

KEY FACTORS TO COMMUNITY-BASED MELIPONICULTURE SUSTAINABILITY WITHIN MALAYSIA'S ONE VILLAGE ONE PRODUCT (OVOP) FRAMEWORK

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ABSTRACT

Limited product branding, weak marketing capability, and management constraints have contributed to mixed outcomes in the implementation of Malaysia's One Village One Product (OVOP) strategy, particularly for community-based initiatives in rural areas. This study aims to identify strategies that can enhance the long-term sustainability and viability of community-based meliponiculture (stingless beekeeping) within the OVOP framework. The research focuses on Kampung Sedili Kecil, Johor, where meliponiculture has been developed as a local economic activity. A quantitative research approach was adopted, involving fifteen active participants through structured questionnaires, with data analysed using descriptive statistical techniques, including mean score analysis and ranking. The findings indicate that strong local leadership, consistent support from government agencies, and effective product branding are key drivers of program success, while limited access to financing, inadequate management skills, and insufficient infrastructure remain significant barriers. The study highlights the importance of capacity building, improved market access, and participatory governance as critical strategies to strengthen the sustainability of community-based meliponiculture, contributing to rural economic development and environmental stewardship in Malaysia.

Keywords: *Meliponiculture*, One Village One Product, community-based enterprise, local branding, rural livelihood.

1.0 INTRODUCTION

Rural development remains a central priority in Malaysia's national development agenda, particularly in addressing persistent challenges such as limited income opportunities, youth outmigration, low entrepreneurial participation, and the weak integration of rural products into competitive markets (Ministry of Rural Development Malaysia, 2019). Despite being rich in natural and cultural resources, rural areas continue to lag behind urban counterparts, widening socio-economic disparities and underscoring the need for localized, sustainable development models.

One such model is the One Village One Product (OVOP) concept, originally pioneered in Japan in the 1970s, which Malaysia has adapted to empower rural communities by promoting distinctive, value-added local products grounded in indigenous resources, creativity, and collective participation (Noradzman & Kamarudin, 2025; Kamarudin, 2018). OVOP is guided by three core principles: Local yet Global, Self-Reliance and Creativity, and Human Resource Development (Hoang Thanh et al., 2018; Igusa, 2008). In the Malaysian context, OVOP is

intended to foster rural entrepreneurship and reduce dependency on government-led initiatives (Igusa, 2015). However, its implementation has faced several challenges, including uncoordinated industrial clustering, inadequate infrastructure, and weak branding strategies for rural products (Kamarudin, 2018). Within this framework, meliponiculture or stingless beekeeping, has emerged as a promising community-based rural enterprise. The honey produced by *Trigona* species is valued for its nutritional, medicinal, and commercial properties, making it well-suited for OVOP branding. Moreover, meliponiculture is a low-cost and environmentally sustainable activity that complements agroecological livelihoods (Noradzman & Kamarudin, 2025).

This study examines the meliponiculture program in Kampung Sedili Kecil, Kota Tinggi District, Johor, implemented through a community cooperative. The initiative reflects a bottom-up development approach that emphasises local participation, use of local resources, and community ownership supported by relevant institutions (Syafaruddin & Haris, 2024). It provides opportunities for income generation and skills development among participants. However, several challenges limit its growth, including limited access to capital, inconsistent production capacity, lack of technical and management expertise, and weak digital marketing capabilities. In this regard, robust local leadership, reinforced by strong institutional synergy, alongside the emergence of significant branding potential, serves as a strategic catalyst for strengthening, scaling up, and ensuring the long-term sustainability of the initiative. Accordingly, This study aims to identify the key drivers and barriers influencing the sustainability of the stingless beekeeping community program and to propose strategic interventions to strengthen its long-term viability within the OVOP framework.

By providing empirical insights into the dynamics of rural innovation, OVOP implementation, and sustainable local entrepreneurship, this study offers practical implications for policymakers and practitioners seeking to enhance rural resilience through community-based initiatives.

2.0 LITERATURE REVIEW

This section reviews key literature relevant to rural development, beginning with the concept of One Village One Product (OVOP), followed by the community-based meliponiculture approach within the OVOP framework. It also examines the key implementation challenges and driving factors identified in previous studies, which form the basis for the study's assessment in the following the data analysis section.

2.1 One Village One Product (OVOP)

The One Village One Product (OVOP) movement was first introduced in Ōita Prefecture, Japan, in the 1970s by Governor Morihiko Hiramatsu as a strategy to stimulate local economic development through unique, value-added products derived from community resources (Noble, 2018). OVOP encourages communities to identify locally available resources, cultivate distinctive skills or products, and enhance marketability through innovation, quality improvement, and strategic branding (Schumann, 2016). By promoting self-reliance and leveraging local creativity, the OVOP approach seeks to strengthen rural economies while fostering cultural identity and sustainable livelihoods. Governor Hiramatsu outlined three fundamental principles of OVOP. (Hiramatsu, 1999; Igusa, 2008) describes these principles as follows: (1) Local but Global i.e. producing products that reflect local identity while meeting global market standards and requirements; (2) Self-Reliance and Creativity i.e. empowering local communities to become more self-reliant through the development of entrepreneurial capacity and creativity; and (3) Human Resource Development i.e. emphasizing human capital development through training, education, and exposure to modern technology and marketing techniques. A more detailed explanation of these core principles is presented in Table 1.

