the base for current building regulations. The International Conference of Building Officials (ICBO) was formed in 1922, and they developed the first Uniform Building Code in 1927. The American Building Code (BOCA National Building Code) of the 1950s is a milestone in standardization and regulation in construction.

The International Code Council (ICC) was formed in the 1990s, resulting in the formulation of the International Building Code in 1997, and continues developing versions of these building codes. The International Building Code (IBC) was a result of blending the Standard Building Code, BOCA National Building Code, and Uniform Building Code. In addition, there are several other standards and codes like Applied Technology Council (ATC), the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), the American Institute of Steel Construction (AISC), American Society of Civil Engineers (ASCE), and American Concrete Institute (ACI), etc. These platforms issue standards for particular applications used as a reference by diverse organizations and codes globally.

Codes have been a primary element governing the planning process, design, and construction for a long time. The building codes are developed by the government or semi-government bodies and are enforced all over a region. In contrast, codes' development, approval, and compliance vary from country to country (Ching & Winkel, 2019). According to Abounaga and Mostafa (2019), the primary goal of building bylaws is to achieve minimum safety, general welfare, and health of the inhabitants of a building. These regulations are expected to encompass exterior envelop, wall assemblies, foundations, room sizes, roofing, stair design, mechanical and electrical systems, lighting, drainage, and plumbing.

Generally, local governments regulate construction using a model building code system. When municipalities adopt these codes, they attain a legal status within their jurisdiction and become regulations called "adoption by reference" (Ornelas, Guedes, and Breda, 2016). Local governments sometimes

develop building construction codes, usually with prescriptive and performance-based requirements. The prescriptive code method relies on fixed design values based on empirical data, whereas the performance-based codes require performance from particular elements (Moore, 2013). These codes are the minimum allowable norms outlining all construction and demolition in the construction industry. The professionals must realize the language of these codes for designing three-dimensional components of a structure. Architects and engineers must apply these codes to their design for construction permits before the execution of work (Spivack, 2016).

### **BUILDING CODES IN RURAL AREAS OF PAKISTAN**

All construction and development must conform to the codes once adopted by a municipality or local council. The district councils issue the construction permit in Pakistan submitted by the PCATP registered architects to the municipal agency. There are several layers of local boards in Pakistan, like the Lahore Development Authority, Peshawar Development Authority, Defence Housing Authorities, municipal/ metropolitan Corporations, and cantonment boards. Usually, these agencies have their set of planning bylaws to address building planning, floor-to-area ratio, building height, car parking, etc. Apart from issuing a building permit, these agencies are also responsible for inspecting the building construction. There are two sets of regulations; one is the building bylaws, and the other is building codes. The municipalities can develop their separate building bylaws while the Pakistan Engineering Council develops the construction codes empowered through section 25 of the PEC Act of 1975 (Muhammad, 2022).

The Pakistan Engineering Council has developed numerous codes, including the Pakistan Occupational Health and Safety Act 2018 (Draft), the Building Code of Pakistan-Fire Safety Provisions 2016, the Pakistan Electric and Telecommunication Safety Code 2014, the Building Code of Pakistan-Energy Provisions 2011, and the Building Code of Pakistan, Seismic Provisions 2007. Building construction on a specific scale and location must follow codes and laws, including the Disaster Risk Reduction Policy of 2013, the Pakistan Environmental Protection Act of 1997, The Factories Act of 1934, and The Mines Act of 1923. However, since the promulgation of provincial autonomy through the 18<sup>th</sup> amendment, the legal edifice of these national-level building codes remains ambiguous. Usman and Ibrahim (2016) state that building codes are not mandatory in Pakistan and lack adoption by local governments. Until now, none of the local councils has announced the adoption of these codes, which indicates legal, regulatory, technical, institutional, and financial barriers. Additionally, including relevant stakeholders in the code development process is a staunch distress amongst architects, planners, and developers (Ahmad, 2022).

