SOCIO-ECONOMIC IMPACT ASSESSMENT (SEIA): BALANCING BETWEEN THE DEVELOPMENT AND A DECENT LIFE IN BUKIT RAJA, KLANG, SELANGOR

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ABSTRACT

This study provides an insightful exploration of the practical implementation of Socio-economic Impact Assessment (SEIA) as a valuable tool during the implementation of Environmental Impact Assessment (EIA). The primary aim of this SEIA is to ascertain and evaluate the potential socio-economic and cultural impacts of proposed changes on the lives and circumstances of people. The study was conducted within a 5 km radius from the proposed plant location situated at Kawasan Perindustrian Bukit Raja, Klang, District of Klang, Selangor Darul Ehsan. This paper examines the detailed demographic background of respondents, property ownership, infrastructure and basic amenities availability, level of awareness and knowledge of the proposed project, perceptions towards the proposed project, and perceptions of impacts on health and safety, aesthetics and culture, basic utilities, and amenities, as well as an assessment of the level of acceptability. The research utilized a quantitative method through a cross-sectional study using surveys. The study found that more than 90.0% of respondents believe the proposed project will be beneficial to them. However, several significant issues were highlighted by the respondents, such as traffic congestion with 43.0%, increased noise pollution (29.0%), and elevated air/dust pollution is the most concerning the respondents with 54.0%. Therefore, it is crucial for any development project to implement a mitigation plan to minimize socio-economic impacts. SEIA is essential for gathering and engaging with relevant stakeholders regarding any development. The SEIA aligns with Sustainable Development Goal (SDG) 11, which focuses on making cities and human settlements inclusive, safe, resilient, and sustainable.

Keywords: Development, Decent Life, Socio-Economic Impact Assessment (SEIA), Sustainable Development Goals (SDG). Bukit Raja.

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1. INTRODUCTION

Socio-economic impact assessment (SEIA) is a valuable tool for stakeholders to understand the potential range of impacts resulting from a proposed change and the likely responses of those affected by it. The scope and ambition level of a SEIA can vary depending on the environmental problem at hand and the availability of data. The chosen ambition level primarily influences the depth and detail of the impact analysis. Conducting a SEIA provides a clear and structured presentation of the various effects of a proposed project (Hjortsberg, 2019). Recent studies have highlighted the importance of SEIA in various sectors. For instance, Kachali et al. (2023) conducted a study in Kenya and Nigeria examining the social and economic effects of solar mini-grids in rural African settings. That study found significant improvements in economic activities, productivity, and gender equality among connected households and businesses, underscoring the transformative potential of renewable energy projects.

Additionally, Hinkel et al. (2024) investigated the long-term economic impact of sea-level rise on coastal regions in Europe, focusing on Gross Domestic Product (GDP). The findings revealed that current sea-level rise has already negatively influenced the GDP of coastal regions, leading to cumulative losses. This underscores the necessity of incorporating comprehensive socio-economic analyses in environmental assessments to inform effective adaptation strategies. These recent studies demonstrate the critical role of SEIA in understanding and mitigating the socio-economic impacts of environmental changes and development projects. By tailoring the scope and ambition of SEIAs to the specific context and data availability, stakeholders can ensure a thorough analysis that supports informed decision-making and promotes sustainable development.

The SEIA is widely used at international level and for example among the development project that was benefit the SEIA is a road tunnel in the Trollaskagi Peninsula in Northern Iceland and the Karahjukar hydro project in eastern Iceland (Eythorsson, Johannesson and Olafsson, 2015) Another well-known example of SEIA in an international project is the Lesotho Highland Water Project (LHWP) in South Africa (Kotelo-Molaoa, 2007, Letsebe, 2012). The LHWP is one of the largest infrastructure projects in Africa, aimed at providing water to South Africa and generating hydroelectric power for Lesotho. It involved building dams, tunnels, and infrastructure across the Lesotho Highlands. The project required a thorough SEIA due to its scale and potential effects on local communities. By evaluating the anticipated consequences of a project for society and its participants, it is possible to compare different proposed options. SEIA is crucial in illustrating the socioeconomic conditions within a community and understanding how they have reacted to the proposed project affecting their environment.

A SEIA is vital for identifying potential impacts and proposing mitigation plans for a project. It is often mandated by internal and external requirements as part of the proposal development process to support decision-making. However, SEIA should be viewed as one of several tools to inform decisions rather than the sole determinant. Recent studies emphasize its growing role in the Environmental Impact Assessment (EIA) process. For instance, Vanclay (2022) highlights SEIA's importance in understanding the broader implications of development projects on communities and economies. The role of SEIA is important in identifying changes in income levels, employment, service access, and quality of life (Hinkel et al. 2024; Waterson 2014; Bureau of Rural Sciences 2005). This enables the development of strategies to mitigate negative effects while enhancing positive outcomes.

2. LITERATURE REVIEW

Historically, EIA has concentrated on the direct and indirect biophysical impacts of proposed developments, including effects on water, air, land, flora, and fauna. However, recent advancements in EIA practice and literature have emphasized the growing importance of evaluating industrial development's broader societal, cultural, and economic impacts. This shift reflects a holistic approach to sustainability and acknowledges the interconnectedness of ecological and human systems (Bond et al., 2022). Furthermore, new frameworks now integrate social impact assessments (SIA) within EIAs, ensuring that community well-being and cultural heritage are considered alongside environmental concerns (Vanclay, 2022).