As explained in Table 1, the OVOP framework is built upon three interconnected principles. *Local but Global* promotes products that embody local culture and identity while meeting global market standards, utilizing local resources, craftsmanship, and storytelling to enhance value. On the other hands, *Self-reliance and Creativity* encourage communities to initiate and manage their own products, relying on local talent and resources with technical support from authorities, adopting a bottom-up development approach. Meanwhile, *Human Resource Development* focuses on nurturing proactive, skilled individuals capable of innovating and producing high-quality goods, fostering entrepreneurship, and identifying “local champions.” Together, these principles empower communities to achieve sustainable, competitive, and culturally rooted economic growth.

Table 1: Description of OVOP Principles

Local But Global	
Definitions	Scope and Characteristics
1. Globally accepted products that reflect of the local flavour and culture 2. OVOP movement has developed into enhancing local communities' entrepreneurial skills to utilize local resources and knowledge, creating value-adding activities through branding of local products in local economy 3. The first principle encourages rural entrepreneurs to produce at least one product of commercial value per village using available natural resources, local craftsmanship and creativity	● Reflect local flavour and cultural richness ● Uses of local human and material resources ● Utilities available natural resources, local craftsmanship and creativity ● Has a "story" behind the product
Self-reliance and creativity	
Definitions	Scope and Characteristics
1. The OVOP concept emphasizes the implementation of "One Village, One Product/Service" through self-initiated efforts by leveraging regional resources 2. The core principle is based on the role of grassroots communities as the driving force, with technical support from the administration and without direct financial assistance 3. Through the principles of self-reliance and creativity, communities are given the freedom to manage their own products. In addition, human resource development is also emphasized, as only skilled and committed individuals can produce high-quality products	● Initiated by local using potential resources of the region ● Local community as the driving force and administration from government is for indirect support, not financial but technical help ● Not government-led development initiative based on grant of public funds, but instead fuelled by the ideas and self-motivated efforts of community members itself ● Bottom-up approach toward the quantitative and qualitative development of the community
Human resource development	
Definitions	Scope and Characteristics
1. Fostering proactive people with a challenging and creative spirit (entrepreneurship) 2. Sustainable economic development depends on the skills and expertise of the community to drive innovation without relying on external assistance 3. Products must be of high quality and prioritize local labour	● Town leaders realising the importance of fostering human resources. ● Educating local to innovate and solve challenges on their own ● Quality of OVOP product or service should be improved by locals using local knowledge ● Electing "local champions"

Source: Adopted from Igusa (2008; 2015), Hoang Thanh et al. (2018), Kamarudin (2018), Schumann (2016)

2.2 OVOP Movement and the Rise of Meliponiculture in Malaysia

As explained in the previous section, the OVOP movement originated in the late 1970s in Ōita Prefecture, Japan. The approach encouraged communities to identify unique local resources, develop value-added products, and compete in broader markets while preserving cultural identity (Igusa, 2008). In December 1991, inspired by the success of this model, Malaysia's then Prime Minister, Tun Dr. Mahathir Mohamad, visited Ōita to learn from its experience. Following discussions with Governor Hiramatsu, he initiated Malaysia's first pilot OVOP project in his home state of Kedah in 1992, introducing the One District One Product (ODOP) program (Kamarudin, 2018). Over time, the concept evolved, first into the One Village One Industry (OVOI) approach and later formalized as the *Satu Daerah Satu Industri* (SDSI) program in 2003. The SDSI initiative emphasized the commercialization of products with strong local identity and market potential, such as traditional foods, handicrafts, herbs, and agro-based goods.

In Malaysia's current development framework, the philosophy is embedded within the National Rural Development Policy 2030 (NRDP), which prioritizes inclusive, sustainable, and community-led rural transformation. The NRDP supports OVOP through programs that promote local entrepreneurship, rural

innovation, and product commercialization, aiming to harness both local resources and human capital for economic growth (Kamarudin, 2018). However, despite policy support, the movement's success has been mixed, hindered by fragmented execution, overlapping agency mandates, insufficient evaluation mechanisms, limited innovation, and over-reliance on government assistance (Igusa, 2015). Strengthening institutional linkages, fostering creativity, and building self-reliance among rural entrepreneurs remain critical to realizing OVOP's full potential in Malaysia.

Meliponiculture, the practice of keeping and breeding stingless bees (meliponines), has gained significant traction in Malaysia in recent years, both as a rural enterprise and a contributor to ecological sustainability. The country's favorable tropical climate, rich biodiversity, and abundance of stingless bee species provide an ideal environment for their cultivation (Zohdi, 2024). Known locally as *kelulut*, these bees produce honey prized for its medicinal, nutritional, and commercial value, often commanding higher prices than conventional honey. Beyond honey, other products such as bee bread and propolis add to the enterprise's economic potential. In general, stingless bee honey has a higher moisture content (30-40%), water activity and free acidity than honeybee (Syamsudin et al., 2019). It has gained popularity not only as a functional food and dietary supplement but also for its beauty-enhancing and culinary uses. Meliponiculture requires relatively low capital investment, can be carried out near the home, and involves minimal maintenance. For many rural and Indigenous households, it provides a steady source of passive income, requiring little more than safe nesting environments and basic management practices, while supporting environmental conservation through enhanced pollination services (Nouala et al, 2018).

From a socioeconomic perspective, meliponiculture is scalable; one colony can yield multiple new colonies at minimal cost, requiring only new hives for expansion. However, studies reveal that many Malaysian beekeepers operate below optimal efficiency due to limited technical knowledge, resource mismanagement, and inadequate exposure to modern practices (Soh, Samsuddin, & Ismail, 2021). Factors such as beekeeper experience, education, regular agricultural officer visits, and access to pollen-rich flora directly influence productivity. Addressing these gaps through targeted training and government support could enhance profitability and long-term sustainability.

