The development strategy of *Trigona sp* beekeeping at SMKN 4 Luwu

Kurnia, Syamsu Alam and Andi Sadapotto

Faculty of Forestry, Hasanuddin University, Perintis Kemerdekaan KM. 10 Street, Tamalanrea, Makassar, South Sulawesi, Indonesia 90245

Email: sadapotto@unhas.ac.id

Abstract. Forest has various sources that can be utilized and honey is one of the non-timber forest products produced from *Trigona sp* beekeeping at SMKN 4 Luwu. This research is intended to describe the *Trigona sp* beekeeping business and identify the internal and external factors as the strength, weaknesses, opportunities and challenges from beekeeping business and so it can be formulated a good strategy to be carried out with using SWOT matrix. The analysis result shown the Strength, Weakness, Opportunity Threats. The alternative strategy that can be applied to develop the beekeeping business based on the analysis result of SWOT which dealing with the government for capital support, deligating the members to participate in beekeeping training, the availability of sustainable feed sources, utilizing the modern technology, using the compelling packaging, implementing the SOP in the packaging process so that the packaging is more hygienic, increasing the production volume, selling with competitive price, marketing the products through technology and keeping the school environment safety by installing the CCTV in the area of beekeeping business.

I. Introduction

Forest has a lot of sources that can be useful for society either from the local community or public community. The paradigm of using forest products that only focuses on woods will be changed gradually into other using forest products, namely NTFP (non-timber forest products) and forest ecosystem service. Honey is one of the non-timber forest products that has been utilized in Indonesia [1]. *Trigona sp* livestock products that have been widely used are honey and propolis.

Honey is one of the beekeeping products and is included in non-timber forest products. The potential of honey development in Indonesia is adequate large which is supported by tropical climate factors and forest sources that can be as the ecosystem of honey bee farms. The honey bee is one of the forest sources that have a good potential to be developed in the cultivation. This is due to the abundant feed source (almost all plants that produce the flowers can be the feed source) either from forest plants, agricultural crops, or plantation crops [2].
SMKN 4 Luwu is one of potential school and eligible for the location of beekeeping since SMKN 4 Luwu has entrepreneurship curriculum, ready-to-work human resources, large plantation area which support the beekeeping. Plantation area is good for bee cultivation such as rambutan plantation, corn, mangoes, and flower garden which become the feed source for the honey bee.

The vision and mission of the directorate general of vocational development are to enhance the vocational high school students to be professional, able to compete and be independent, vocational high school students are expected to compete and become reliable and competent entrepreneurs based on each field, especially the vision of SMKN 4 Luwu Forest Product Engineering Expertise is to Create the Labor Force of forestry with good behaviour, creative, independent, and have environmental insight that is prepared to go into the forestry employment. SMKN 4 Luwu is one of potential school and eligible for the location of beekeeping since SMKN 4 Luwu has entrepreneurship curriculum, ready-to-work human resources, large plantation area which support the beekeeping. Plantation area is good for bee cultivation such as rambutan plantation, corn, mangoes, and flower garden which become the feed source for the honey bee.

Based on the information from the local community around the school of SMKN 4 Luwu that Trigona sp bee is often found however not all societies conduct its beekeeping. The local community around SMKN4 Luwu mostly do not know how to cultivate Trigona sp bee and is also influenced by other supporting factors. The supporting factors are socio-economic community condition, climate, the availability of feed, and the potential of natural resources to support Trigona sp bee cultivation. Trigona sp beekeeping of forestry department at SMKN 4 Luwu has not run well since there is no strategy study about beekeeping development which is applied in the beekeeping’s activity in school.

Pertaining to the issue above, this research was carried out to collect the information about the beekeeping at SMKN 4 Luwu, the internal and external factors that influenced the beekeeping in which the future development strategy is formulated to expect SMKN 4 of forestry department becomes better.

2. Research methodology

2.1. Time and research setting
This research was conducted at SMKN 4 Luwu of forestry department, Barammamase Village, Walenrang Sub-District, South Sulawesi Province. The research was conducted in June-November 2020.

2.2. Data collection method
Data collection can be conducted through primary and secondary data. Primary data is directly obtained from the observation for discovering the initial condition of the research object, and the
interview was given to 22 respondents using question lists (questionnaires) which are made earlier. While secondary data is collected from document studies and data related to the institute.

2.3. Data analysis
This research utilized descriptive analysis with SWOT technique analysis. The formulation of an alternative strategy is performed using SWOT analysis like Strengths, Weaknesses, Opportunities, and Threats. Strengths and weaknesses are identified as internal factors whilst opportunities and threats are identified as external factors.

