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## **AGROPOLITAN PLANNING AS A STRATEGY FOR PROMOTING SUSTAINABLE LIVING AMONG RURAL POOR COMMUNITIES: EMPIRICAL EVIDENCE**

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### **Abstract**

Although Malaysia's poverty rate has decreased, there are still people who suffer from extreme poverty, especially in rural areas. The agropolitan project aims to eradicate extreme poverty and accelerate development in rural areas. The achievements of agropolitan projects are evaluated through the extent to which they help participants to get out of extreme poverty and are measured using Poverty Line Income (PLI). A study using the Sustainable Livelihood Framework (SLF) was conducted at the Gahai Agropolitan Project, Lipis, Pahang, and involved 45 participants. Research data was obtained through the distribution of questionnaires and analyzed using Statistical Package for the Social Sciences (SPSS) version 22 software and Microsoft Excel. Studies indicate that the Gahai Agropolitan Project can eradicate poverty and contribute to sustainable livelihoods. From the aspect of sustainable living, the study results show that the participants of the Gahai Agropolitan Project experience high vulnerability. Moreover, asset ownership analysis reveals that the Gahai Agropolitan Project participants have good asset ownership.

**Keywords:** Agropolitan; rural; sustainable livelihood; poverty

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## **INTRODUCTION**

The development of agropolitan projects in Malaysia aims to eradicate extreme poverty in rural areas (Amriah et al., 2011; Amir et al., 2014). It is an integrated program to eradicate poverty through increasing income and quality of life and accelerating rural development. The implementation of the agropolitan project indicates the government's meticulous efforts to eradicate extreme poverty and increase rural development. Although rural areas are often associated with backwardness, isolation, and abandonment, they have high economic potential (Ismail et al., 2018). This economic potential can be achieved through increased agricultural, tourism, and industrial activities. For the agropolitan project, the main activity is agriculture, which can contribute to the economic development of the participants. This economic activity is crucial in increasing income and helping participants escape poverty. Currently, there are 11 agropolitan programs implemented by the government under the supervision of the Ministry of Rural and Regional Development (KKLW) (Ismail et al., 2019).

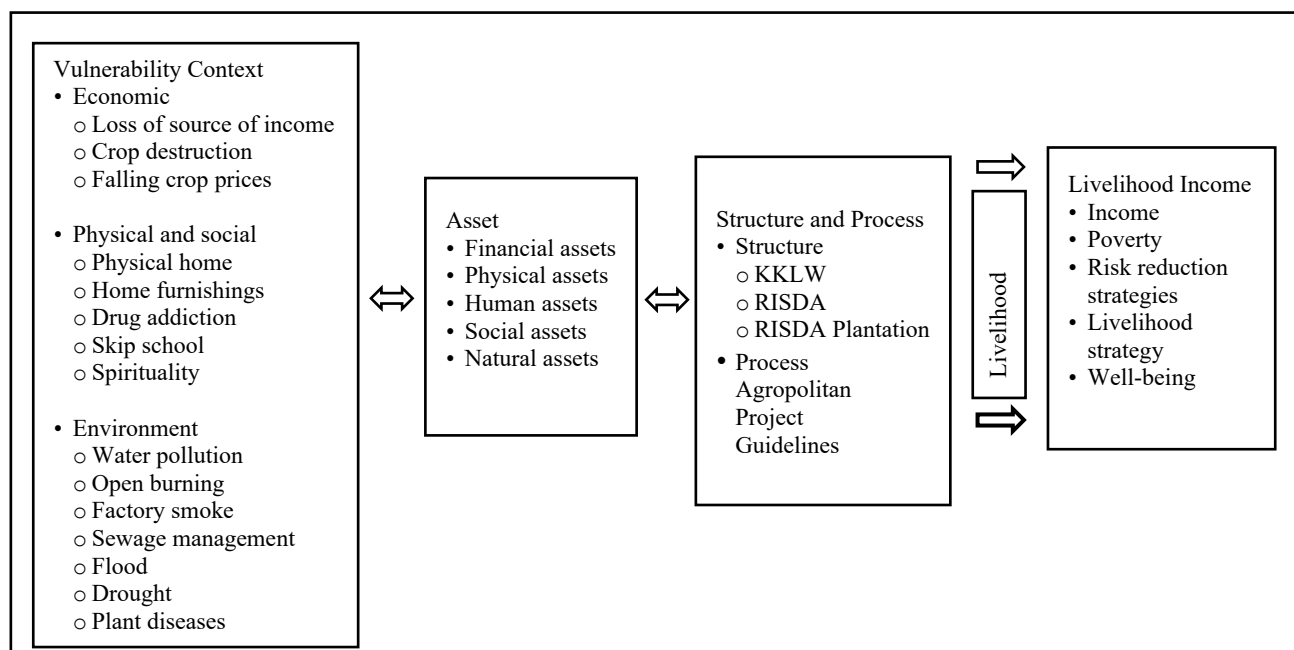
In addition, existing studies indicate no empirical study related to the impact of implementing agropolitan projects toward sustainable livelihoods in Malaysia. Recent studies such as Ahmad et al. (2019) focused more on the condition of the participants before and after participating in the Agropolitan program. Consequently, the absence of studies on the impact of the implementation of agropolitan projects results in no information capable of explaining the achievements of agropolitan projects in Malaysia. This type of study needs to be conducted to determine the project's achievement in achieving its development goals. For agropolitan projects, the impact of project implementation needs to be evaluated in the context of sustainable livelihoods. Therefore, based on empirical evidence, this study discusses agropolitan planning as a mechanism for sustainable living in poor rural communities.