Community-based meliponiculture also holds promise as a platform for social entrepreneurship. Entrepreneurs managing operations at a commercial scale can produce premium-grade honey while diversifying into health products based on ongoing research and innovation. Furthermore, meliponiculture fosters community entrepreneurship by leveraging collective resources, strengthening local networks, and promoting shared economic goals. Community development theory underscores the role of solidarity, resource mobilization, and organized effort in achieving such outcomes (Bhattacharyya, 2004). In this sense, meliponiculture is not merely an economic activity; it is an avenue for community empowerment, cultural preservation, and environmental stewardship.

Review of literature was conducted to compile analyse the determinants affecting the scalability and long – term sustainability of community based meliponiculture system. (Rai,2025) . Enabling factors include effective local leadership, structured cooperatives, access to technical training, and support from agricultural institutions played crucial role in sustaining the activities and can significantly enhance the productivity and marketability of stingless bee products. Conversely, key barriers include limited access to start-up capital, lack of digital marketing literacy, weak branding, and fragmented value chains. Without addressing these systemic gaps, the broader integration of meliponiculture into Malaysia's OVOP framework may remain limited.

As shown in Table 2, the sustainability of meliponiculture within Malaysia's OVOP framework depends on a balanced integration of social, economic, and management factors across the three principles. Under the *Local but Global* dimension, success is driven by enhanced market access, strong social and business networks, and the acceptance of locally produced *kelulut* honey in digital marketplaces. The emphasis on technology adoption, cultural branding, and recognition in both domestic and foreign markets ensures competitiveness. Economically, empowering participants to determine their own strategies and maintaining product identity supports entrepreneurial autonomy. Management-wise, leveraging local resources, adhering to strict certification standards, and expanding market channels, supported by government initiatives, strengthens both credibility and reach.

Table 2: List of Assessment Factors for Meliponiculture within the OVOP Framework

Local But Global	
Dimension	Factors
Social	1. Level of access to wider domestic and international markets
	2. Extent of social and business networking among participants
	3. Availability of economic opportunities generated through the program
	4. Degree of acceptance of local products in digital and online markets
	5. Level of adoption of new technologies in production and marketing
	6. Extent to which products reflect local culture and identity
Economic	1. Level of awareness of external and foreign market requirements
	2. Degree of participant involvement in determining business strategies and directions
	3. Extent of opportunity for participants to market products under their own identity
	4. Level of entrepreneurial skills and knowledge related to OVOP product development
	5. Degree of recognition of local products in broader markets
Management	1. Extent of utilisation of local human and material resources
	2. Level of compliance with certification and quality standards
	3. Availability of market development and distribution channels
	4. Degree of efforts in cultivating local entrepreneurial talent
	5. Level of institutional and governmental support provided
Self-Reliance and Creativity	
Social	1. Clarity of business strategies and preparedness for future uncertainties
	2. Level of community participation and mutual support
	3. Degree to which local communities act as primary driving forces
	4. Level of exposure to innovation in product manufacturing
	5. Degree of openness to technology adoption in production processes
	6. Extent of preservation and continuation of inherited production skills
	7. Level of entrepreneurial independence among participants
Economic	1. Degree of product innovation within the community program
	2. Level of economic sustainability of meliponiculture activities
	3. Extent of utilisation of local natural and economic resources
	4. Level of income generated through the meliponiculture program
	5. Availability of employment opportunities created by the program
	6. Degree of change in household income among rural participants
Management	1. Extent to which a bottom-up approach is practiced in program management
	2. Level of utilisation of local human and material resources in management
	3. Availability of market development and distribution support mechanisms
	4. Degree of creativity and innovation in managing rural economic activities
	5. Availability of education and training programs for participants
	6. Level of incentives provided to small and medium enterprises within the community
Human Resource Development	
Social	1. Level of continuous learning and experimentation among participants
	2. Degree of access to business-related education and knowledge
	3. Extent of skill development through training and capacity-building programs
	4. Level of value addition achieved through technology use
	5. Degree of improvement in management, technical, and operational skills
	6. Level of collaboration and support among workshops or producer groups
Economic	1. Level of awareness of economic development opportunities through business activities
	2. Degree of improvement in local product quality and competitiveness
	3. Level of investment in production and processing technology
	4. Strength of linkages between rural and urban economic activities
	5. Level of growth in sales volume and production output
Management	1. Degree of attention given to participant welfare
	2. Level of leadership commitment within the community program
	3. Degree of recognition of the SME sector by government institutions

Sources: adopted from Igusa (2008; 2015), Hoang Thanh et al. (2018), Schumann (2016), Kamarudin (2018), Noradzman & Kamarudin (2025)

For *Self-Reliance and Creativity*, social factors such as community participation, innovative exposure, and the preservation of traditional skills foster resilience. Economically, product innovation, resource utilization, and income generation from honey production create sustainable livelihoods while opening new employment opportunities. Effective management in this context relies on a bottom-up approach, creative rural economic strategies, active training programs, and SME incentives to keep the community motivated and self-sustaining. In *Human Resource Development*, continuous learning, business education, and technology application enhance local skills and product value. Socially, knowledge sharing and workshop support systems build collective capacity. Economically, strengthening rural–urban linkages and investing in technology improves both production and sales. From a management perspective, leadership commitment, welfare prioritization, and governmental recognition of the SME sector ensure long-term institutional backing. Collectively, these factors demonstrate that meliponiculture sustainability in the OVOP framework is not solely dependent on honey production techniques, but on a holistic ecosystem of market integration, innovation, community participation, skills enhancement, and strategic governance.

The factors listed in the above table will serve as the basis for formulating the questionnaire for data collection and analysis, using a case study of a community-based meliponiculture project in Kota Tinggi District, Johor, which will be explained further in the subsequent section.