The United Nations Environment Programme (UNEP) defines EIA as a tool used to identify the environmental, social, and economic impacts of a project prior to decision-making, aiming to predict environmental impacts at an early stage in project planning and design. SIA has become an integral component of the EIA process, focusing on analyzing, monitoring, and managing the intended and unintended social

consequences of planned interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment. The inclusion of SEIA within the EIA framework ensures that potential changes caused by industrial development activities—directly or indirectly, for better or worse—are identified and addressed.

Any development can impact human quality of life and well-being. People may experience a decline in quality of life if they are unable to adapt to socio-economic, institutional, and environmental changes. Based on this premise, this paper aims to analyze the socio-economic impact on residents in the area due to the proposed extension of the aluminum recycling processing factory located in Bukit Raja Industrial Zone, Klang, Selangor. This study uniquely contributes to SEIA literature in Malaysia as there is little study been carried out in this field and will assist the researchers and consultants in that discipline to gain more insight. This approach emphasizes the importance of considering impacts on society, culture, and different forms of economic activity alongside traditional environmental concerns.

Measuring and evaluating social and economy impacts towards the livelihood of society has been gaining importance over the years. In this regard, for example, the United States Environmental Protection Agency (2017) indicates that sustainability manufacturing is based on at least two of these elements: economic, social or environmental. Alomoto, Ninerola and Pie (2021) did conduct a systematic literature review on this assessment and they found out the significance trend and development in this area.

There are several definitions of SEIA. Mackenzie (2007) defines SEIA as a systematic analysis conducted during EIA to identify and evaluate a proposed development's potential socio-economic and cultural impacts on the lives and circumstances of individuals, families, and communities. If these potential impacts are significant and adverse, SEIA can assist developers and other stakeholders in finding ways to mitigate, remove, or prevent these impacts. Conversely, Edwards (2011) points out that SEIA examines how a proposed development will alter the lives of current and future residents of a community. The Review Board’s definition of SEIA underscores the importance of the interconnections between people, culture, economic activities, and the biophysical environment. The objectives of SEIA may range from merely reducing the negative effects of actions on people to maximizing their positive benefits and contributing to sustainable development.

In any development context, SEIA serves as a tool to identify and distinguish numerous measurable impacts of a proposed development, although not every impact may be significant. The people affected, whether directly or indirectly, have a role in determining whether impacts on valued socio-economic components are significant. SEIA is useful for understanding the potential range of impacts from a proposed change and the likely responses of those affected. It can assess impacts from a broad spectrum of changes, from constructing a new freeway to altering access to natural resources such as forests or oceans. This understanding helps design impact mitigation strategies to minimize negative effects and maximize positive outcomes.

While SEIA typically focuses on avoiding adverse impacts, it also provides a platform for planning how to enhance the beneficial impacts of a proposed development. Beneficial impacts can include: (i) improved living standards due to increased access to employment, business opportunities, training, and education; (ii) enhanced community accessibility; and (iii) increased funding to improve social infrastructure and cultural maintenance programs. Specifying how adverse impacts might interact with beneficial impacts and identifying management strategies for these impacts are crucial steps in SEIA.

As Mackenzie (2007) highlighted, SEIA's goals may range from reducing the negative effects of actions on people to maximizing their positive benefits and contributing to sustainable development. The concepts employed in SEIA derive from various social disciplines, including economics, sociology, geography, anthropology, and political science. A key challenge in SEIA is understanding the nature of social or economic impacts. An impact is a change in conditions resulting from a development, such as a road or a mine. Generally, socio-economic impacts refer to changes in the human condition, including economic and social conditions of local communities, vulnerable groups (such as women, children, or the poor), businesses, employees, districts, provinces, or even nations. Although health and cultural impacts (e.g., language loss) are also subjects of SEIA, they may not always be explored in depth, as they may require specialized studies. Social and economic impacts may each necessitate specific studies and analyses using different techniques.

Table 1 presents examples of valued socio-economic components and associated issues. SEIA examines these valued socio-economic components prior to determining whether and how these valued socio-economic

components may interact with the components of a proposed development.

Table 1: Valued Socio-Economic Components and Issues

Valued Socio-Economic Component	Issues
Health and well-being	• Individual and population health • Community and cultural group cohesion • Family cohesion • Cultural maintenance
Sustainable wildlife harvesting, land access and use	• Housing trapping and gathering – a traditional ceremony • Recreational and traditional economy – access to land • Value of alternative land uses (e.g. tourism vs. hunting vs. industry
Protecting heritage and cultural resources	• The aesthetic, cultural, archaeological and spiritual value of places • Maintenance of traditional language, education, laws, and traditions
Equitable business and employment opportunities	• Local, regional, and territorial business competitiveness • Employment opportunities for local, regional, and territorial residents • Training and career development for local, regional, and territorial residents • Avoidance of boom-and-bust cycles (e.g. via economic diversification
Population sustainability	• In-and-out migration effects •Change in the social and cultural makeup of affected communities
Adequate services and infrastructure	• Pressures on social services such as health care, education, and justice • Housing pressures – affordability, availability, and appropriateness • Traffic and road safety – pressures on physical infrastructure
Adequate, sustainable income and lifestyle	• Overall amount of money in the community • Uses of money in the community – effects of increased disposable income • Local and regional cost of living • Distribution of costs/benefits among affected people-impact equity • Adverse lifestyle changes – increased gambling, crime, substance abuse