## **CONCEPTUAL FRAMEWORK OF THE STUDY**

Figure 1 reveals the conceptual framework of the study modified based on the Department for International Development (DFID) (1999). The conceptual framework contains five main components: vulnerability context, assets, structures and processes, strategies, and livelihood outcomes. In the context of vulnerability, it involves three aspects, namely economic, social and physical, and environmental. Economic threats include the loss of sources of income or employment, the destruction of crop yields, and the fall in crop prices. Meanwhile, social and physical threats involve the physical condition of the home, lack of home furnishings, lack of basic facilities, relationship network problems, drug addiction problems, school truancy problems, and spirituality. At the same time, environmental threats include water pollution, open burning, the

release of factory fumes, foul odours from septic tanks, floods, droughts, harvests, and plant disease attacks.

Institutional elements refer to institutions that ensure the implementation of legislation and policies and provide services, exchanges, and certain functions that affect individuals or households. These institutions determine and influence the way individuals or households interact. This institutional context affects the vulnerability faced by individuals and access to life assets. This study has identified several institutions that are closely related to the study respondents, namely the KKLW, the Economic Planning Unit (UPE), the Rubber Industry Smallholder Development Authority (RISDA), the state government, and RISDA Plantation Sdn. Bhd and other agencies related to rural communities are either involved in providing assistance or services to rural communities and the poor.



Source: Modified from DFID (1999)

**Figure 1.** Conceptual Framework of the Study: Sustainable Livelihood Framework of the Gahai Agropolitan Project

In this study, livelihood strategy refers to the economic activities conducted by individuals, whether they are a main job or a side job. Livelihood income is an aspect that affects household well-being and long-term growth prospects. This study considers three criteria as elements of livelihood outcomes, namely income, well-being, and the reduction of vulnerability faced by individuals referring to the strategy of vulnerability reduction.

## **RESEARCH METHODOLOGY**

For this study, the research design combines qualitative and quantitative design. There is a difference between qualitative and quantitative methods. Qualitative methods tend to use deep analysis techniques (in-depth analysis), that is, using case studies to study problems. In this study, the study population is the participants of the Gahai Agropolitan Project, Lipis. Based on statistics from the Ministry of Rural & Regional Affairs, 80 Heads of Households are participating in the Gahai Agropolitan Project, Lipis. Based on the number, a total of 50 participants with settlements and 30 participants without settlements. Only settled Gahai Agropolitan Project participants are defined as the study population. This study used simple random sampling, which is justified because the study has a clear population definition and information. After identifying the sampling technique, the next study determines the sample size required for the study. In this study, the total number of samples (n) was determined based on the 90% confidence limit and 10% error, and it was based on the Yamane (1964) formula. Since the number for the population group is the same, which is 50, the calculation is demonstrated using 45 samples only. Regarding the type of question, two categories of questions, open questions and closed questions, were used in the questionnaire for this study. In addition, a five-point Likert scale was also used for perception questions. This study uses several types of software to analyze the data obtained, namely Statistical Package for the Social Sciences (SPSS) Version 22.