3.0 METHODOLOGY

3.1 Study Area and Research Approach

This study was conducted in Kampung Sedili Kecil, a rural coastal village located in the Kota Tinggi District, Johor, Malaysia (Figure 1). The study area was selected due to the active involvement of local residents in community-based meliponiculture, which serves both as a source of household income and as a small-scale commercial activity. The community's sustained engagement in stingless beekeeping provides a suitable context for examining factors influencing program sustainability within the One Village One Product (OVOP) framework. Kampung Sedili Kecil also offers favourable environmental conditions for meliponiculture, including a stable tropical climate, year-round flowering vegetation, and diverse natural resources such as mangrove forests, coastal flora, and surrounding agricultural areas that provide abundant nectar and resin sources. In addition, its socio-economic characteristics are broadly representative of many rural communities in Malaysia, making it an appropriate case study for investigating community-based rural enterprises under national development initiatives.

In terms of research design, this study adopted a quantitative research approach. Data were collected using a structured questionnaire administered to active participants involved in the meliponiculture program. The quantitative approach was selected to enable systematic measurement of respondents' perceptions regarding the level of influence of predefined assessment factors derived from the OVOP framework. This approach facilitates objective comparison, ranking, and identification of key driving and barrier factors affecting the sustainability of the initiative.

The study involved two main respondent groups: (1) managers or officers responsible for coordinating or supporting the community-based meliponiculture program, and (2) entrepreneurs or active participants directly engaged in stingless beekeeping activities. A total of 15 respondents participated in the study by completing the structured questionnaire, providing empirical input for the subsequent data analysis.

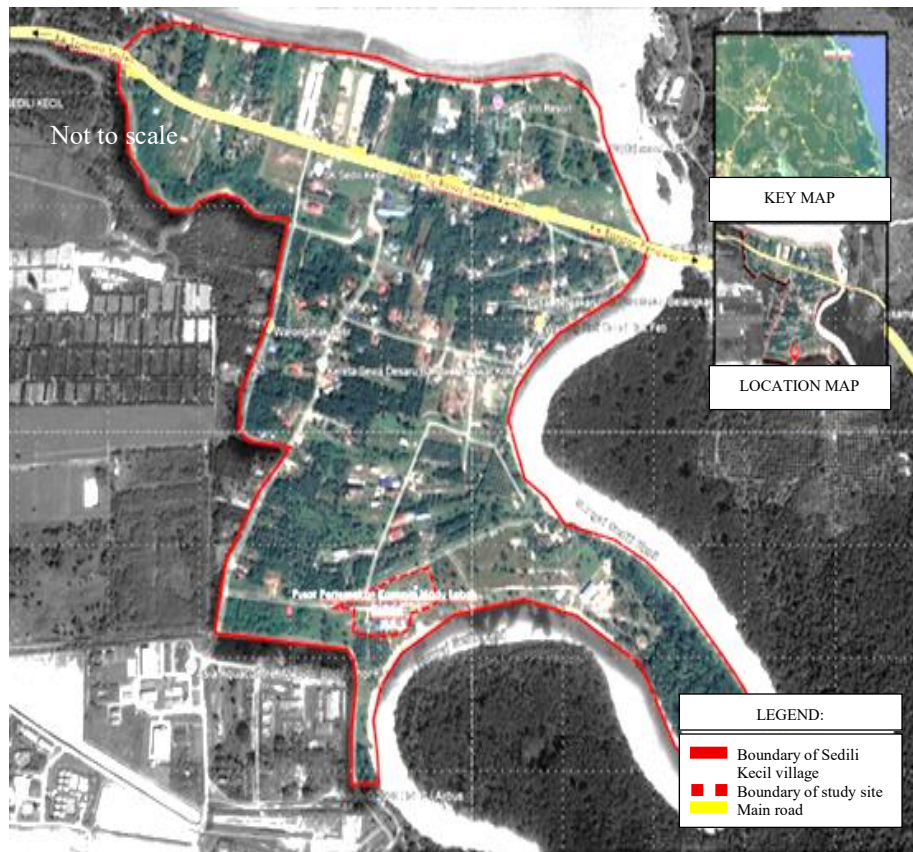


Fig. 1: Map of Kampung Sedili Kecil
(Source: Research Fieldwork in 2025)

3.2 Data Analysis

Descriptive analysis was employed to identify and rank the potential enabling and barrier factors of the community-based stingless beekeeping program in Kampung Sedili Kecil. This analysis utilised summary statistics such as minimum, maximum, average, median, mode, and standard deviation, with particular emphasis on minimum values and rankings. Quantitative data from the Likert scale were analysed to identify key patterns, ensuring that findings from interviews complemented the questionnaire results. This approach strengthened the conclusions, supported informed decision-making, and provided a deeper understanding of the phenomena under study. A four-point Likert scale was used to assess the perceived effectiveness of the community-based meliponiculture program in supporting the economic sustainability of rural residents. The scale ranged from 1 to 4, with Low Influence (1.00–1.50), Moderate Influence (1.51–2.50), High Influence (2.51–3.50), Very High Influence (3.51–4.00) (Table 3).

Table 3: Interpretation of mean score values

Meann score range	Interpretation
1.00-1.50	Low Influence
1.51-2.50	Moderate Influence
2.51-3.50	High Influence
3.51-4.00	Very high Influence

(Source: Riduwan,2012)

3.3 Profile of Respondents

As presented in Table 4, the study involved 15 respondents from Kampung Sedili Kecil, consisting of 60% male and 40% female. Most respondents (80%) were aged between 41 and 66 years, indicating a predominance of middle-aged and experienced individuals. This age group often possesses the physical capability, patience, and long-term commitment required for meliponiculture activities. All respondents were Malay, reflecting the ethnic

homogeneity of the village. The majority (86.7%) were married, while 13.3% were single parents, suggesting a stable family structure that supports community-based livelihoods.

