Global Scientific and Academic Research Journal of Multidisciplinary Studies
ISSN: 2583-4088 (Online)
Frequency: Monthly
Published By GSAR Publishers
Journal Homepage Link- https://gsarpublishers.com/journals-gsarjebm-home/

AGRIBUSINESS STRATEGY OF TRIGONA HONEY BEE FARMING (Trigona sp.) TO STRENGTHEN LOCAL ECONOMY IN PEMPATAN VILLAGE, BALI, INDONESIA

BY

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Article History

Received: 03/10/2023
Accepted: 09/10/2023
Published: 11/10/2023

Vol – 2 Issue – 10

PP: - 05-10

Abstract

There is significant potential for expanding and advancing the Trigona sp. sp. honey bee farming business in Indonesia. This research aimed to 1) assess the potential of Pempatan Village in developing the Trigona sp. sp. honey bee farming business; 2) analyze the internal and external factors that influence the development of the Trigona sp. sp. honey bee farming business; 3) formulate a suitable concept for the implementation of a Trigona sp. sp. honey bee farming business in Pempatan Village; and 4) develop a business strategy for Trigona sp. sp. honey bee farming to improve the community's economy. Data was collected through interviews using structured questionnaires, in-depth interviews, observations, and a review of relevant literature and documents. The data was then analyzed using Internal-External, SWOT, and QSPM analysis. This study's findings suggest that eight alternative strategies can be employed in the Trigona sp. sp. honey bee farming industry. These strategies include 1) Enhancing product quality stability through the implementation of total quality management, 2) Diversifying honey types based on the type of feed used, 3) Enhancing breeder skills and adopting appropriate technology in the honey harvesting process, 4) Ensuring the availability of feed by cultivating bee feed source plants, 5) Utilizing packaging technology to guarantee product quality and attractiveness, 6) Incorporating digital marketing and e-commerce in honey marketing efforts, 7) Applying the Penta Helix concept in the development of the Trigona sp. honey bee farming industry.

Keywords: *Strategy, agribusiness, honey, SWOT, QSPM*

Introduction

Indonesia is renowned for its tropical environment, characterized by a rich diversity of flora and fauna. The vast expanse of forested regions and sunlit-rich soil throughout the year is a remarkable asset for Indonesia. High biodiversity should be an alternative to improving community welfare. However, society's paradigm in utilizing biodiversity, especially in the agricultural and livestock sectors, has not reached this awareness. People currently only comprehend the economic potential of forests as a source of timber production. However, there is still much non-timber potential that we can obtain from forests, such as resin, rattan, various flora and fauna, and honey (Harjanto et al., 2020).

Indonesia has a high diversity of bee species, both with and without stings or *Meliponini*. One type of Melipon bee is the *Trigona sp.* honey bee, which is known as the kele bee in the Balinese language. *Trigona sp.* bees are black and have a smaller body size than honey bees from the Genus Apis. Most types of bees can produce good-quality honey. Honey from *Trigona sp.* bees is in great demand by the public and has great potential to be developed economically. If the potential of the *Trigona sp. sp.* bee is properly managed, it can contribute positively to the local economy, particularly for those who reside near forest areas. In a document, FAO (Feed and Agriculture Organization) states that bee cultivation is a good economic opportunity for communities around forest areas (Hilmi et al., 2011).

In an effort to increase the growth of the honey bee farming business, it is necessary to adopt an endogenous approach that relies on initiative and objective regional conditions. Increasing integration between sectors must be carried out continuously, especially innovation, collaboration, and synergy. Honey bee cultivation has good integration with forest conservation efforts. Bees are known to be crucial to the regeneration of various types of plants by spreading pollen and naturally helping fertilization. The *Trigona sp.* honey bee is often cultivated in regions adjacent to protected forests in Pempatan Village, Rendang District, Karangasem Regency.

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Honey production is not optimal in quantity and quality because beekeeping is still conducted rudimentarily without effective management. Farmers run their businesses conventionally without a clear concept of the direction and goals of their business development. It has resulted in the slow growth of the honey bee farming business in Pempatan Village, while the demand for *Trigona sp.* honey is increasing. In order to enhance the expansion of the *Trigona sp.* honey bee farming business, it is important to investigate the conceptual framework of the *Trigona sp*. honey bee farming business development system. It is hoped that the results of this study can be used as a guide for breeders and policymakers for the development of honey bee farming businesses in the future.

This research aimed to analyze the potential of the Pempatan Village area in developing the *Trigona sp.* honey bee farming business, analyze the internal and external factors that influence the development of the *Trigona sp.* honey bee farming business, and develop a strategy for the *Trigona sp*. honey bee farming business to improve the local economy.