### ***Vulnerability Index***

The Vulnerability Index of this study is a composite index approach proposed by Hahn et al. (2009). The Vulnerability Index for the study involves three types of vulnerability, namely economic, social and physical, and environmental. The questions for each indicator are in the form of a dichotomy, which is 1 (facing/ever facing) and 0 (not facing). The selection of this indicator for the types of vulnerability is based on the Sustainable Livelihood Framework (SLF) DFID (1999), which has been adapted according to the context of this study. All vulnerability indicators are standardized (composite) and used to calculate this index. The Vulnerability Index calculation uses the same weighting value for

each type of vulnerability and the indicator that represents it. This same weighting consideration is based on Sullivan et al. (2002), where each indicator contributes equally to each type of vulnerability. Based on Hahn et al. (2009), index calculation should use a method that is easy to understand, and placing the same weights is one of the recommended methods. However, the researcher can change it according to the needs of the study. This study uses nominal data, which is 1 (facing/ever facing) and 0 (not facing). The nominal data for each indicator will be calculated in the form of a percentage and converted into an index value using the 92 conversion method found in the Human Development Index, which takes into account three main values, namely the actual data value, the minimum value and the maximum value (Hahn et al., 2009).

#### ***Asset Ownership Index***

The Asset Ownership Index of this study is a composite index approach proposed by Hahn et al. (2009). The Asset Ownership Index for this study contains five types of assets, namely financial assets, physical assets, human assets, social assets, and natural assets. These five assets are represented by 20 indicators. The selection of these indicators for these assets is based on the SLF DFID (1999), which has been adapted according to the context of this study. For the calculation of this index, only asset indicators that can be standardized (composited) are considered and used to calculate the asset ownership index. Asset indicators that cannot be standardized for calculation will be discussed descriptively only. The calculation of the Asset Ownership Index uses the same weighting value for each asset and the indicator that represents it. This same weighting consideration is based on Sullivan et al. (2002), where each indicator contributes equally to each type of asset. Based on Hahn et al. (2009), the use of calculating the Asset Ownership Index requires a method that is easy to understand, and placing the same weights is among the recommended methods. However, the researcher can change it according to the needs of the study.

Since each asset indicator has a different measurement scale, researchers can decide whether to use the original scale or select items that have a uniform measurement. This study considers only uniform asset indicators when forming the asset ownership index. This study uses nominal data, which is 1 (have) and 0 (does not have). The nominal data for each indicator will be calculated in the form of a percentage and converted into an index value using the conversion method found in the Human Development Index, which measures three main values, namely the actual data value, the minimum value, and the maximum value (Hahn et al., 2009).

### ***The calculation of the index***

The calculation of an index involves a systematic process to ensure a precise and standardized assessment. The initial step is to identify the indicators or constructs to be included in the index, such as land, housing, vehicles, livestock, savings, and other relevant factors. Since these indicators often have varying units of measurement, it is essential to normalize them to a common scale for comparability. Normalization adjusts the values of each indicator to a uniform range, typically between 0 and 1, ensuring consistency and alignment across all components.

Following normalization, equal weights are allocated to each asset and its associated indicators. This method, inspired by the work of Sullivan et al. (2022), ensures that every asset and indicator contribute equally to the overall index. For instance, if there are several assets, each is assigned an identical weight. Likewise, the indicators within each asset are weighted uniformly, promoting balance and fairness in their contribution to the composite index. The normalized values for each indicator are then aggregated to compute an overall score for each indicator, representing the average level of ownership or access associated with it.