Table 4: Interpretation of Min Score

Profile	Categories	Frequency	Percentage (%)
Gender	Male	9	60.0
	Female	6	40.0
Age	17-40	1	6.7
	41-55	6	40.0
	55-66	6	40.0
	>66	2	13.3
Race	Malay	15	100.0
Marital Status	Single	0	0.0
	Marriage	13	86.7
	Single Mother/Father	2	13.3
Respondent's Employment Status	Full time participant	15	100.0
Participation in the beekeeping community	Main source of income	10	66.7
	Source of part-time income	5	33.3

(Source: Research Fieldwork in 2025)

All respondents (100%) were full-time participants in the community-based meliponiculture program, highlighting the community's strong dedication to the activity. For 66.7% of them, beekeeping was their main source of income, while 33.3% considered it a supplementary income. This level of commitment reinforces Kampung Sedili Kecil's suitability as the study site.

4.0 RESULTS AND DISCUSSIONS

This section presents findings from the survey, highlighting the key drivers and barriers influencing the community-based meliponiculture program in Kampung Sedili Kecil. The results are discussed in relation to the study objectives and the OVOP framework, with implications for enhancing its long-term sustainability.

4.1 Key Driving Factors Influencing the Community-Based Meliponiculture Program

The results presented in Table 5 highlight the key driving factors that support the sustainability of the community-based meliponiculture program in Kampung Sedili Kecil. These driving factors are identified based on respondents perceived high to very high levels of influence, indicating conditions that actively enable program continuity, performance, and growth within the OVOP framework. Under the *Local but Global* dimension, the most influential driving factor is the extent of opportunity for participants to market products under their own identity (mean = 3.80), which ranks highest among all factors. This finding underscores the importance of ownership, branding autonomy, and product identity in motivating community participation and enhancing market competitiveness.

The ability to sell products under a distinct local identity aligns strongly with the OVOP principle of leveraging local uniqueness for broader market engagement. Closely related drivers include the availability of economic opportunities generated through the program and institutional and governmental support (both mean = 3.67), indicating that tangible income prospects and consistent external support play a critical role in sustaining community involvement. The degree of leadership commitment within the community program also records a very high level of influence (mean = 3.73), ranking second overall. This highlights the central role of strong local leadership in coordinating activities, maintaining collective motivation, and facilitating linkages with supporting agencies. Effective leadership functions as a catalyst that translates external support and market opportunities into actionable outcomes at the community level.

Within the *Self-Reliance and Creativity* dimension, several factors demonstrate high influence, reflecting the program's entrepreneurial foundation. The level of entrepreneurial independence among participants (mean = 3.40) and participant involvement in determining business strategies and directions (mean = 3.07) indicate an encouraging degree of autonomy and decision-making capacity among community members. These findings

suggest a gradual transition toward self-reliant entrepreneurship, which is essential for long-term sustainability beyond project-based assistance. Similarly, the level of openness to technology adoption and the degree of product innovation (mean values above 3.20) point to adaptive behaviours that support productivity improvement and responsiveness to market demands, even though these factors are not the strongest drivers.

The *Human Resource Development* dimension further reinforces the importance of capacity building in sustaining the initiative. High influence scores for continuous learning and experimentation (mean = 3.47) and availability of education and training programs (mean = 3.40) indicate that skill enhancement and knowledge development are integral to maintaining production quality and operational efficiency. These factors contribute to strengthening human capital, enabling participants to adopt better practices and respond to emerging challenges more effectively.

Table 5: Assessment of Driving Factors Influencing the Community-Based Meliponiculture Program in Kampung Sedili Kecil (n = 15)

Driving factors		Likert scale				Mean score	Level of influence	Rank
		1	2	3	4			
Local But Global								
1.	Level of access to wider domestic and international markets	0	0	10	5	3.33	Very High	6
2.	Degree of recognition of local products in broader markets	1	0	7	7	3.33	High	6
3.	Extent of social and business networking among participants	0	0	11	4	3.27	High	7
4.	Availability of economic opportunities generated through the program	0	0	5	10	3.67	Very High	3
5.	Extent of opportunity for participants to market products under their own identity	0	0	3	12	3.80	Very High	1
Self-Reliance & Creativity								
6.	Degree of participant involvement in determining business strategies and directions	0	1	12	2	3.07	High	8
7.	Level of openness to technology adoption in production processes	0	0	10	5	3.33	High	6
8.	Degree of product innovation within the community program	0	0	11	4	3.27	High	7
9.	Level of entrepreneurial independence among participants	0	1	7	7	3.40	High	5
Human Resource Development								
10.	Level of continuous learning and experimentation among participants	0	0	8	7	3.47	High	4
11.	Availability of education and training programs for participants	0	0	9	6	3.40	High	5
12.	Degree of leadership commitment within the community program	0	0	4	11	3.73	Very High	2
13.	Level of institutional and governmental support provided	0	0	5	10	3.67	Very High	3

(Source: Research Fieldwork in 2025)

Note/Interpretation: Low Influence (1.00–1.50), Moderate Influence (1.51–2.50), High Influence (2.51–3.50), Very High Influence (3.51–4.00)

Overall, the findings from Table 5 demonstrate that the sustainability of the Kampung Sedili Kecil meliponiculture program is primarily driven by a combination of branding autonomy, leadership strength, economic opportunity, institutional support, and ongoing capacity development. These drivers provide a strong foundation for the initiative and create favourable conditions for growth. However, their effectiveness is closely linked to the extent to which identified barriers, particularly those related to market readiness, innovation depth, and training accessibility, are addressed. Together, the driving factors identified in this analysis inform

the strategic recommendations proposed in the subsequent section to strengthen the program's long-term viability within the OVOP framework.