The unplanned, illegal, unsafe, and unhygienic construction in Pakistan is a significant concern for built environment professionals (Ebrahim, 2022; Farid

et al., 2020). According to Rizwan (2021) and Ebrahim (2022), most of the buildings in rural areas of Pakistan are damaged due to earthquakes and natural disasters, causing the loss of human lives, livestock, and resources. International Code Council affirms that building codes play a significant role in protection from manmade and natural disasters. After the 2005 earthquake, the problem of inadequacy in building codes of Pakistan was recognized by experts (Maqsood & Schwarz, 2010; Haseeb et al., 2011). It was also noted that most of the donors for reconstruction were disinclined to fund the reconstruction due to building code enforcement. Spence et al. (2003) explain that the defects in buildings are due to the failure to achieve standards, while the lack of safety measures was also evident in most facilities (Deakin, 1999). Researchers claim that building failure is associated with the absence of building codes and regulations and their enforcement.

### RESEARCH METHODOLOGY

This study utilized a quantitative approach for collecting primary data by administering a survey questionnaire research technique. Researchers like Creswell (2009), Hoxley (2008), Leishman (2008), Naoum (2019), and Wang and Hofe (2008) recommend that surveys are an effective tool in the study of infrastructure and the built environment as it provides a descriptive explanation of trends, attitudes, and opinion of the target population. They further suggest that the surveys are used in cross-sectional research to derive data for generalization from a sample of the target population. The survey instrument uses close-ended questions with fixed alternatives (Dawson, 2011) to record the response in less time and be simpler for the subjects (Oppenheim, 1992). The instrument spans four leading constructs comprising 25 questions herein called Observed Variables using the Likert Scale from one (1) to five (5). Collecting information from licensed architects on building codes in Pakistan was the survey's primary objective hence called the population numbering 5007, and the sample size is derived to 136.

**Table 1:** Composition of the Questionnaire

Section	Leading Construct	Observed Variables
A	Profile of Respondents	Work Experience
B	Building Codes in Pakistan	Building Construction
C	Challenges in Building Codes	
D	Improvement in Building Codes	

The instrument was distributed randomly among PCATP-registered architects through an online platform (google forms). The architects were sent emails of the link and were further contacted after a week. The questionnaire was

statistically tested in SPSS V24 to establish its reliability and triangulation. The result of reliability is illustrated in the table below.

**Table 2:** Reliability of the Instrument

Leading Construct	No. of Indicator	Cronbach's Alpha
Profile of the Respondents	1	N.A
Building Codes in Pakistan	11	0.873
Challenges in Building Codes	8	0.942
Improvement in Building Codes	5	0.934

## FINDINGS AND DISCUSSION

### Demographic Statistics

The survey indicated that 58 percent of the respondents have more than ten years of professional experience. Only 19 percent of the respondents had less than five years of experience, increasing the possibility of professionally seasoned responses.

**Table 3:** Profile of the respondents

No.	Category	Frequency	Percentage (%)
1	<b>Work Experience</b>		
	1 year to 5 years	26	19
	6 years to 10 years	31	23
	11 years to 15 years	26	19
	16 years to 20 years	29	21
	More than 20 years	24	18

### Analyzing the Effectiveness of Building Codes in Pakistan

According to the literature, the effectiveness of building construction standards in Pakistan can be measured by the regulatory and normative aspects indicated by eleven (11) observed variables. Table 4 illustrates that “Planning, infrastructure, and building standards” are ineffective, with 75% of negative responses and mean value less than. Variable BCS-2 “Building Standards and Codes” was declared ineffective by 75% negation with a mean value of 2.09. BC-3 “Local building Byelaws and Regulations” was scored negative, receiving 78% ineffective and sometimes effective responses with a mean value of 2.07. BCS-4 “Technical Requirements for buildings” got a 78% response negative with a mean value of 1.97. BCS-5 “National Reference Manual on Planning and Infrastructure Standards 1986” received a 77.6% negative response, and its mean value is 1.85. BCS-6 “Building Code of Pakistan (Seismic Provisions 2007)” was regarded negatively by 79.7% of the respondents, whose mean value comes to 2.11. BCS-7 “Building Code of Pakistan (Energy Provisions 2011)” was rated as unfavorable by 83.8% of the respondents, while its mean value ranges less than 2.6. BCS-8 “National Climate Change Policy 2012” is declared ineffective by

89.7% of the respondents, and the mean value comes to 1.89. BCS-9 “Disaster Risk Reduction Policy 2013” was rated ineffective by 86% of the respondents, whose mean value is 1.90. BCS-10 “Pakistan Electric and Telecommunication Code 2014” was given negative by 83% of responses while the mean value is 1.96.