(Source: Mackenzie, 2007 and Mackenzie, 2010)

To carry out SEIA, several steps need to be considered. According to Johnson (2006), these generally include: i) scoping the nature and boundaries of the impact assessment; ii) profiling the current impacts of the activity being examined, including the historical context or current status to establish a baseline level and rate of change for relevant variables related to the activity of interest; iii) formulating alternatives, where alternative 'impact' scenarios are developed; iv) projecting and estimating the effects of different impact scenarios; v) monitoring actual impacts; vi) mitigating and managing impacts; and vii) evaluating the impact assessment process. Meanwhile, Vis, Dornbrack, and Haye (2014) describe the steps in these assessments as: (1) scoping and issue identification, (2) determining the social and economic baseline, (3) predicting and analyzing impacts, (4) determining significance, (5) mitigation, management, and monitoring.

From another perspective, the steps in conducting SEIA can be summarized as follows:

a. Scoping - A preliminary analysis that identifies and prioritizes SEIA considerations and required information. Early and effective scoping narrows the focus of SEIA to issues of potential significance.
b. Profiling Baseline Conditions - Focuses on gathering information about the socio-economic environment and context of the proposed development. This includes defining measurable indicators of valued socio-economic components.
c. Predicting Impacts - This step involves predicting possible socio-economic impacts based on the analysis of information gathered from scoping, baseline profiling, and past experiences. This analysis includes identifying trade-offs between the adverse and beneficial impacts of a proposed development.
d. Identifying Mitigation - Predicted adverse impacts require mitigation. Mitigation includes strategies, plans, and programs to reduce, avoid, or manage impacts.
e. Evaluating Significance - Involves determining whether a proposed development is likely to cause significant adverse impacts on valued socio-economic components. The proposed development may not be approved if appropriate mitigation measures cannot be identified.
f. Applying Mitigation and Monitoring - Effective mitigation for socio-economic impacts requires robust

monitoring programs (also known as "follow-up") to ensure that mitigation measures are working effectively and are adapted as needed.

Another main step included in the SEIA process, as proposed by Mackenzie (2007), are: i) Scoping and Issues Identification: The proposed project must be well-defined. Social and economic issues must be identified, as well as the geographic and temporal study boundaries; ii) Determining the Social and Economic Baseline: There must be a thorough understanding of the impacted community or communities and the general socio-economic conditions in the project area; iii) Predicting and Analyzing Impacts: The assessment must project the potential social and economic impacts, including the effects of potential interactions between factors and over the lifetime of the development; iv) Determining Significance: There must be an assessment of the importance of the social and economic impacts of the project; and v) Mitigation, Management, and Monitoring: Once impacts and their significance are understood, decisions must be made about whether the project should proceed. If so, measures must be identified to avoid or lessen negative impacts (mitigation) and maximize positive impacts. Management of the mitigation must occur, and ongoing monitoring of the project's effects must be conducted to ensure thresholds are not exceeded.

In Malaysia, SEIA is part of the EIA process, as stipulated by the Environmental Impact Assessment Guideline in Malaysia, published by the Department of Environment (DOE) in 2016. Socio-economic impact is among the baselines mentioned in the Guideline. It covers several variables, such as demography, development needs and potential, infrastructure facilities, and economic activities (DOE, 2016). In Malaysia, EIA is conducted to fulfil the requirements under Section 34A (2c) of the Environmental Quality Act 1974 and the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, which has been gazetted and enforced since August 28, 2015 (DOE, 2016).

3. METHODOLOGY

The method for determining the sample size employs the calculation method proposed by Roscoe (1975), which suggests that a suitable sample size for random studies ranges between 30 and 500 respondents. For this study, a total of 100 samples were selected to represent respondents' perceptions of the proposed housing project. Conroy (2016) notes that most statisticians agree that a minimum sample size of 100 is required to obtain meaningful results.

Additionally, published tables can be used to determine sample sizes based on specific criteria. These tables provide the necessary sample sizes for various precision, confidence level, and variability combinations. Glenn (1992) demonstrated in Table 2 that, with a precision level of 10% and a confidence level of 95%, the minimum sample size should be 100 for populations larger than 100,000.

Table 2: Sample size for 5% and 10% precision levels where confidence level is 95% and P=0.5

Size of Population	**Sample Size (n) for precision (e)**	
	±5%	**±10%**
500	222	83
1,000	286	91
2,000	333	95
3,000	353	97
4,000	364	98
5,000	370	98
7,000	378	99
9,000	383	99
10,000	385	99
15,000	390	99
20,000	392	100
25,000	394	100
50,000	397	100
100,000	398	100
>100,000	400	100

(Source: Glenn, 1992)

Samples were selected based on the number of household heads in each study area. Choosing household heads as study samples helps avoid bias, as selecting individuals according to the population might result in over-representation from the same household. According to the Census (2020), Bukit Raja has a population of 146,534, indicating that the minimum sample size for this study should be 100 respondents.