SWOT can be categorized into 4 group strategies such as SO (strengths-weaknesses), WO (weaknesses-opportunities), ST (strengths-threats), and WT (weaknesses-threats) (David 2009)[3]. The SWOT analysis matrix format is provided in the table below.

| Internal Factors | Strengths   | Weaknesses  |
|------------------|-------------|-------------|
| Opportunities    | Strategy S-O| Strategy W-O|
| Threats          | Strategy S-T| Strategy W-T|

3. Results and discussions
3.1. The general explanation of research setting
The location of beekeeping is in the area of SMKN 4 Luwu, Poros Palopo Street – Masamba KM 14 Karetan, Barammamase Village, Walenrang Sub-district, Luwu Regency, South Province. The geographical location of SMKN 4 Luwu is 02° 53’ 05.5” LS and 120° 09’ 24.1” BT. This location has a good prospect in producing the honey because the location is not far from the plantation, agricultural crops, and flower garden planted in the school environment which becomes the food source or bee feed which is raised by forestry students of SMKN 4 Luwu.

3.2. Identification of internal and external development factors of beekeeping at SMKN 4 Luwu.
The development strategy of beekeeping is formulated first to identify the internal and external factors that influence beekeeping. Based on the research [4] mentioned that the internal factors of beekeeping in Kalampangan village comprised: workers, production, marketing while the external factors are government, competitor, technology, and environment. Those are closed to the research done by Setiawan, et al (2016) [2] that stated the human resource, production, marketing and the price as internal factors while government, environment, and consumer as the
external factor of beekeeping development at SMKN 4 Luwu. Based on the research in fields and preliminary studies, the internal and external factors beekeeping at SMKN 4 Luwu are presented in table 2 and table 3 below.

**Table 2. Internal Factor Strategy**

| No | Internal Factor Strategy | Strengths (S) | Weakness (W) |
|----|--------------------------|---------------|--------------|
| 1  | Human Resources          | The members of honey farmers have been given a material and practice of beekeeping | The member have never participated in the training |
| 2  | Capital                  | Capital assistance from school | The difficult of capital assistance for maintainance until honey harvest |
| 3  | Product                  | Honey product is completely pure | Very limited product |
| 4  | Price                    | There is are pricing | Price tends to be cheap |
| 5  | Production Equipment     | Using the production Equipment | Using the manual equipment production |
| 6  | Marketing                | Short marketing channel | There has not been promotion using technology and the packaging is not attractive |
| 7  | Enviromental Safety      | The business safety is hampered | |

*Source: Primary Data Analysis, 2021*

**Table 3. Opportunity and Threats in developing the honeybee at SMKN 4 Luwu.**

| No | External Factor Strategy | Opportunity (O) | Threats (T) |
|----|--------------------------|-----------------|-------------|
| 1  | Government               | There is a support from the governement | Climate change |
| 2  | Consumer                 | The consumers’ trust on the product | There is no technological use on the production process, promotion, and collecting the information |
| 3  | Environment              |                 | There has not been permanent partners in promoting the product |
| 4  | Technology               |                 | |
| 5  | Partnership              |                 | |

*Source: Primary Data, 2021*
3.2.1 Strengths (S)

a. The Participation of Member of The Group (human resources) in The Training
   The amount of human resources that involved in the beekeeping at SMKN 4 Luwu is 19 people. It becomes the main factor in establishing the organisation or business group.

b. The capital assistance
   The member of business group at SMKN 4 Luwu has gained a capital money from the school of SMKN 4 Luwu, for buying the seeds, creating the bee house, purchasing the manual production equipment and maintenance cost.

c. The pure honey product
   One of the product produced by bee is a honey. Honey is a thick liquid produced by flower nectar. honey produced from bee is collected modern extraction methods in the form of a clear liquid and free from foreign object. The honey produced from the beekeeping at SMKN 4 Luwu is a pure honey, the texture is thick, not watery, it sticks if touches everything and does not drip like a water.

d. Short marketing channel
   The marketing channel in the beekeeping at SMKN 4 Luwu is the shortest channel and simple without a middleman [5]. The consumers who buy the product is for their own consumption.

3.2.2 Weaknesses

a. limited group business members participating in training
   business group of SMKN 4 Luwu is 19 members which do not join any training from the government. It has an impact on knowledge transfer that is less than optimal. Besides, the members and total members always change every year that depend on the students of grades XI furthermore, students/members focus on the main duty as students and teachers have concerned as educators. This beekeeping is merely a side job.

b. The difficulty of capital assistance for maintenance until harvest
   Capital is a fundamental element in business, including the beekeeping business. The operational activity can not be carried out without adequate capital (Subagio, et al, 2017)[6]. From the capital side, the business group of SMKN 4 Luwu obtains from school assistance and the self-help group is built for maintenance costs until harvest. Additional capital is highly necessary to develop the business group of beekeeping. It can be gained if the group of farmers has partnerships or support from the government periodically when the group need it. After sufficient capital, the group is expected can be independent to evolve the beekeeping.