METHODOLOGY

Sampling

This survey research was conducted in Pempatan Village, Rendang District, Karangasem Regency, Bali - Indonesia. The types of data used were primary and secondary data. Primary data was obtained in two ways, namely: 1) In-depth interviews with respondents from breeders, academics, and government officials, and direct observation at the research site; 2) Focus Group Discussion (FGD) method with relevant agencies in the field of livestock business development in Pempatan Village, Rendang District, Karangasem Regency. Interviews were conducted in a structured manner with the help of a questionnaire. The sample size for this study consisted of 100 participants. Among them, 50 were breeders, while 8 were experts from various backgrounds, including practitioners, researchers, Pempatan Village officials, Bumdes (Village-owned enterprises), the Department of Agriculture and FeedCrops, and the Department of Industry and Trade. Additionally, two respondents were honey-collecting traders, and 40 respondents were consumers. Farmer respondents were selected using a quota sampling method based on the number of *Trigona sp*. honey bee breeders in the Pempatan Village area, Rendang District, Karangasem Regency. Secondary data was obtained from review of literature and related documents, such as official reports from the Regional Government and the Central Statistics Agency of Rendang District, Karangsem Regency.

Variable

The variables observed in this research were internal and external factors. These factors were analyzed through the employment of the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) frameworks. This analysis aimed to identify and evaluate the Strengths, Weaknesses, Opportunities, and Threats associated with these components. The Paired Comparison approach (Kinnear, 1996) was employed to evaluate the weight and score of each factor. Afterward, the cumulative internal and external factors scores were inputted into the IE matrix to determine the company's position in the honey farming business (David, 2004). Alternative strategies were formulated by matching all existing Strengths, Weaknesses, Opportunities, and Threats factors using the SWOT analysis method (Rangkuti, 2014).

DISCUSSION

Internal and External Environment Analysis

Analysis of the internal and external environment of the business is an in-depth analysis of the conditions of the *Trigona sp*. honey bee farming business carried out by the community in Pemapatan Village, Rendang District, Karangasem Regency. This analysis aims to determine the strengths and weaknesses of breeders and the opportunities and threats they face (Putri, 2017).

Based on surveys, in-depth interviews, and literature reviews, it was found that several strengths and weaknesses factors must be taken into account when developing business strategies to increase community income in Pempatan Village. These internal factors are given weights and ratings (Table 4.1) and then arranged into an IE matrix (Figure 4.3).

Table 4.1 Determination of Ratings and Scores for Internal Factors

Defining Factor	Weight	Rating	Score
Strength Factor			
Trigona sp. bees bred in Pempatan Village are indigenous bees with exceptional environmental adaptability.	0.08	3.00	0.254
Availability of abundant bee feed sources	0.12	4.00	0.482
Environmental conditions that support the development of beekeeping	0.12	4.00	0.482
The human resources of farmers are typically in their prime working years, which facilitates the adoption and implementation of technological advancements.	0.08	4.00	0.339
The *Trigona sp.* honey has a distinctive natural flavor that varies according to the seasonal feed availability	0.12	4.00	0.482
Short distribution channels	0.04	3.00	0.121
Prices are relatively	0.04	3.00	0.121

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affordable			
Natural regeneration process	0.08	3.00	0.254
The authenticity of the honey is guaranteed	0.12	4.00	0.482
Sub Total			3.018
Weakness Factors			
Lack of comprehension of honey harvesting techniques among farmers	0.04	1.00	0.040
Breeders only focus on honey, while propolis has not been adequately managed.	0.00	1.00	0.004
Honey has not been packaged properly	0.04	1.00	0.040
The sanitary conditions during the production process are suboptimal.	0.04	1.00	0.040
Product marketing has not been executed properly	0.04	2.00	0.080
The resulting products have not been able to penetrate the industrial market	0.00	2.00	0.009
Limited Internet network availability	0.01	3.00	0.040
Sub Total			0.254
TOTAL			2.763

Based on the analysis of internal condition factors, the main strengths of the *Trigona sp.* honey beekeeping business in Pempatan Village are 1) Availability of abundant bee feed sources, 2) Environmental conditions that support the development of beekeeping, 3) The *Trigona sp.* honey has a distinctive natural flavor that varies according to the seasonal feed availability, and 4) The authenticity of the honey is guaranteed. These four factors are the main strengths, with a score of 0.482. The main weakness of the *Trigona sp.* honey bee farming business in Pempatan Village is that product marketing has not been executed properly, with a score of 0.080.