Table 3 shows that 73% of the sample size was obtained from areas less than 3 km from the proposed project, referred to as Zone of Impact 1 (ZoI 1). This area is likely to experience a direct impact from the development. The remaining 27% of the sample was collected from areas within 3 to 5 km of the project, referred to as Zone of Impact 2 (ZoI 2), which is expected to experience indirect impacts from the development.

Table 3: Numbers of respondents according to residential area in ZoI 1 and ZoI 2

ZoI 1 (1-3 km)		**ZoI 2 (3-5 km)**	
Residential Area	Respondents	Residential Area	Respondents
Flat Cempaka	12	Bandar Bukit Raja	2
Flat Dahlia	5	Bukit Jati	2
Flat Mawar	9	Eco Ardence	2
Jalan Kasawari	2	Kg Bukit Kuda	2
Jalan Kelicap	3	Kg Padang Jawa	2
Kg Batu Belah	4	Kg Sungai Pinang	1
Kg Sungai Pinang Dalam	1	Rimba Jaya	2
Mutiara Bukit Raja	6	Setia Alam	5
Pangsapuri Kristal View	2	Taman Cempaka	5
Palm Garden	5	Taman Sentosa	2
Pasar Besar Meru	6	Taman Teluk Pulai	2
Taman Bunga Melor	3		
Taman Eng Ann	3		
Taman Meru	6		
Taman Sri Pekan	4		
Taman Haji Ismail	2		
Total	73		27
Overall	**100**		

3.1 Study Approach

The methodology used in a study is crucial for collecting accurate information and data. For this study, two approaches will be employed to assess the potential socio-economic impacts of the proposed project: a comprehensive social survey and stakeholder consultations with key respondents.

3.2 Comprehensive Social Survey

A questionnaire survey was conducted using purposive sampling to select 100 respondents randomly from residential areas within Zone of Impact 1 (ZoI 1) and Zone of Impact 2 (ZoI 2). The field survey took place between 08-10 September 2023 and included respondents from residential areas within a 5 km radius of the proposed project.

The questionnaire was designed to gather the following information:

- Detailed demographic background of respondents
- Property ownership, including vehicles, household items, and other assets
- Availability of infrastructure and basic amenities
- Level of awareness and knowledge
- Perception of the proposed project
- Perception of impacts on health and safety, aesthetics and culture, basic utilities, and amenities
- Assessment of the level of acceptability

3.3 Key Respondent Consultation

In addition, interviews were conducted with key respondents, specifically community leaders, to gauge their opinions and perceptions. A series of discussions with community leaders took place during the fieldwork period from 08-10 September 2023. These discussions facilitated face-to-face interactions between the key respondents and the socio-economic consultant. The purpose was to provide community leaders with a clearer perspective on the project and address any issues of concern. For the purposes of this study, the discussions focused on:

- Key respondent interviews and analysis of historical performance to assess the capacity of education, health, and other systems to accommodate an increased population during the construction and operational phases of the project.
- Data analysis and key respondent interviews regarding the proposed extension of limestone quarry operations.
- Analysis of the detailed demographic background of respondents, including property ownership and availability of infrastructure and basic amenities.
- Perceptions of the proposed project, including impacts on health and safety, aesthetics and culture, and basic utilities and amenities.
- Level of awareness and knowledge, and assessment of the level of acceptability.

3.4 Challenges and Weaknesses in SEIA Methodology

While SEIA plays a crucial role in promoting sustainable development, it has several challenges and weaknesses. These challenges highlight the need for refining and enhancing the SEIA methodology to improve its effectiveness in promoting sustainable development while addressing the complex and multifaceted issues that arise from policies and programs.

Table 4: The challenges and weakness in SEIA Methodology

	Challenges	**Weakness**
Lack of Clear Guidelines and Standards	Flexibility	The absence of standardized methodologies makes it difficult to implement SEIA consistently across different regions and sectors.
Inadequate Capacity, Time and Resources	Quality	The quality of the SEIA may be compromised, leading to incomplete or rushed assessments.
Inadequate Data and Information	Reliability	SEIA relies on comprehensive data yet difficult to obtain.
Limited Integration with Decision-Making	Limited Impact	SEIA is often conducted as a separate exercise.
Overemphasis on Environmental Impacts	Sustainability	Traditional SEIA tends to focus primarily on environmental impacts, overlook sustainability goals that include social equity, economic resilience, and cultural aspects.
Stakeholder Engagement Challenges	Acceptability	Limited public participation. Lack of trust of the final assessments.
Political and Institutional Influence	Integrity	Assessments do not accurately reflect environmental impacts.

Table 4 highlights five key challenges in the methodology: flexibility, quality, reliability, integrity, sustainability, acceptability along with issues related to limited impact. However, two main challenges were encountered in conducting this study. The first challenge was time constraints, as the researcher had limited time to carry out the survey. The second challenge was related to limited funding allocated by the EIA consultant for the execution of the survey.