Similarly, BCS-11, “Building Code of Pakistan (Fire Safety Provisions 2016),” received 83.8% negative remarks, while its mean value is 1.88. In brief, all the existing building construction standards in rural areas of Pakistan are declared ineffective by the majority of the architects and executing agencies. This result is supported by the literature and confirms that the existing construction in rural areas of Pakistan is weak regarding the standards and codes.

**Table 4:** Responses for Effectiveness of Building Codes in Pakistan

<b>Code</b>	<b>Observed Variables</b>	<b>Frequency</b>	<b>Percent</b>
<b>BCS-1</b>	<b>Planning, infrastructure, and building standards</b>		
	Not effective	37	27.2
	Sometime effective	66	48.5
	Frequently effective	31	22.8
	Most effective	1	0.7
	Always effective	1	0.7
<b>BCS-2</b>	<b>Building Codes</b>		
	Not effective	25	18.4
	Sometime effective	77	56.6
	Frequently effective	31	22.8
	Most effective	3	2.2
	Always effective	-	-
<b>BCS-3</b>	<b>Local Building Byelaws and Regulations</b>		
	Not effective	27	19.9
	Sometime effective	79	58.1
	Frequently effective	25	18.4
	Most effective	4	2.9
	Always effective	1	0.7
<b>BCS-4</b>	<b>Technical Requirements for buildings</b>		
	Not effective	38	27.9
	Sometime effective	69	50.7
	Frequently effective	25	18.4
	Most effective	3	2.2
	Always effective	1	0.7
<b>BCS-5</b>	<b>National Reference Manual on Planning &amp; Infrastructure Standards 1986</b>		
	Not effective	40	29.4
	Sometime effective	82	60.3
	Frequently effective	9	6.6
	Most effective	4	2.9



	Always effective	1	0.7
<b>BCS-6</b>	<b>Building Code of Pakistan (Seismic Provisions 2007)</b>		
	Not effective	23	16.9
	Sometime effective	84	61.8
	Frequently effective	20	14.7
	Most effective	9	6.6
	Always effective	-	-
<b>BCS-7</b>	<b>Building Code of Pakistan (Energy Provisions 2011)</b>		
	Not effective	24	17.6
	Sometime effective	90	66.2
	Frequently effective	13	9.6
	Most effective	8	5.9
	Always effective	1	0.7
<b>BCS-8</b>	<b>National Climate Change Policy 2013</b>		
	Not effective	35	25.7
	Sometime effective	87	64.0
	Frequently effective	9	6.6
	Most effective	4	2.9
	Always effective	1	0.7
<b>BCS-9</b>	<b>Disaster Risk Reduction Policy 2013</b>		
	Not effective	39	28.7
	Sometime effective	78	57.4
	Frequently effective	13	9.6
	Most effective	5	3.7
	Always effective	1	0.7
<b>BCS-10</b>	<b>Pakistan Electric and Telecommunication Code 2014</b>		
	Not effective	35	25.7
	Sometime effective	78	57.4
	Frequently effective	17	12.5
	Most effective	5	3.7
	Always effective	1	0.7
<b>BCS-11</b>	<b>Building Code of Pakistan (Fire Safety Provisions 2016)</b>		
	Not effective	43	31.6
	Sometime effective	71	52.2
	Frequently effective	18	13.2
	Most effective	4	2.9
	Always effective	-	-
	<b>TOTAL</b>	<b>136</b>	<b>100</b>

**Table 5:** Mean Values of Building Codes in rural areas of Pakistan

Observed variables	Mean	Std. Dev.	N
(BCS-1) Planning, infrastructure, and building standards	1.99	0.775	136
(BCS-2) Building Codes	2.09	0.704	136
(BCS-3) Local Building Byelaws and Regulations	2.07	0.752	136
(BCS-4) Technical Requirements for buildings	1.97	0.788	136

(BCS-5) National Reference Manual on Planning & Infrastructure Standards 1986	1.85	0.726	136
(BCS-6) Building Code of Pakistan (Seismic Provisions 2007)	2.11	0.757	136
(BCS-7) Building Code of Pakistan (Energy Provisions 2011)	2.06	0.758	136
(BCS-8) National Climate Change Policy 2013	1.89	0.706	136
(BCS-9) Disaster Risk Reduction Policy 2016	1.90	0.769	136
(BCS-10) Pakistan Electric & Telecommunication Code 2014	1.96	0.774	136
(BCS-11) Building Code of Pakistan (Fire Safety Provisions 2016)	1.88	0.745	136