After determining the scores for all indicators, the overall index is computed by combining the scores of all assets according to their assigned weights. While equal weighting is a common approach for simplicity, researchers can adjust the weights to reflect the relative significance of specific assets within the context of their study. The resulting index provides a single composite value, typically ranging from 0 to 1, where higher values indicate greater levels of asset ownership. This method, as advocated by Hahn et al. (2009), is both straightforward and flexible, enabling researchers to adapt the calculation process to meet their specific research goals and requirements.

## **EMPIRICAL ANALYSIS OF SUSTAINABLE LIVELIHOODS OF AGROPOLITAN PROJECT PARTICIPANTS**

Table 1 tabulates the Vulnerability Index for participants of the Gahai Agropolitan Project. According to Table 1, the highest threat vulnerability is Economic Threat, with a value of 0.689. Social and Physical Threats, as well as Environmental Threats, also occur, but their index values are small, namely 0.187 and 0.352, respectively.

Table 2 illustrates the Asset Ownership Index for participants of the Gahai Agropolitan Project. Based on the analysis of participants' asset ownership, it is high for human assets, social assets, financial assets, natural assets, and physical assets. This indicates that the asset ownership among participants of the Gahai Agropolitan Project is at a commendable level.

**Table 1:** Vulnerability Index of Participants in the Gahai Agropolitan Project

Construct	The value of the index according to the indicator	Type of Vulnerability	The value of the index is according to the type of vulnerability
Loss of the main source of income/job	0.600	Economic	0.689
Destruction of crops (rubber, vegetables, livestock, etc.)	0.533		
Fall in crop/commodity prices (rubber etc.)	0.933		
Physical condition of the house (cramped/bad house)	0.2	Social and Physical	0.187
Lack of home furnishings	0.133		
Lack of basic facilities (prayer, kindergarten, shop lot)	0.044		
Communication network problems (tarred roads, etc.)	0.022		
Drug addiction problem	0.111		
The problem of skipping school	0.778		
Spirituality	0.022		
There is a polluted river/source of water	0.089	Environment	0.352
There is open burning from agricultural activities	0.089		
Floods that damage crops and property	0.044		
Drought affecting agricultural production	0.933		
Storms that damage crops and property	0.289		
Plant disease attack (e.g., rubber tree disease, etc.)	0.667		

Source: Field Study (2022)

**Table 2:** Asset Ownership Index of Gahai Agropolitan Project Participants

Asset component	Index value according to indicator	Asset type	The value of the index depends on the type of asset
Respondent's highest education	1	Human assets	0.606
Current work experience	0.267		
Health	0.778		
Knowledge gets help	0.378		
Water source	1	Physical assets	1
Toilet	1		
Home conditions	1		
Home ownership	1		

Asset component	Index value according to indicator	Asset type	The value of the index depends on the type of asset
Vehicle ownership	1		
Association position	0.289		
PIBG	0.911	Social assets	0.75
Society	0.800		
Cooperative	1		
Land ownership	0.244		
Agricultural input assistance	0.244	Natural assets	0.466
Fertility	0.911		
Income (PGK)	0.966		
Acceptance of financial aid	1	Financial assets	0.630
Loan	0.244		
Savings	0.311		
Overall			0.690

*Source: Field Study (2022)*

### ***Sustainable Livelihood Results***

#### ***Increased Income***

Table 3 displays the income of participants in the Gahai Agropolitan Project, indicating an increase in 2022 compared to 2018. This demonstrates an improvement in the income of participants in the Gahai Agropolitan Project and signifies a positive outcome in achieving sustainable livelihoods as a result of their participation in the project.

**Table 3:** Income of Gahai Agropolitan Project Participants in 2018 and 2022

Year	2018	2022	
	n = 45		
Income	Percentage (%)	Income	Percentage (%)
RM500 and below	11.1	RM500 and below	0.0
RM501-RM1000	64.4	RM501-RM1000	8.9
RM1001 – RM1500	17.8	RM1001 – RM1500	31.1
RM1501 – RM2000	4.4	RM1501 – RM2000	42.2
RM2000 and above	2.2	RM2000 and above	17.8

*Source: Field Study (2022)*



### *Poverty reduction*

The poverty analysis of the Gahai Agropolitan Project participants uses the Poverty Line Income (PLI). The results reveal that a total of 43 respondents, or 96.6%, are not poor. It indicates that 43 of these respondents earn a monthly income of more than RM940. A total of two respondents, or 4.4%, are poor since they earn less than RM940 per month. In addition, 4.4% of these respondents did not earn enough income to meet basic needs, such as food and clothing, amongst others, to continue their lives. According to Ravallion (1995), individuals who earn a low income from PLI have constraints in obtaining a comfortable life since they face problems in meeting the needs of life.