One of the weaknesses in this study were on data precision. Due to resource limitations, the survey results have a higher margin of error, with a precision level of ±10%. Higher precision (e.g., ±3%): Requires larger sample sizes and more resources (time and money). Lower precision (e.g., ±10%): Achievable with smaller sample sizes, but results are less reliable. In our case, the ±10% precision level is due to resource limitations, meaning the survey results may be less accurate and have a wider margin of error. The precision level of ±10% reflects the maximum achievable accuracy given the constraints of the budget allocated by the industry. While this may result in less

accurate data, it represents the largest possible sample size that could be collected within the available resources. This acknowledges the limitation while highlighting the effort to maximize data collection under the circumstances. Increasing the number of respondents would incur higher costs, which exceeds the current budget.

However, certain industry areas share similar issues, as observed through past experiences and historical living conditions. This suggests that feedback from a limited sample can still reflect common concerns in these areas, providing useful insights despite the survey's precision limitations. This highlights the cost constraint while justifying the use of existing knowledge and similarities across areas to compensate for a smaller sample size. Research within the industry is often constrained by limited budgets and tight timelines, which can impact the reliability of findings. Therefore, it is essential for individuals conducting the research and preparing the report to possess extensive experience and a deep understanding of socio-economic impacts. To ensure quality and credibility, only registered subject matter specialists under the EIA are authorized to undertake such work. These specialists must meet stringent criteria: a minimum of 3 years of experience for PhD holders, 5 years for Master's degree holders, and 7 years for Bachelor's degree holders. These requirements ensure that only qualified experts with sufficient expertise can conduct the research and produce reliable reports. These subject matter specialists must also maintain Continuing Professional Development (CPD) hours by attending annual courses to renew their registration. This ensures they stay updated on current issues and evolving scenarios within the industry, maintaining their relevance and expertise.

4. RESULTS AND DISCUSSIONS

4.1 Social Profile of the Study Area

This section examines the existing human environment, including the population profile and socio-economic activities within the study area. It also describes and assesses the current facilities, amenities, and well-being of the local community residing near the proposed project site. The objective is to outline the human environment so that the project's potential environmental impacts can be evaluated within the context of the current conditions. The study also investigates and evaluates public awareness and perceptions regarding the proposed project and its potential impacts on their socio-economic environment.

4.2 Demographic Characteristic

Table 4 displays the demographic background of the respondents. The study found that over one-third of the respondents were husbands (49.0%), while 27.0%, 9.0%, and 15.0% were represented by wives, family members, and single KIR, respectively. The majority of respondents in this survey were Malay (74%), followed by Chinese (20%), with the remaining 6% being Indian.

Education is a key component of social class, directly and indirectly influencing individuals. Directly, individuals from higher social classes are more likely to attend prestigious schools and consequently receive higher levels of education. Education also imparts essential knowledge, including basic facts, job skills, and cultural norms. Importantly, education enhances personal lives and contributes to the smooth functioning of society. The study findings revealed that nearly 100% of respondents had received formal education. The majority indicated having completed upper secondary education, representing 62.0% of respondents. Additionally, 19.0% were attending university, 8.0% had completed lower secondary education, 6.0% were enrolled in college or institutions, and 5.0% had received primary education (Table 4). Overall, the data indicates that most of the population in the area has received formal education.

Table 4: Respondents' Demographic Background

Type	Percentage (%)	Race	Percentage (%)
Husband	49.0	Malay	74.0
Wife	27.0	Chinese	20.0
Family Member	9.0	Indians	6.0
Single	15.0		
Education levels	**Percentage (%)**	**Age**	**Percentage (%)**
Primary education	5.0	21-30 years old	25.0
Lower secondary	8.0	31-40 years old	26.0

Upper Secondary	62.0	41-50 years old	21.0
College/Institute	6.0	51-60 years old	18.0
University	19.0	61-70 years old	6.0
		71-80 years old	4.0

(Source: Fieldwork, September 2023)

Respondents' occupational profiles are crucial in socio-economic studies. Respondents' employment status within the study area is largely influenced by their educational level, expertise, and available employment opportunities. According to Table 5, the majority of respondents were businessmen (35.0%), followed by those employed in the private sector (34.0%).

Table 5: Respondents' Occupational profile

Occupation	Percentage (%)
Unemployment	11.0
Construction Labour	1.0
Businessman	35.0
Public Sector Employee	7.0
Private Sector Employee	34.0
Housewife	3.0
Student	1.0
E-hailing driver	6.0

(Source: Field survey, September 2023)

4.3 Mobility and Migration

Table 6 presents the reasons why respondents moved to the study area. The findings indicate that more than half of the respondents have been living in the area for over 10 years. Sixty-six percent of them are originally from Selangor, while only 34 percent come from other states. Among the respondents, 43.0 percent are locals. Additionally, 29.0 percent moved to the area in search of employment, and 10.0 percent relocated due to their spouse. Local residents constitute the largest portion of the respondents (43.0%).