c. The price tends to be cheap
   Price is one of the elements related to the revenue except for the cost and acceptance. The income of beekeeping at SMKN 4 Luwu in carrying out the beekeeping business will be better if the honey is eligible. However, it is not in line with expectations. The business group of SMKN 4 Luwu sells their honey product at a low price if it is compared to the quality nevertheless the honey price can be 100.00,- of 450 ml on the market.

d. The production equipment used is manual
   Production equipment is the input of non-human and physical used in economic production value such as machine and tools. For the group business of SMKN 4 Luwu, in conducting the
maintenance and care, permanent, packaging, and marketing are still carried out traditionally and manually which mean using the human’s working will obtain less than optimal results.

e. No promotion

   promotion is a form of market communication, market activity spreads the information, influence/persuade and or remind the market object or company and its product to be willing to accept, buy, and be loyal to the products offered by the company concerned. The beekeeping at SMKN 4 Luwu is not being promoted, either from electronic media and etc. The marketing is still from mouth to mouth or around the village area.

f. The packaging is not attractive

   The packaging product of beekeeping at SMKN 4 Luwu is still simple as it is packaged with normal bottles of 330 ml, 600 ml, till 1.500 ml. In packaging, there is no trademark, halal label, and other requirements that are usually owned by other honey products. It is indicated that the packaging is not attractive and not eligible to be marketed on a larger scale.

3.2.3 Opportunities

a. Government support

   The business group of beekeeping at SMKN 4 Luwu has obtained supports from government in the school also has conducted a program and comparative study to the group of beekeeping and directly observe the product processing using modern technology at Meli region in Luwu Utara Regency.

b. The consumers’ trust in the product

   Product is a thing that can be offered to market to get attention, bought, used, or consumed that can gratify the desire or need, including variety, quality, design, features, brand and packaging [7]. To have the consumers’ trust, the first step to do is giving a good impression to consumers, having good communication, providing a reasonable price, and presenting a good quality. In the business of beekeeping at SMKN 4 Luwu, the consumers who come directly to producers have believed in the quality of honey because they see it for themselves. However, there are few consumers only since the market area is not very wide, and the amount of honey production is still relatively small that becomes the obstacle factor.

3.2.4 Threats

a. Climate Change

   Climate change can influence the production and quality of honey. It is in line with the research that has conducted by Yunita, et al (2019) [4] mentioned that the climate is a primary thing in supporting the beekeeping caused by hot air which makes honey bees more aggressive than usual so the breeders have difficulty in the stage of making queen bees, splitting and merging of honeybee colonies. This is exactly the opposite of the rainy season, bees will often stay inside the box and can not find any food that will make the honey production reduced. Accordingly, breeders are accused to adapt with climate change. Apart from the climate, the famine also can influence honey bee production. There is no available food at famine which leads the bee colony to experience a lack of feed situation.
b. Not utilizing the technology
The development of information technology impacts all human life, including the beekeeping business. The members of the business group can search various spread information on social media related to beekeeping. Nevertheless, several members and students have not utilized technology development to have the information about the honey bee caused by the unavailability of access. In marketing product, which is conducted through marketing system of oral communication, and information from people to people or mouth to mouth.

c. There is no permanent partnership in marketing the results
In the development of SMKN 4 Luwu school is the beekeeping at SMKN 4 Luwu as a part of school activities, the cooperation between the business group and partnership (market players) is highly crucial. Nonetheless, the business group of SMKN 4 Luwu does not have a permanent partnership in marketing the products. The farmers directly sell the honey to the consumers nearby the school.

3.2.5 The alternative strategy in developing the beekeeping at SMKN 4 Luwu
Based on the data processing result obtained, the internal factor is 628 and the external factor is 326. Both of them have positive value so the main strategy is determined at quadrant 1 with coordinates (628, 326) therefore the main strategy is (S - O) which using the strengths to reach the opportunity, here is the main graphic strategy of Figure 1.