### ***Vulnerability Reduction***

Vulnerability reduction analysis refers to the resilience strategies taken by the participants of the Gahai Agropolitan Project in the face of vulnerability. It refers to the resilience strategies taken by the study respondents for economic, social, physical, and environmental.

### *Economic vulnerability*

Table 4 provides the reduction strategy or resilience strategy against the economic vulnerability faced by the participants of the Gahai Agropolitan Project. Economic vulnerability refers to the loss of the main source of income or employment, the destruction of crops (rubber, vegetables, livestock, and others), and the fall in prices of crops or commodities (rubber and others). For losing the main source of income or job, the risk reduction strategy of doing a side job is the highest for both categories of respondents. Meanwhile, for the destruction of crops (rubber, vegetables, livestock, and others), resilience strategies are used more by the participants of the Gahai Agropolitan Project. A total of 22.2% of the participants of the Gahai Agropolitan Project implemented the strategy of planting or rearing and seeking help or compensation from related agencies.

In order to cope with the threat of a fall in the price of crops or commodities (rubber and others), as many as 68.9% of Gahai Agropolitan Project participants do side jobs.

**Table 4:** The reduction strategy or resilience strategy against economic vulnerability

Type of Vulnerability	Strategy for reducing vulnerability	Percentage (%) n = 45
Loss of primary income/source of employment	Seeking new employment	8.9
	Taking on side jobs	37.8
	Borrowing money	13.3
Destruction of crops (rubber, vegetables, livestock, etc.)	Replanting/rearing crops or livestock	22.2
	Seeking assistance/compensation from relevant agencies	22.2
	Taking out loans to restart enterprises	8.9
	Seeking new employment	8.9
Drop in crop/commodity prices (rubber, etc.)	Taking on side jobs	68.9
	Borrowing money	11.1
	Seeking assistance/compensation from relevant agencies	2.2
	Seeking new employment	8.9

*Source: Field Study (2022)*

*Vulnerability to social and physical threats*

Analysis of social and physical vulnerability reduction strategies involves resilience strategies in facing the vulnerability of the physical condition of the home, lack of home furnishings, lack of basic facilities, relationship network problems, drug addiction problems, school truancy problems and spirituality. In the face of the vulnerability of the physical condition of the house, many resilience strategies are implemented by the participants of the Gahai Agropolitan Project. Home renovation is a resilience strategy preferred by 13.3% of Gahai Agropolitan Project participants (Table 5). In order to overcome the lack of home furnishings, buying home furnishings by yourself is the strategy most used by participants of the Gahai Agropolitan Project.

**Table 5:** Comparison of social and physical vulnerability reduction strategies

Types of vulnerability	Vulnerability reduction strategies	Percentage (%) n = 45
Physical condition of the house (cramped/bad house)	Self-improvement of the house (continued)	13.3
	Repair the house yourself	4.4
	Apply for home help from the responsible party	2.2
Lack of home furnishings	Buy your own home furnishings	11.1
	Ask for help from the responsible party	2.2
Lack of basic facilities (prayer, kindergarten, shop lot)	Make reports and complaints to relevant agencies	4.4
	Ask for help from the responsible party	0
Communication network problems (tared roads and others)	Using the existing road (unpaved)	0
	Making reports and complaints from responsible parties	0
	Actions from responsible parties	2.2
Drug addiction problem	Advice to individuals involved	4.4
	Awareness program	0
	Actions from responsible parties	4.4
The problem of skipping school	Advice to individuals involved	20.0
	Awareness program	2.2
	Actions from responsible parties	55.6
Spirituality	Advice to individuals involved	8.89
	Organize spiritual programs	0
	Asking for help/action from the responsible party	0

Source: Field Study (2022)

Threats such as lack of basic facilities, relationship network problems, drug addiction problems, and spirituality are low threats faced by both categories of respondents. Therefore, the threat-friendly strategy only involves a small part of the respondents. However, for the ease of school truancy, it reveals three resilience strategies taken by the participants of the Gahai Agropolitan Project, which are advice to the individuals involved, the implementation of awareness programs, and actions from the responsible party.