Table 6: Length of domiciliation and respondent's origin before moving to study area

Length of stay	Percentage (%)	State of Origin	Percentage (%)	Reason of migration	Percentage (%)
<10 years	18	Selangor	66	Local people	43
10-20 years	37	Other States	34	Looking for Job	29
21-30 years	32			Transfer	8
>30 years	13			Following spouse	10
				Following family	4
				Schooling	1

(Source: Field survey, September 2023)

4.4 Ownership

Amenities significantly influence property choices and can enhance the appeal of real estate, contributing to the occupants' pleasure and enjoyment. Additionally, amenities play a crucial role in providing a high quality of life. Table 7 illustrates the housing conditions, utilities, and amenities. The type of housing unit occupied and owned reflects the nature of the respondents' settlements. The survey revealed that nearly half of the respondents (64.0%) live in their own homes. Of the respondents, 44.0% own apartment houses, while 41.0% own terrace houses. According to observations and survey analysis, most of the houses are in moderate condition (61.0%), with an additional 39.0% in good condition.in is deemed to be in a moderate (61.0 %). Another 39.0 percent have a good condition.

Table 7: Statistics of Housing Condition, Utilities and Amenities (%)

Items	Percentage (%)	Item	Percentage (%)
Household ownership:		**Housing condition:**	
Own house	64.0	New/good	39.0
Rented house	34.0	Fair/moderate	61.0
Quarters	2.0		
Type of house:		**Vehicle:**	
Terrace	41.0	Car	68.0
Shop lot	4.0	Motorcycle	26.0
Flat/Apartment	44.0	None	6.0
Semi-D	6.0		
Bungalow	5.0		

(Source: Field survey, September 2023)

The facilities and amenities available in Bukit Raja Klang and its surroundings are fundamental to residents' decision to settle in the area. They play a significant role in property selection. High-quality facilities and amenities have the potential to foster community cohesion. Understanding the existing facilities in the study area is crucial for assessing the socioeconomic status of the local community.

Table 8: Availability of services and their efficiency as perceived by the respondents

Types of facilities	Perceived level of satisfaction			
	Satisfactory	Moderate	Unsatisfactory	Total
Electricity	75.0	25.0	0.0	100.0
Water	64.0	31.0	5.0	100.0
Post office	63.0	34.0	3.0	100.0
Clinic	66.0	32.0	2.0	100.0
Hospital	64.0	34.0	2.0	100.0
Road network	46.0	36.0	18.0	100.0
Bus services	59.0	36.0	18.0	100.0
Taxi/services	64.0	17.0	19.0	100.0
Markets	66.0	31.0	3.0	100.0
Shops	66.0	31.0	3.0	100.0
Place of worship	70.0	29.0	1.0	100.0
Waste collection	63.0	34.0	3.0	100.0
Fire brigade	65.0	33.0	2.0	100.0
Policing	65.0	33.0	2.0	100.0
Entertainment	65.0	29.0	6.0	100.0
Sports and recreation	56.0	37.0	7.0	100.0
Overall development	58.0	39.0	3.0	100.0

(Source: Field survey, September 2023)

The findings indicate that the majority of respondents were aware of the availability of various utilities, amenities, and services in their area. Overall, respondents reported a satisfactory level of satisfaction with these facilities. However, the study also reveals that further development is needed, as the overall satisfaction level is only 58 percent. Table 8 illustrates the respondents' satisfaction with the efficiency of the basic amenities and services provided to them.

4.5 Income

Figure 1 illustrates the income distribution among the respondents. Seventy percent of the respondents have an income of less than RM2,000, with 27 percent earning less than RM1,000. Only 4 percent of respondents have an income exceeding RM5,000. Regarding the overall income status, most respondents fall into the B40 category, with an average income below RM4,395 per month. Specifically, the household income in the study area is classified under the B40 (B1) income bracket, with more than half of the families earning less than RM2,500 per month.

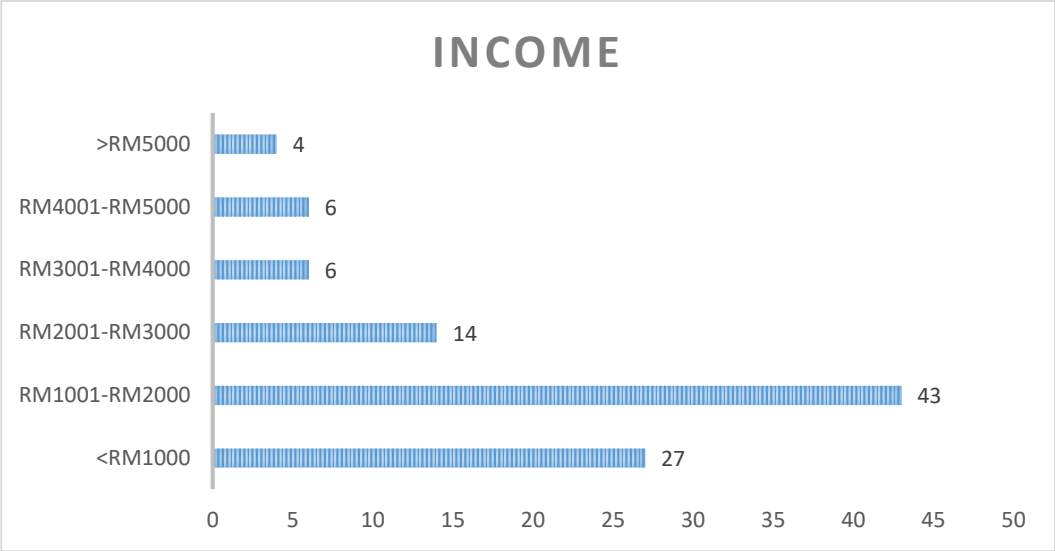

Figure 1: Respondents' Income in Study Area
(Source: Field survey, September 2023)

4.6 Awareness, Perception and Acceptability of Proposed Development

Several questions regarding awareness and perceptions of the proposed project in the area were included in the questionnaire survey. The majority of respondents were aware of the availability of various utilities, amenities, and services in the vicinity of the proposed project.