It was also considered necessary to examine the relationship between the building standards and codes. From the Pearson correlation, it can be observed that BCS-6, “Building Code of Pakistan (Seismic Provisions 2007)”, has a weak relationship with BCS-1, BCS-2, BCS-3, and BCS-4. BCS-7 “Building Code of Pakistan (Energy Provisions 2011)” have a weak relationship with BCS-2 and BCS-3. BCS-9 “Disaster Risk Reduction Policy 2013” has a weak relationship with BCS-2 and BCS-3. The most significant correlation is found between BCS-8 and BCS-9, BCS-8 and BCS-10, BCS-9 and BCS-10, BCS-10 and BCS-11

**Table 6:** Correlation of the observed variables for building codes in rural areas of Pakistan

	BCS-1	BCS-2	BCS-3	BCS-4	BCS-5	BCS-6	BCS-7	BCS-8	BCS-9	BCS-10	BCS-11
<b>BCS-1</b>	<b>1</b>										
<b>BCS-2</b>	.463**	<b>1</b>									
<b>BCS-3</b>	.458**	.534**	<b>1</b>								
<b>BCS-4</b>	.497**	.418**	.428**	<b>1</b>							
<b>BCS-5</b>	.394**	.185*	.235**	.355**	<b>1</b>						
<b>BCS-6</b>	.014	0.023	0.065	0.068	.461**	<b>1</b>					
<b>BCS-7</b>	.215*	0.155	0.123	.288**	.595**	.583**	<b>1</b>				
<b>BCS-8</b>	.256**	.228**	.195**	.393**	.561**	.439**	.635**	<b>1</b>			
<b>BCS-9</b>	.198*	0.153	0.062	.313**	.493**	.578**	.723**	.717**	<b>1</b>		
<b>BCS-10</b>	.346**	.210*	0.119	.338**	.479**	.437**	.673**	.711**	.716**	<b>1</b>	
<b>BCS-11</b>	.204*	.177*	0.160	.233**	.473**	.511**	.621**	.621**	.704**	.712**	<b>1</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed)

\* . Correlation is significant at the 0.05 level (2-tailed)

### **Analysing Challenges faced by the Building Codes in rural areas of Pakistan**

The leading construct of challenges in building construction standards and regulations contains eight (8) observed variables. The observations collected from the field are presented in the table above, illustrating the severe challenges. The mean value table explicitly shows that there is a severe lack of standards and regulations on a national, provincial, and local level, a lack of product

certification, a mismatch between national standards and standards for imported materials, and a lack of awareness, finance, and monitoring and enforcement.

**Table 7:** Responses for Challenges faced by the building codes in rural areas of Pakistan

Code	Observed Variables	Frequency	Percent
<b>BCR-1</b>	<b>Lack of national/provincial/local buildings standards</b>		
	None	3	2.2
	Very Mild	14	10.3
	Mild	28	20.6
	Moderate	59	43.4
	Severe	32	23.5
<b>BCR-2</b>	<b>Lack of national/provincial/local building regulations</b>		
	None	3	2.2
	Very Mild	14	10.3
	Mild	31	22.8
	Moderate	61	44.9
	Severe	27	19.9
<b>BCR-3</b>	<b>Lack of Product certification in the market</b>		
	None	5	3.7
	Very Mild	18	13.2
	Mild	26	16.1
	Moderate	45	33.1
	Severe	42	30.9
<b>BCR-4</b>	<b>Mismatch between national standards and standards of imported material</b>		
	None	4	2.9
	Very Mild	17	12.5
	Mild	24	17.6
	Moderate	52	39.2
	Severe	39	28.7
<b>BCR-5</b>	<b>Lack of experts/ expertise</b>		
	None	4	2.9
	Very Mild	16	11.8
	Mild	33	24.3
	Moderate	43	31.6
	Severe	40	29.4
<b>BCR-6</b>	<b>Lack of awareness</b>		
	None	2	1.5
	Very Mild	17	12.5
	Mild	55	40.4
	Moderate	37	27.2
	Severe	25	18.4
<b>BCR-7</b>	<b>Lack of finance</b>		
	None	3	2.2