![Development Strategy Diagram](image-url)
Based on the data analysis results and score of internal and external environmental factors of developing the beekeeping at SMKN 4 Luwu, it is formulated one main strategy namely S-O, afterwards to support the realization of the beekeeping development at SMKN 4 Luwu, 3 supporting strategies were formulated, namely W–O strategy, S–T strategy, and W–T strategy. After identifying the internal and external factors that are strengths, weaknesses, opportunities, and threats in the beekeeping business at SMKN 4 Luwu, then an alternative strategy is formulated that can be implemented in enhancing the beekeeping business of beekeeping at SMKN 4 Luwu, Barammamase Village in the future.

| Table 4. Strategy with SWOT matrix beekeeping development at SMKN 4 Luwu. |
|---------------------------------------------------------------|
| **INTERNAL** | **STRENGTHS (S)** | **WEAKNESSES (W)** |
| 1. There is entrepreneurship material and field practice of beekeeping for members/students | 1. The members have not participated in the training | |
| 2. There is capital assistance | 2. The difficulty of additional capital for maintenance cost until harvest | |
| 3. Pure honey product | 3. The price tends to be cheap | |
| 4. Short marketing channel | 4. The production equipment used is manual | |
| 5. There has not been any promotion via electronic technology | 5. There has not been any promotion via electronic technology | |
| 6. The packaging is not attractive | 6. The packaging is not attractive | |
| 7. Environmental safety for business is not guaranteed | 7. Environmental safety for business is not guaranteed | |
| **EXTERNAL** |
| **Opportunities (O)** | **Strategy SO** | **Strategy WO** |
| 1. There is support from the government | 1. Intensifying the relation between government and business group to develop honey products (S1,S2,O1) | 1. Conducting training regularly and thoroughly for the members of business group SMKN 4 Luwu (W1, O1) |
| 2. Consumers’ trust in the products | 2. Increasing the production and the quality of honey to scale up the consumers’ loyalty (S3, O2) | 2. Utilizing government support to gain additional capital and cooperate with agents or consumers who have high selling (W1, O1) |
3. Finding marketing partnership and creating a clear marketing system (S4, O1)

3. Using sophisticated technology for beekeeping to have quality honey and utilizing the technology information to enhance the selling promotion (W4, W5, O2)

4. Having the attractive packaging for market’s need (W6, W5, O2)

5. Maintaining business safety with CCTV

| Threats (T)                                      | Strategy ST                                      | Strategy WT                                      |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| 1. Climate change                               | 1. Increasing the training (field school, and etc) | 1. Using sophisticated technology to obtain a better honey production (W4, W3, T2) |
| 2. Not using technology to discover information | and utilizing the technology information to develop honey products (S1, S2, T2) | 2. Conducting either direct promotion or through media (W5, W2, W6, T2, T3) |
| 3. There has not been a permanent partner in marketing products | 2. Finding a marketing partner and creating a clear marketing system (S2, S3, S4, T3) | 3. Carrying out the training periodically to figure out how to adapt to climate change (W1, T1) |

Source: Primary Data Analysis, 2021

4. Conclusion
Internal factors (strengths and weaknesses) and external (opportunity and threats) of beekeeping development at SMKN 4 Luwu which is included: making training for members of the farmer group, capital assistance, pure honey product, short marketing channel. The weaknesses are: the members who have not participated in the training, the difficulty of additional capital for maintaining cost, price tends to be cheap, the production equipment is manual and there has not been any promotion. while the opportunities are: achieving government support and consumers’
trust in the product. Threats are climate change, not utilizing the technology to collect information, and there is no permanent partnership to promote the result. The beekeeping business at SMKN 4 Luwu still requires further development. The alternative strategy implemented begins by reinforcing the relation amongst government, farmers, partnerships, production increase, honey quality, and the beekeeping training periodically, implementing cultivation technology and information technology for marketing products, and the use of attractive packaging which will upgrade the consumers’ attractiveness and protect the business safety by installing CCTV in the beekeeping business area at the school environment.

References

[1] Moko H 2008 Menggalakkan hasil hutan bukan kayu sebagai produk unggulan Inf. Tek. 6 1–6
[2] Setiawan A 2017 Strategi pengembangan usaha lebah madu kelompok tani setia jaya di desa rambah jaya kecamatan bangun purba kabupaten rokan hulu Selodang Mayang J. Ilm. Badan Perenc. Pembang. Drh. Kabupaten Indragiri Hilir 3
[3] David F R 2009 Strategic Management: Manajemen Strategi Konsep, Edisi kedua belas Jakarta (ID): Salemba Empat
[4] Yunita Y, Pordamantra P and Berkat A P 2019 Strategi Pengembangan Budidaya Lebah Madu di Kelurahan Kalampangan Kecamatan Sabangau Kota Palangka Raya J. Socio Econ. Agric. 14 62–71
[5] Kotler P and Keller K 2007 Manajemen Pemasaran, edisi ke 12, Jilid 1, Jakarta: PT Indeks Kelompok Gramedia
[6] Putri Subagio K M and Dzulkirom AR M 2017 Analisis Pengelolaan Modal Kerja Dalam Upaya Meningkatkan Likuiditas Dan Profitabilitas (Studi Pada PT. Gudang Garam Tbk Periode 2014-2016) J. Adm. Bisnis 51 15–24
[7] Keller K dan 2011 Manajemen Pemasaran (PT Indeks)