4.6.1 Awareness

Table 9 shows respondents' awareness and knowledge regarding the proposed project. A range of questions was posed to assess their awareness, as the perceived impacts of the project on the general well-being of the respondents and their community are crucial to this study. Concerning their knowledge of the proposed project, 99.0% of the residents were unaware of it, and 1.0% were unsure.

Table 9: Awareness and Knowledge

Awareness and knowledge	Percent
Awareness:	
Did not know	99.0
Not sure	1.0

(Source: Field survey, September 2023)

4.6.2 Perception of Impact on Socio-Economic

Table 9 displays the awareness and knowledge of respondents regarding the proposed project. A variety of questions were posed to gauge their awareness, given that the perceived impacts of the project on the general well-being of the respondents and their community are central to this study. Regarding their knowledge of the proposed project, 99.0% of residents were unaware of it, while 1.0% were unsure.

Table 10**:** Perception on socio-economic impact

Perception	Yes	No	Not sure	Total
Advantages				
Employment opportunities to your household members	37.0	46.0	17.0	100
Employment opportunities to local population	56.0	27.0	17.0	100
Improvement of basic amenities	40.0	42.0	18.0	100
Increased value of land / property	31.0	52.0	17.0	100

Increased standard of living	31.0	52.0	17.0	100
Increased job opportunities	40.0	44.0	16.0	100
Opportunity in asset ownership	28	54.0	18.0	100
Increase workers migration to the area	48.0	32.0	20.0	100
Disadvantages				
Loss of employment	1.0	**74.0**	25.0	100
Loss of source of income	1.0	**74.0**	25.0	100
Displaced	1.0	**74.0**	25.0	100
Loss of property	2.0	**74.0**	24.0	100
Marginalization of existing population	3.0	**74.0**	23.0	100

(Source: Field survey, September 2023)

4.6.3 Perception of Impact on Health and Safety

The perception of impacts on health and safety reveals that most indicators do not affect the respondents (see Table 5.10). The highest percentages of concern are related to potential impacts from air/dust pollution (54.0%) and increased congestion (43.0%), followed by increased noise pollution (29.0%). Overall, the percentage of respondents rating these criteria negatively is approximately moderate (Table 11).

Table 11**:** Perception of impacts on health and safety

Perception of impact on health and safety	**Percentage (%)**			
	Yes	**No**	**Not sure**	**Total**
Increased accident	25.0	63.0	12.0	100
Increased noise pollution	29.0	60.0	11.0	100
Increased congestion	43.0	47.0	10.0	100
Increased air/dust pollution	**54.0**	35.0	11.0	100
Increased odour pollution	28.0	60.0	12.0	100
Dangerous to the population	24.0	63.0	13.0	100
Disturb peace/tranquillity	16.0	71.0	13.0	100
Increased communicable diseases	23.0	64.0	13.08	100

(Source: Field survey, September 2023)

4.6.4 Perception of Impacts on Aesthetics and Culture

Table 12 presents an analysis of perceptions regarding the impacts on aesthetics and culture. The table indicates that some respondents were reasonably certain about the project's effects on the area's aesthetics and culture. Findings show that a high percentage (more than half) believe the proposed project would affect the air quality of the area (52.0%). Additionally, more than two-thirds of respondents felt that the project would not impact aspects such as the landform of the area (71.0%), important buildings (72.0%), and community traditions (72.0%).

Table 12**:** Rating of Perception of Impacts on Aesthetics and Culture

Perception of impact an Aesthetics and Culture	**Percentage (%)**			
	Yes	**No**	**Not sure**	**Total**
Affect landform of the area	10.0	**71.0**	19.0	100
Affect beauty of landscape	11.0	69.0	20.0	100
Affect air quality	**52.0**	32.0	16.0	100
Affect water quality	18.0	65.0	17.0	100
Affect tranquillity of the area	21.0	62.0	17.0	100
Affect community integration	10.0	70.0	20.0	100
Affect tradition on community	9.0	**72.0**	19.0	100
Affect important buildings	8.0	**72.0**	20.0	100

(Source: Field survey, September. 2023)

4.6.5 Perception of Impact on Basic Utilities and Amenities

The impact on amenities and facilities is another indicator of the physical changes that can be anticipated from any proposed project. In this study, the overall impacts of increased demand on basic utilities and amenities ranged from 26.0% (increased demand for policing services) to 27.0% (increased demand for garbage disposal) for all listed perceptions. This result is not surprising, as most residents were aware that the proposed project in the study area would not increase the demand for existing utilities and amenities. Table 13 illustrates respondents' perceptions of the proposed project's impact on basic utilities and amenities.