	Very Mild	15	11.0
	Mild	30	22.1
	Moderate	62	45.6
	Severe	26	19.1
<b>BCR-8</b>	<b>Monitoring and Enforcement</b>		
	None	3	2.2
	Very Mild	14	10.3
	Mild	17	12.5
	Moderate	63	46.3
	Severe	39	28.7
	<b>TOTAL</b>	<b>136</b>	<b>100</b>

**Table 8:** Mean Values for Challenges faced by the building codes in rural areas of Pakistan

Observed Variables	Mean	Std. Dev.	N
(BCR-1) Lack of national/provincial/local buildings standards	3.76	1.000	136
(BCR-2) Lack of national/provincial/local building regulations	3.70	0.976	136
(BCR-3) Lack of Product certification in the market	3.74	1.142	136
(BCR-4) Mismatch between national standards and standards of imported material	3.77	1.088	136
(BCR-5) Lack of experts/ expertise	3.99	0.911	136
(BCR-6) Lack of awareness	3.84	1.005	136
(BCR-7) Lack of finance	3.94	0.980	136
(BCR-8) Monitoring and Enforcement	3.73	1.099	136

As mentioned in the table below, a Pearson correlation was drawn to determine the correlation among these variables. The correlation coefficient indicates that there is a significant correlation between all the variables; however, BCR-1 “Lack of building standards on a national, provincial and local level,” BCR-2 “Lack of building regulations on the national, provincial and local level,” BCR-3 “Lack of product certification in the market” and BCR-4 “Mismatch between national standards and standards for imported materials” establishes the most prominent correlation with each other.

**Table 9:** Correlation of the observed variables of challenges faced by the building codes

	BCR-1	BCR-2	BCR-3	BCR-4	BCR-5	BCR-6	BCR-7	BCR-8
<b>BCR-1</b>	<b>1</b>							
<b>BCR-2</b>	.812**	<b>1</b>						
<b>BCR-3</b>	.834**	.787**	<b>1</b>					
<b>BCR-4</b>	.827**	.806**	.775**	<b>1</b>				
<b>BCR-5</b>	.533**	.524**	.558**	.518**	<b>1</b>			
<b>BCR-6</b>	.423**	.378**	.350**	.389**	.501**	<b>1</b>		
<b>BCR-7</b>	.451**	.396**	.424**	.439**	.539**	.492**	<b>1</b>	
<b>BCR-8</b>	.495**	.575**	.548**	.550**	.528**	.474**	.452**	<b>1</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed)

### Analysing Improvement in Building Codes in rural areas of Pakistan

After realizing the effectiveness of building construction standards and their challenges, it is vital to understand the measures for improvement. Based on the literature review, this leading construct is developed to look at the remedial actions to improve it. The construct contains five observed variables evolved from the literature study. From the table above, it is noticeable that all these five measures naming IBS-1 “Harmonize some priority building standards,” IBS-2 “Develop guiding document of good practices on monitoring and enforcement of building standards,” IBS-3 “Develop minimum acceptable standards for adequate & healthy built environment Planning,” IBS-4 “Establish a provincial platform to develop, collect and analyze housing standards” and IBS-5 “Establish a database and network of experts in the area of building standards by province and by field” are rated by the respondents as severely critical giving more than 70% of the affirmation. It is illustrated by the mean value table mentioned below, with a mean value of approximately 4.

**Table 10:** Responses for Improvement in building codes in rural areas of Pakistan

Code	Observed Variables	Frequency	Percent
<b>IBS-1</b>	<b>Harmonize some priority building material standards</b>		
	None	-	-
	Very Mild	5	3.7
	Mild	28	20.6
	Moderate	61	44.9
	Severe	42	30.9
<b>IBS-2</b>	<b>Develop a guiding document of good practices for monitoring and enforcement</b>		
	None	1	0.7
	Very Mild	9	6.6
	Mild	19	14.0
	Moderate	69	50.7
	Severe	38	27.9
<b>IBS-3</b>	<b>Develop minimum acceptable standards for adequate &amp; healthy built environment planning</b>		
	None	-	-
	Very Mild	9	6.6
	Mild	19	14.0
	Moderate	65	47.8
	Severe	43	31.6
<b>IBS-4</b>	<b>Establish a regional platform to develop, collect and analyze housing standards</b>		
	None	1	0.7
	Very Mild	14	10.3
	Mild	17	12.5
	Moderate	62	45.6
	Severe	42	30.9