#### *Ease of environmental threats*

The ease of environmental threats such as floods, droughts that affect agricultural yields, storms that damage crops and property, and plant disease attacks demonstrate a high number of resilience strategies for the participants of the Gahai Agropolitan Project. The analysis suggests that there are two resilience strategies for overcoming the threat of flooding that damages crops and property,

namely renovating houses and reclamation of higher land and getting help or compensation from related agencies (Table 6). A total of 4.4% of the participants of the Gahai Agropolitan Project renovated their houses and raised the land higher. In order to face the problem of drought affecting agricultural products, a total of 60% of respondents for the participants of the Gahai Agropolitan Project prioritize actions to do side jobs.

**Table 6:** The resilience strategies to ease environmental threats

Types of vulnerability	Vulnerability reduction strategies	Percentage (%) n = 45
There is a river or source of polluted water	Do not engage in polluting activities	6.7
	Implementation of awareness programs	0
	Actions from responsible parties	2.2
There is open burning from agricultural activities	Implementation of awareness programs	2.2
	Actions from responsible parties	4.4
Floods that damage crops and property	Renovating the house, raising the land higher	4.4
	Getting help/compensation from related agencies	0
	Build drainage/deepen ditches and drains	0
Drought affecting agricultural production	Do side jobs	60.0
	Borrow money	24.4
	Getting help/compensation from related agencies	6.7
Storms that damage crops and property	Repair damage	15.6
	Buy new equipment	2.2
	Getting help/compensation from related agencies	11.1
Plant disease attack (e.g., rubber tree disease and others)	Control of poisons and fertilizers	62.2
	Replant	0
	Getting help/compensation from related agencies	6.7

*Source: Field Study (2022)*

As for the vulnerability of storm damage to crops and property, the mitigation strategy only involves the participants of the Gahai Agropolitan Project through the strategy of repairing the damage, buying new equipment, and getting help or compensation from related agencies. Analysis of resilience strategies for plant disease attacks, such as rubber tree disease, indicates that a total of 62.2% of respondents from the participants of the Gahai Agropolitan Project opt for poison control measures. There are many responses to this vulnerability strategy since it is one of the main vulnerabilities faced by the respondent group.

### Well-being

Table 7 provides the analysis of the welfare of the participants of the Gahai Agropolitan Project for the economic, social, and physical dimensions, as well as the environment. This well-being analysis uses a Likert scale (value 1 to 5). Mean analysis reveals that the participants of the Gahai Agropolitan Project have high well-being in all dimensions.

**Table 7:** Well-being Analysis

Dimensions	Agropolitan Project Participants
Economic	4.203
Social and physical	3.902
Environment	3.839

Scale: 1 = Strongly disagree; 2 = Disagree; 3 = Medium; 4 = Agree; 5 = Strongly agree

Scale: \*Score: 1.00 – 2.39: Low; 2.40 – 3.79: Medium; 3.80 – 5.00: High

Source: Field Study (2022)

### SUMMARY

This study contributes to the study of existing literature related to agropolitan projects both in the country and abroad. Through the study of the impact of agropolitan projects in Malaysia, especially in the Gahai Agropolitan Project, this study can fill the research gap in studying the impact of agropolitan projects to eradicate poverty and contribute to the study of sustainable livelihoods in Malaysia. This study also contributed to the discovery of evidence of the impact of the Gahai Agropolitan Project on sustainable livelihoods. Furthermore, this study uses the Sustainable Livelihoods Framework, which discusses and links poverty, the role of agropolitans, and sustainable livelihoods.

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