4.2 Key Barrier Factors Influencing the Community-Based Meliponiculture Program

The analysis presented in Table 6 highlights several factors that constrain the sustainability of the community-based meliponiculture program in Kampung Sedili Kecil. These barriers are identified based on respondents' perceptions of moderate to high levels of influence, indicating areas where limitations remain despite the presence of enabling conditions identified earlier. Under the *Local but Global* dimension, the most influential barriers relate to the level of awareness of external and foreign market requirements and compliance with certification and quality standards, both recording the highest average scores (mean = 2.53). These findings suggest that while participants are actively engaged in honey production, they face challenges in meeting market readiness requirements beyond the local context. Limited understanding of certification processes, packaging standards, and regulatory compliance may restrict access to wider domestic and international markets, thereby constraining the OVOP objective of scaling local products to broader market platforms. In addition, the moderate acceptance of local products in digital and online markets (mean = 2.27) and the limited availability of market development and distribution channels (mean = 2.47) indicate gaps in digital marketing capability and structured market linkages, which are increasingly critical for rural enterprises seeking competitiveness.

Table 6: Assessment of Barrier Factors Influencing the Community-Based Meliponiculture Program in Kampung Sedili Kecil (n = 15)

Rampung Sedih Recl (n = 15)

Barrier	Respondent Score				Average Score	Level Of Influence	Rank
	1	2	3	4			
Local But Global							
1. Level of awareness of external and foreign market requirements	6	1	2	6	2.53	High	1
2. Level of compliance with certification and quality standards	4	0	9	0	2.53	High	1
3. Degree of acceptance of local products in digital and online markets	1	9	5	0	2.27	Moderate	2
4. Availability of market development and distribution channels	1	7	6	0	2.47	Moderate	3
Self-Reliance & Creativity							
5. Level of openness to technology adoption in production processes	0	9	6	0	2.40	Moderate	4
6. Degree of entrepreneurial independence among participants	1	7	6	0	2.47	Moderate	3
7. Degree of product innovation within the community program	2	3	10	0	2.13	Moderate	7
8. Level of clarity of business strategies and preparedness for future uncertainties	2	6	6	1	2.40	Moderate	4
Human Resource Development							
9. Level of continuous learning and experimentation among participants	2	6	6	1	2.40	Moderate	5
10. Availability of education and training programs for participants	3	4	8	0	2.33	Moderate	4
11. Level of collaboration and support among workshops or producer groups	3	7	5	0	2.33	Moderate	5

Source: Research Fieldwork in 2025)

Note / Low Influence (1.00–1.50), Moderate Influence (1.51–2.50), High Influence (2.51–3.50), Very High Influence (3.51–4.00)

Within the *Self-Reliance and Creativity* dimension, several barriers reflect constraints in entrepreneurial capacity and innovation. The moderate level of openness to technology adoption in production processes (mean = 2.40) suggests that while basic technologies are in use, more advanced or efficiency-enhancing technologies have yet to be fully embraced. Similarly, the degree of entrepreneurial independence among participants (mean = 2.47) indicates continued reliance on

external guidance or institutional support, limiting autonomous decision-making and long-term self-reliance. The degree of product innovation recorded the lowest mean score (mean = 2.13), highlighting limited diversification beyond raw honey products. This lack of innovation may reduce the program's resilience to market competition and price fluctuations, particularly in an increasingly saturated honey market.

Barriers associated with *Human Resource Development* further reinforce the importance of sustained capacity building. The moderate levels of continuous learning and experimentation, availability of education and training programs, and collaboration among workshops or producer groups (mean scores ranging from 2.33 to 2.40) indicate that while training opportunities exist, their frequency, accessibility, or relevance may be insufficient to meet participants' evolving needs. Limited inter-group collaboration may also reduce opportunities for knowledge sharing, collective problem-solving, and coordinated scaling of production.

Overall, the findings from Table 6 demonstrate that the barriers faced by the Kampung Sedili Kecil meliponiculture program are not due to the absence of participation or institutional presence, but rather stem from capacity gaps in market readiness, innovation, technology adoption, and continuous skills development. These constraints highlight the need for targeted interventions that move beyond initial support toward strengthening entrepreneurial autonomy, market integration, and human capital development. Addressing these barriers is essential to ensure that the strong driving factors identified earlier are not undermined, and that the program can achieve sustained growth in alignment with the OVOP framework.

4.3 Discussion of Results

The findings from Tables 5 and 6 provide a consolidated understanding of the factors influencing the sustainability of the community-based meliponiculture program in Kampung Sedili Kecil within the OVOP framework. Taken together, the results indicate that the initiative is supported by a strong set of internal and external enabling conditions, while facing several capacity- and market-related constraints that moderate its long-term development potential. The analysis of driving factors (Table 5) highlights the central importance of branding autonomy, leadership commitment, economic opportunity, and institutional support in sustaining the program. The highest-ranked driver i.e. the extent of opportunity for participants to market products under their own identity, reflects the critical role of product ownership and local branding in motivating participation and strengthening market positioning. This finding strongly aligns with the OVOP principle of *Local but Global*, which emphasises leveraging local identity to access wider markets. Similarly, the high influence of leadership commitment and institutional and governmental support underscores the importance of effective local coordination and external facilitation in enabling bottom-up rural development. These factors function collectively to translate local resources and skills into viable economic activities.