<b>IBS-5</b>	<b>Establish a database and network of experts in the area of building standards by province and by field</b>		
	None	-	-
	Very Mild	10	7.4
	Mild	23	16.9
	Moderate	56	41.2
	Severe	47	34.6
	<b>TOTAL</b>	<b>136</b>	<b>100</b>

**Table 11:** Mean Values for Improvement in building codes in rural areas of Pakistan

Construct	Mean	Std. Dev.	N
<b>IBS-1</b>	4.03	0.816	136
<b>IBS-2</b>	3.99	0.869	136
<b>IBS-3</b>	4.04	0.851	136
<b>IBS-4</b>	3.96	0.957	136
<b>IBS-5</b>	4.03	0.902	136

From the above responses, it is evident that all the variables in measures to be taken for improving building standards and their effectiveness are equally essential. As exhibited below, Pearson correlation was calculated to reinforce their relationship using SPSS V 24. According to the correlation table, all the variables bear significant correlations amongst each other, with values exceeding .690 positively.

**Table 12:** Correlation of the observed variables for improvement in building codes

	<b>IBS-1</b>	<b>IBS-2</b>	<b>IBS-3</b>	<b>IBS-4</b>	<b>IBS-5</b>
<b>IBS-1</b>	<b>1</b>				
<b>IBS-2</b>	.774**	<b>1</b>			
<b>IBS-3</b>	.745**	.732**	<b>1</b>		
<b>IBS-4</b>	.770**	.818**	.694**	<b>1</b>	
<b>IBS-5</b>	.753**	.690**	.741**	.748**	<b>1</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### **Correlating Dynamics of Building Codes in Pakistan**

A Pearson Correlation coefficient was analyzed through SPSS V24 in the following table to develop a deeper understanding of the three dimensions of building standards and regulations. Interestingly, the Challenges have a strong and positive correlation with the improvement, while the other two are significant but negative.

**Table 13:** Correlation of the leading constructs

	Challenges in Building Codes	Effectiveness of Building Codes	Improvement in Building Codes
Challenges in Building Codes	<b>1</b>		
Effectiveness of Building Codes	-.217*	<b>1</b>	
Improvement in Building Codes	.647**	-.231**	<b>1</b>

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## DISCUSSION

This study identifies the vital factors to determine the quality, minimum safety, and health standards in buildings. Codes are the essential source and a regulatory instrument to guide planning, design, and construction. The study of building codes in Pakistan is divided into three leading constructs: effectiveness of building codes, challenges to building codes, and improvement in building codes. Similarly, the results suggest that the effectiveness of the building construction standards in rural areas of Pakistan lacks the adoption of standards and building codes by the municipalities. The survey findings illustrate that local bylaws, regulations, and municipality technical requirements are not followed. There is one standard for planning called the National Reference Manual on Planning and Infrastructure Standards, developed in 1986, while several other building codes like the Seismic code of 2007, Energy code of 2011, Climate Change policy of 2012, Disaster Risk reduction policy of 2013, Electric and telecom code of 2014 and Fire Safety provisions of 2016. Implementing these codes is not committed by any municipality in rural areas of Pakistan. This result is in line with the findings from the literature review.

The results indicate numerous challenges, including a lack of building standards, building regulations, product certification, experts, knowledge, and finance, and the mismatch between local and imported materials standards. The survey also revealed that monitoring and enforcement are facing severe challenges. Furthermore, the results explain that the measures to be taken to improve building standards and their effectiveness include developing a good practice guidance document, minimum performance standards, a regional platform for standards, and a national expert database on building standards. The study displays that all of these areas need severe attention for the resilient rural communities of Pakistan. Additionally, it relates to Improving the building code development, application, and enforcement concerns for transforming the legal interface and bringing health and safety to citizens.