Based on surveys, in-depth interviews, and literature studies, it was found that several opportunity and threat factors are important to pay attention to in efforts to determine business strategies to increase community income in Pempatan Village. Table 4.2 provides weights and ratings for these external factors, which are then arranged in an IE matrix (Figure 4.3).

Table 4.2 Determination of Ratings and Scores for External Factors

Defining Factor	Weight	Rating	Score
Opportunity Factor			
There is strong support from the government, especially the Forest Service, for developing the *Trigona sp.* beekeeping business.	0.18	4.00	0.719
The demand for *Trigona sp.* honey is high	0.18	3.00	0.539
Limited availability of good quality *Trigona sp.* honey on the market	0.11	4.00	0.449
Market access is expanding.	0.06	3.00	0.169
Easy promotional media	0.11	3.00	0.337
The phenomenon of individuals adopting "back to nature" lifestyles.	0.18	4.00	0.719
The development of various beauty products derived from *Trigona sp.* honey	0.06	3.00	0.169
Sub Total			3,101
Threat Factors			
Feed availability is influenced by natural factors	0.11	2.00	0.225
There is a great deal of imitation or mixed *Trigona sp.* honeys circulating at significantly lower prices.	0.01	1.00	0.011
Trigona sp. honey colonies are starting to develop from outside Bali	0.01	1.00	0.011
Sub Total			0.247
TOTAL			2.854

Based on examining external condition factors, two primary opportunities can be identified in the *Trigona sp.* honey bee farming business in Pempatan Village. Firstly, there is strong support from the government, especially the Forest Service, for developing the *Trigona sp.* beekeeping business; secondly, the phenomenon of individuals adopting "back to nature" lifestyles. These two factors are the main opportunities with great potential for exploitation, with a score of 0.719. The main threat posed by this business is the availability of feed,

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which is subject to natural influences. Variations in feed availability have a direct impact on the flavor, consistency, and overall quality of the honey produced, as indicated by a score of 0.225.

Internal External Matrix

The Internal External Matrix is used to determine the positioning of the *Trigona sp.* honey bee farming business carried out by the Pemapatan Village community in the industry. Based on the internal and external factors analysis, the EI matrix can be constructed by integrating the score values from the IFE and EFE tables. The *Trigona sp.* honey bee farming business carried out by the people of Pempatan Village is in cell V in the IE matrix (Figure 4.4).

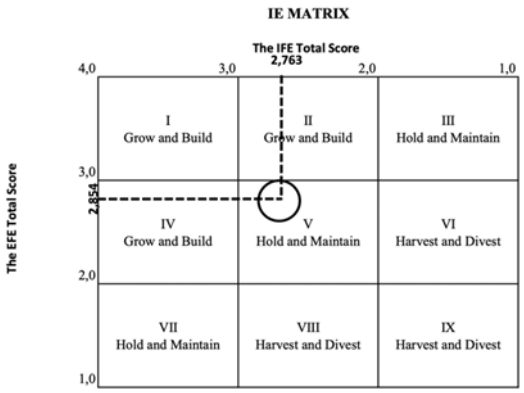

Figure 4.4 IE Matrix of the *Trigona sp.* Honey Bee Farming Business in Pempatan Village

Cell V in the IE matrix is included in the Hold and Maintain division with strategies that can be implemented in the form of market penetration and product development.

Business Strategy

Based on the results of the IFE EFE, IE, and SWOT analysis that has been carried out, an alternative strategy for the *Trigona sp.* honey bee farming business in Pemapatan Village can be formulated in order to improve the community's economy. The proposed plan is outlined as follows:

1. Enhancing product quality stability through the adoption of total quality management (TQM)
   The quality of honey produced by breeders in Pempatan Village is quite diverse. This variation is influenced by the availability of bee feed, maintenance management, breeder knowledge, skills in the harvest process, and post-harvest handling, including packaging. The variability in the quality of honey could impact customer satisfaction and decrease customer motivation toward repeat purchases.

   Implementing total quality management is the right strategy to increase product quality stability. Total quality management can be implemented to achieve continuous improvements and improvements in product quality.

2. Differentiate the types of honey according to the type of feed
   The *Trigona sp.* bees raised in Pempatan Village feed on the pollen of various flowering trees in the forest surrounding the village. Due to the variety of species and flowering seasons, the *Trigona sp.* honey produced by Pempatan Village beekeepers is available in several variants. There are three main types of nectar used as bee feed: *Nangi* wood flower nectar from January to February, Calliandra flower nectar from March to May, and *Kayu Sendok* flower nectar from November to December. Meanwhile, from June to August, bee feed comes from various flowers available that month (multiflora).