Drivers associated with *Self-Reliance and Creativity* further indicate a positive trajectory toward entrepreneurial autonomy. High influence levels for entrepreneurial independence, participant involvement in business decision-making, and openness to technology adoption suggest that community members are not merely passive beneficiaries, but active agents shaping the direction of the initiative. This reflects a gradual shift from dependence on external support toward self-directed enterprise development, which is essential for sustaining OVOP initiatives beyond initial intervention phases. Meanwhile, drivers related to *Human Resource Development*, including continuous learning, training availability, and leadership capacity, reinforce the role of human capital in maintaining operational effectiveness and adaptive capacity.

Despite these strengths, the barrier analysis (Table 6) reveals several constraints that limit the program's ability to scale and compete more effectively. Barriers associated with the *Local but Global* dimension i.e. particularly limited awareness of external market requirements and compliance with certification and quality standards, indicate gaps in market readiness that restrict access to broader domestic and international markets. Moderate influence levels for digital market acceptance and availability of distribution channels further suggest that existing market linkages remain underdeveloped, constraining the commercial potential of locally branded products.

Within the *Self-Reliance and Creativity* dimension, moderate influence scores for product innovation, technology adoption, and clarity of business strategies point to limitations in entrepreneurial depth rather than a lack of participation. While basic production activities are well established, insufficient innovation and strategic planning may reduce resilience to market changes and limit value addition. Similarly, barriers related to *Human Resource Development*, including training accessibility, continuous learning, and inter-group collaboration,

suggest that existing capacity-building efforts may not yet be adequate in frequency, coordination, or relevance to support long-term enterprise growth.

Overall, the results indicate that the Kampung Sedili Kecil meliponiculture program possesses a strong enabling foundation, particularly in leadership, institutional support, and branding autonomy, but remains constrained by market readiness, innovation capacity, and structured skill development. The sustainability of the initiative therefore depends not on initiating new activities, but on strengthening and integrating existing drivers while systematically addressing the identified barriers. These insights provide a clear empirical basis for the strategic recommendations proposed in the following section, which are designed to enhance scalability and long-term viability in alignment with OVOP principles.

5.0 RECOMMENDATIONS AND CONCLUSION

Figure 2 presents a phased strategic framework to strengthen the sustainability of the community-based meliponiculture initiative in Kampung Sedili Kecil within the One Village One Product (OVOP) framework. The proposed strategies are structured across three interrelated development dimensions namely Social, Economic, and Management, and implemented over short-term, medium-term, and long-term phases. This sequencing reflects the need to progressively consolidate internal capacity, improve market readiness, and establish sustainable governance structures. In the short-term phase (within 3 months), the strategies prioritise strengthening the program’s social foundation through community participation, leadership development, and peer learning. These actions build on key driving factors identified in Table 5, particularly leadership commitment, institutional support, and continuous learning, while reinforcing collective branding and environmental stewardship that underpin the OVOP principle of Local but Global.

The medium-term phase (4–12 months) focuses on enhancing economic performance and market integration. The development of a unified “Sedili Kecil Kelulut Honey” brand, expansion of digital marketing and eco-tourism linkages, and encouragement of product diversification directly respond to market-related constraints identified in Table 6, including limited awareness of external market requirements, certification compliance, and acceptance in digital markets. These strategies aim to convert existing strengths in branding autonomy and economic opportunity (Table 5) into broader market competitiveness.