Lastly, the results demonstrate that Pakistan's building codes are insufficient in their development, adoption by municipalities, enforcement, and

compliance. It is parallel with the literature review conducted in the study. The results of this study support the findings and constructs from the previous works that have confirmed that there is a deficit in the adoption of building standards and regulations by the municipalities, a lack of technical cadres on a local level, and weak monitoring and evaluation system in Pakistan.

## **CONCLUSION**

In recent years, has been a growing concern that the construction in rural areas of Pakistan does not follow the building codes. Building codes are a primary ingredient for achieving resilience in the built environment which relies on adopting a comprehensive strategy for engaging public and private sectors in building construction. Moreover, data were collected from respondents, mainly architects, planners, and engineers, through a survey instrument to investigate the dimensions. Findings from this study present the dimensions to be embraced by policymakers, PEC, PCATP, architects, planners, and engineers in achieving enforcement and adoption of the building codes in rural areas of Pakistan. Additionally, it is evident that all researches contain limitation(s), and this endeavor is not an exception. Therefore, in this study, data were collected from 136 subjects, where the sample size is acceptable for empirical study; however, data collection from more subjects to enhance the robustness and validity of the statistical results. In addition, the sphere of the population can be extended to city councils, local administration, and code enforcement agencies will improve the generalization of the results accordingly.

## **RECOMMENDATION**

As a result, identifying strategies for future risks and code development supportive of risk adoption is required. Apart from that, cooperation on risk resilience guidelines and exploring the rapport with spatial planning for better and safe zoning. It is essential to enhance awareness of building codes and understanding of risk to the policymakers, the general public, and building construction stakeholders. Similarly, assistance for research on climate science, aligning resilience, and building construction with future disasters shall be provided. Improving risk and impact analysis to realize social and economic benefits through investment in resilience is imperative. Moreover, professionals from the building construction industry shall work with climatologists, regulators, and policymakers to establish an appropriate, authoritative and reliable methodology to address climate risks.

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**Appendix (Questionnaire Items)**

**SECTION A: GENERAL INFORMATION**

*In this section, please tick only one box for each of the questions*

Q1. Please state your profession:

Architect [ ] Engineer [ ] Developer [ ]

Q2. How long have you been working with your planning authority?

1-5years [ ] 6-10years [ ] 11-15 years [ ] 16-20years [ ] more than 20 years

**SECTION B: BUILDING CODES IN PAKISTAN**

Q1. In your opinion, please rate the effectiveness of building construction standards in rural areas.

*1- Not effective, 2- sometimes effective, 3- frequently effective, 4- mostly effective, 5- always effective*

		1	2	3	4	5
1	Planning, infrastructure, and building standards					
2	Building standards and codes					
3	Local Building Byelaws and Regulations					
4	Technical requirements for buildings					
5	National Reference Manual on Planning & Infrastructure Standards 1986					
6	Building Code of Pakistan (Seismic Provisions 2007)					
7	Building Code of Pakistan (Energy Provisions 2011)					
8	National Climate Change Policy 2012					
9	Disaster Risk Reduction Policy 2013					
10	Pakistan Electric and Telecommunication Code 2014					
11	Building Code of Pakistan (Fire Safety Provisions 2016)					

**SECTION C: CHALLENGES FACED BY BUILDING CODES**

Q2. Please rate the major challenges in construction codes that the building sector faces in rural areas.

*1-None, 2-Very Mild,3- Mild,4- Moderate, 5-Severe*

		1	2	3	4	5
1	Lack of national/ Provincial/ Local building standards					
2	Lack of national/ Provincial/ Local building regulations					
3	Lack of product certification in the market					
4	The mismatch between national standards and standards for imported materials					
5	Lack of experts/expertise					
6	Lack of awareness					

7	Lack of finance					
8	Monitoring and Enforcement					

**SECTION D: IMPROVEMENT IN BUILDING CODES**

Q3. In your opinion, please indicate the measures to improve building codes and their effectiveness.

*1-None, 2-Very Mild, 3- Mild, 4- Moderate, 5-Severe*

		1	2	3	4	5
1	Harmonize some priority building materials standards					
2	Develop a guiding document of good practices for monitoring and enforcement					
3	Develop minimum acceptable standards for adequate and healthy built environment planning					
4	Establish a regional platform to develop, collect and analyze housing standards					
5	Establish a database and network of experts in the area of building standards by country and by field					

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