   This uniqueness, if it is not packaged well, will have a negative impact on consumer judgments because of variations in flavor, viscosity, and physical attributes of honey. Implementing a differentiation strategy based on honey kinds can potentially leverage the distinct characteristics of various honey varieties, thereby generating new market opportunities and competitive advantages within the industry. Apart from that, the honey produced by breeders in Pempatan Village is raw honey without any heating, pasteurization, or processing. Therefore, all the enzymes and natural goodness contained therein are still well preserved (Kinoo et al., 2012; Sereia et al., 2015).

3. Improve breeder skills and apply appropriate technology in the honey harvesting process

   Honey bee farmers in Pempatan Village harvest bees using a simple method without properly implementing SOP (Standard Operational Procedure). Variations in the skill of breeders during the harvesting process led to disparities in the resultant quality of honey. Apart from that, during the harvesting process, *Trigona sp.* bees are often squeezed, resulting in the resulting *Trigona sp.* honey being contaminated with bacteria. In order to increase the uniformity of the honey quality, various trainings need to be carried out to improve breeders' skills and apply appropriate technology in honey harvesting.

4. Maintain the stability of feed availability by planting plants that are feed sources for bees.
   Most of the *Trigona sp.* bee feed cultivated in Pempatan Village comes from flower nectar that grows in the forests around the Village. This feed source is available in abundance from January to May, sourced from the nectar of the flowers of the Nangi and Calliandra trees, and from November to December, sourced from the nectar of the flowers of the Spoonwood tree. From June to August, the available flower nectar comes from various plants around the village, with limited availability. Feed scarcity from June to August significantly impacts

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low honey production. It often leads to colony loss, as bees must venture out for feeding alternative locations. In order to enhance the bee colony capacity in Pempatan Village and promote year-round productivity, it is essential to increase efforts to cultivate bee feed plants that can bloom consistently throughout the year.

5. Applying packaging technology to ensure product quality and attractiveness.

   The packaging of *Trigona sp.* honey produced in Pempatan Village is inadequate. It employs used containers (syrup bottles and mineral water bottles) without labels and product descriptions (Figure 4.5).

Figure 4.5 Honey Products in Pempatan Village

Such packaging creates a negative perception among consumers, including notions of poor hygiene, reduced product value, and hindered repurchasing due to the absence of labels and manufacturer information on the container.

Figure 4.6 Design of packaging stickers for the front, back, and seal of the bottle cap

The packaging design was carefully crafted to enhance consumer appeal by incorporating both aesthetic appeal and informative elements, hence facilitating product understanding and education. The primary purpose of bottle seal stickers is to ensure the safety and authenticity of the product while also serving to guarantee its quality and enhance the aesthetic appeal of the packaging.

6. Applying digital marketing and e-commerce in honey marketing

   Significant transformations in this New Normal era have occurred in market dynamics, particularly in consumer behavior. Notably, there has been a notable shift from traditional offline shopping practices to a growing preference for online purchasing. Digital disruption has changed consumer behavior and demands in shopping, wanting it to be faster, more practical, cheaper, and able to shop anywhere (Kasali, 2017). To win the market competition in the current economic landscape, it is important for business entities, such as *Trigona sp.* honey beekeepers in Pempatan Village, to adopt digital marketing and e-commerce strategies to promote and sell their honey products.

7. Applying the Penta Helix concept in developing the *Trigona sp.* honey bee farming business

   Collaboration with various related institutions and governments is needed to improve the performance of *Trigona sp.* beekeepers in Pempatan Village. The right collaboration to be implemented in developing the *Trigona sp.* beekeeping business is the Penta Helix concept. This concept involves collaborative partnerships among academia, business entities, local communities, government bodies, and media organizations. It is hoped that this collaborative effort will enhance the expansion and advancement of the *Trigona sp.* beekeeping business, hence fostering improvements in the village's local economy.

CONCLUSION

Based on the conducted analysis and subsequent discussion, it can be deduced that: 1) Pempatan village exhibits promising potential for developing the *Trigona sp.* honey bee farming business; 2) A total of 16 internal strategic factors, comprising 9 strengths and 7 weaknesses, as well as 10 external strategic factors, encompassing 7 opportunities and 3 threats, play a pivotal role in the formulation of strategies for the development of the *Trigona sp.* honey bee farming business; 3) Seven strategic recommendations are provided, with the implementation of packaging technology to assure product quality and attractiveness being the highest priority.

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