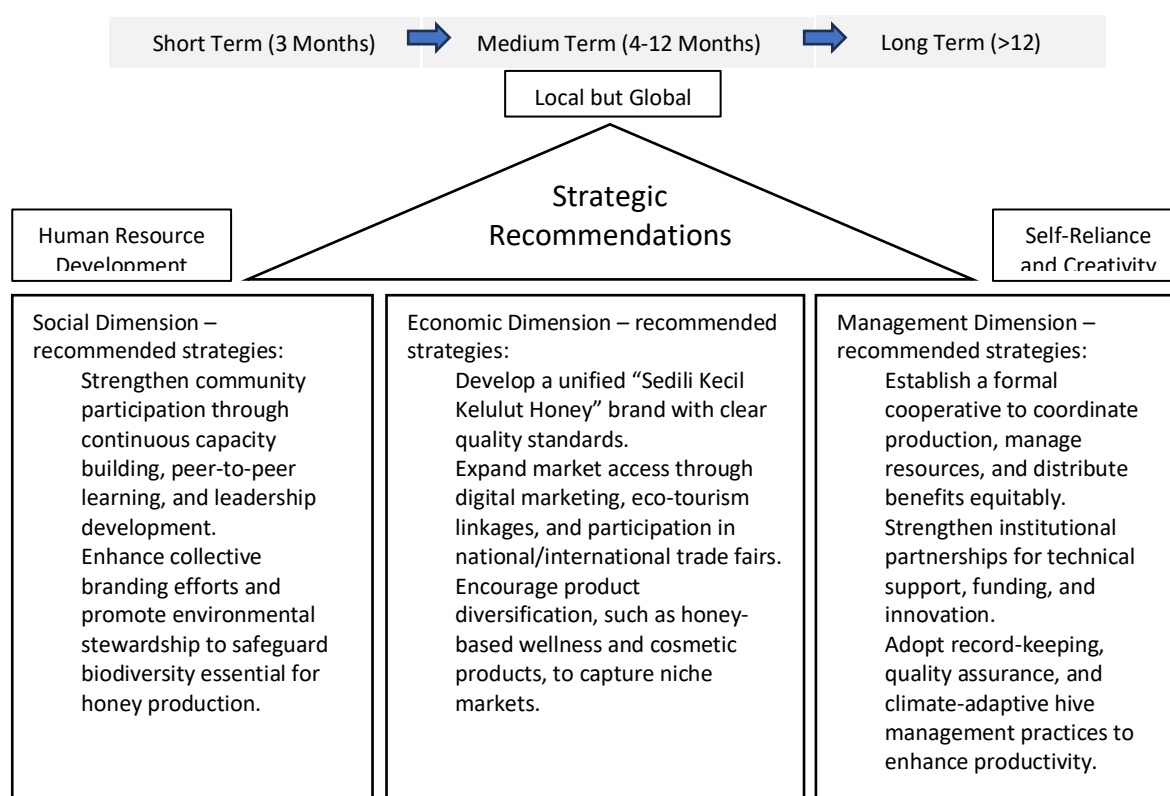


Fig. 2: Strategic recommendations for *meliponiculture* in Kampung Sedili Kecil within the OVOP framework

In the long-term phase (beyond 12 months), the emphasis shifts toward institutional consolidation and self-sustaining management. The establishment of a formal cooperative, strengthened institutional partnerships, and adoption of quality assurance and climate-adaptive management practices address barriers related to entrepreneurial independence, strategic clarity, and coordination (Table 6), while reinforcing long-term drivers such as institutional support and human resource development (Table 5).

In conclusion, this study examined the sustainability of a community-based meliponiculture initiative in Kampung Sedili Kecil within Malaysia's One Village One Product (OVOP) framework. The first research aim was successfully achieved by identifying key driving and barrier factors using descriptive statistical techniques, including mean score analysis and ranking. The findings indicate that strong local leadership, institutional support, product identity, and market access act as primary drivers, while moderate influence levels related to market readiness, certification compliance, technology adoption, and training availability function as key barriers to sustainability. The second research aim was also achieved through the development of phased strategic recommendations aligned with OVOP principles. These strategies address identified constraints by strengthening capacity building, branding, market integration, and governance mechanisms. Overall, the study demonstrates that community-based meliponiculture has strong potential as a sustainable OVOP enterprise when supported by targeted, context-specific interventions.

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REFERENCES

- Bhattacharyya, J. (2004). Theorizing community development. *Community Development*, 34(2), 5–34.
- Hiramatsu, M. (1999). *Speech of the One Village One Product movement spreading throughout the world*. JICA Symposium.
- Hoang Thanh, L., Ta Nhat, L., Nguyen Dang, H., Ho, T. M. H., & Lebailly, P. (2018). One Village One Product (OVOP)—A rural development strategy and the early adaptation in Vietnam: The case of Quang Ninh Province. *Sustainability*, 10(12), Article 4485.
- Igusa, K. (2008). *The problem of regional revitalization in Asia and One Village One Product: Adaptability of Oita model to Asian countries*.
- Igusa, K. (2015). *Globalization in Asia and local revitalization efforts: A view from the One Village One Product (OVOP) movement in Oita*.
- Kamarudin, K. H. (2018). *One Village One Product (OVOP) plan for B40: Toward inclusive and sustainable rural development*.
- Ministry of Rural Development. (2019). *Rural Development Policy 2030 (RDP 2030)*. Ministry of Rural Development.
- Noble, V. (2018). Mobilities of the one-product policy from Japan to Thailand: A critical policy study of OVOP and OTOP. *Territory, Politics, Governance*, 7(4), 455–473.
- Noradzman, N. M. H., & Kamarudin, K. H. (2025). Boosting rural sustainability through the One Village One Product initiative: A case study of the stingless beekeeping program in Sedili Kecil, Johor. Paper presented at the *2nd International Urban Planning Conference (iNUPC) 2025*, Universiti Teknologi Malaysia, Johor Bahru, Malaysia.
- Nouala, S., & Ossiya, S. A. (2018). *The future of the African bee: A call to mainstream beekeeping to enhance delivery of the Malabo Declaration*. African Union–Interafrican Bureau for Animal Resources.
- Rai, V. L., Singh, R. P., Patel, S., Singh, D. K., & Maheshwari, S. (2025). A review on the potential of stingless bee culture (meliponiculture) for sustainable agriculture and rural development. *Uttar Pradesh Journal of Zoology*, 46(17), 88–94. <https://doi.org/10.56557/upjoz/2025/v46i175212>
- Riduwan. (2012). *Skala pengukuran variabel-variabel penelitian*. Alfabeta.
- Schumann, F. R. (2016). A study of One Village One Product (OVOP) and workforce development: Lessons for engaging rural communities around the world. *Pacific Asia Inquiry*, 7(1), 89–105.
- Syamsudin, S., Selamat, J., Sanny, M., Abd. Razak, S.-B., Jambari, N. N., Mian, Z., & Khatib. (2019). Influence of origins and bee species on physicochemical, antioxidant properties and botanical discrimination of stingless bee honey. *International Journal of Food Properties*, 21(1), 239–264.

- Soh, N. C., Samsuddin, N. S., Ismail, M. M., & Habibullah, M. S. (2021). Technical efficiency of commercial stingless bee honey production in Peninsular Malaysia. *Pertanika Journal of Social Sciences & Humanities*, 29(2), 785–797.
- Syafaruddin, & Haris, A. (2024). Enhancing community participation in regional development planning through a bottom-up approach. *International Conference of Innovation Science, Technology, Education, Children and Health*. <https://doi.org/10.62951/icistech.v5i1.269>
- Zohdi, R. (2024). Malaysian stingless bee propolis: Unearthing a bioactive treasure trove. *Prescription*, (6).