Table 13**:** Perception of impacts on basic utilities and amenities

Perception	Percentage (%)			
	Yes	No	Not sure	Total
Increased demand in housing	26.0	56.0	18.0	100
Increased demand in garbage disposal	27.0	56.0	17.0	100
Increased demand in public cleansing	26.0	56.0	18.0	100
Increased demand in bus, taxi, grab services	27.0	55.0	18.0	100
Increased demand in health services	27.0	54.0	19.0	100
Increased demand in police services	26.0	55.0	19.0	100
Increased demand in fire-fighting services	26.0	55.0	19.0	100

(Source: Field survey, September. 2023)

4.6.6 Assessment of level of Acceptability

Overall, the analysis of respondents' perceptions of the proposed project indicated that 51.0% of the respondents believed the project would have more positive impacts. Regarding the level of acceptance of the proposed project, the survey analysis revealed a balanced view among respondents: 38.0% supported the project, 35.0% opposed it, and 27.0% did not respond or provided no answer (Table 14).

Table 14**:** Level of assessment and Acceptability of the proposed Project

Level of impact	Total
More Positive impacts	51.0
More Negative impacts	49.0
Total	**100.0**
Acceptability of project	**Total**
Agree	38.0
Disagree	35.0
Not response / no answer	27.0
Total	**100**

(Source: Field survey, September. 2023)

4.7 Impact and Mitigation Measures

4.7.1 Impacts on Air Quality and Dust Pollution

The proposed project may adversely affect air quality due to the emission of hazardous dust, gases, and odors. These emissions could contain particulate matter and volatile organic compounds that contribute to air pollution, potentially leading to respiratory problems and other health issues for nearby residents. Given the project's proximity to residential areas, there is concern that it could exacerbate dust-related problems. Additionally, there have been previous incidents where hazardous chemicals from nearby sources damaged the roofs of buildings and houses. Although these issues have been resolved, residents remain concerned about the possibility of similar problems occurring in the future.

4.7.2 Impacts on Traffic Circulation (Congestion), Accident, and Safety

The transportation of raw materials for the proposed project may lead to an increase in heavy vehicle traffic

in the area. This surge in traffic could result in congestion on local roads, creating transportation challenges for both residents and businesses in the vicinity. Furthermore, the influx of heavy vehicles raises the risk of accidents, particularly if the roads are not adequately maintained or designed to accommodate the increased traffic. Such accidents could endanger the local population's safety and result in property damage and personal injuries.

4.7.3 Mitigating Measures

i. Air Quality and Dust Emission

a. Emission Control Technology: Implement advanced emission control technologies to reduce the release of hazardous dust and gases into the air. This includes utilizing pollution control equipment and filters.
b. Regular Maintenance: Ensure regular maintenance of machinery and equipment to minimize emissions and noise levels. Properly maintained equipment operates more efficiently and produces fewer pollutants.
c. Air Quality Monitoring System: Use an Air Quality Monitoring System to track air quality. This system will enable the project owner to prepare effective measures to address any issues that arise.

ii. Traffic Circulation (Congestion), Accident, and Safety

a. **Road Infrastructure Improvement:** Collaborate with local authorities to enhance road infrastructure, particularly on routes frequently used by heavy vehicles, to reduce congestion and improve safety.
b. **Traffic Management:** Implement traffic management plans that include designated routes for heavy vehicles and establish traffic flow guidelines to minimize congestion and reduce the risk of accidents.
c. **Driver Training and Safety Measures:** Provide training for heavy vehicle drivers to ensure safe and responsible driving practices. Implement safety measures such as speed limits and regular vehicle inspections.
d. **Collaboration with Local Communities:** Engage with local communities to raise awareness about the importance of safety and the risks associated with the proposed project area.

As for the relevant Malaysian guidelines or standards to contextualize proposed mitigation measures. For Malaysian context, among the policy or guidelines involved are such as Environmental Quality Act 1974 (EQA 1974), Environmental Impact Assessment 9EIA) Guidelines 2016, Environmental Quality (Clean Air) Regulations 2014, Environmental Quality (Industrial Effluent) Regulations 2009.

5. CONCLUSION

In summary, over 50% of respondents believe that the proposed project will be beneficial to them, and half of the respondents also support its development. Regarding socio-economic impacts, most respondents agree that the project will offer more advantages than disadvantages, particularly in terms of employment and job opportunities, and it will help to enhance basic amenities. However, concerning health and safety, more than half of the respondent’s express concerns about potential issues such as air and dust pollution, air quality, and increased traffic congestion.

Moreover, the impact on basic utilities and amenities is not considered significant. Most residents are aware that the proposed project will not increase the demand for existing utilities and amenities. They are also informed about the availability levels of various utilities, amenities, and services in their area. Although the satisfaction level of most respondents is moderate regarding facilities and amenities, all essential services are available in the study area. The development of the project will primarily affect air quality, dust, noise, as well as traffic congestion, accidents, and road safety. By implementing appropriate mitigation measures, the adverse impacts on the environment, communities, and public health can be minimized, leading to a more sustainable and responsible approach in the industry.

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