

ANALYSIS OF IFAS, EFAS STRATEGIES AND FEASIBILITY OF MANGOT CULTIVATION BUSINESS TO REDUCE HOUSEHOLD WASTE

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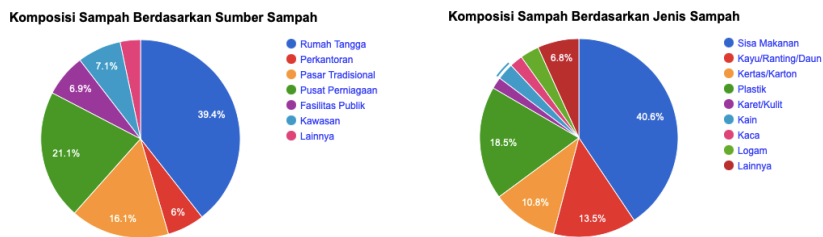
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Article Info	Abstract
Received July 31, 2023 Revised September 20, 2023 Published October 25, 2023	<i>This research aims to analyze the strategy and feasibility of the Renon Trash Maggot (RTM) Joint Business Group (KUBE) Maggot cultivation business located in Renon Village, Denpasar City. This business helps break down household waste, in its role of caring for sustainable development, using analytical methods. EFAS, EFAS, SWOT Matrix, QPSM where the results of the analysis found that the business of KUBE RTM is in the Growth and Build zone, and strategies that are suitable for this zone are intensive (market penetration, product development) or integration (backward integration, forward integration, and horizontal integration) and from the business feasibility financial aspect of the net present value (NPV) analysis the results are positive, the internal rate of return (IRR) results are 30%, the profitability index (PI) results are > 1, namely 1,2 times and the business payback period (PP) is 10 months, 28 days.</i>
Keywords : IFAS, EFAS, SWOT Matrix, QPSM, Business Feasibility	

INTRODUCTION

The Brundtland Report (WCED, 1987) describes it from three aspects: economic, societal and environmental. One possible approach is sustainable waste management, sustainable waste management influences the achievement of Sustainable Development Goals (SDGs) targets, especially SDGs 1, 8 and 12 (Aminah & Muliawati, 2021). Waste or rubbish that is not managed properly is one way to reduce climate change, and its use can have an impact on improving the community's economy (Rukmini, 2020).

Data from national waste management shows that in 2022 the largest composition of waste based on waste type will be food waste at 40.6% (Graph 1) and based on waste source the highest percentage will be household waste at 39.4% (Graph 2). (Dewi et al, 2021; Rambet et al, 2015)



Graphs 1 and 12: Waste Composition Graph based on Waste Source and Type of Waste, 2023
Source :<https://sipsn.menlhk.go.id/sipsn/>

Food waste is a common challenge that needs to be addressed at the root (<https://sipsn.menlhk.go.id/sipsn/>). One of the household waste processing innovations currently being developed using the bioconversion method, (Newton et al, 2005) defines bioconversion as the transformation of organic waste into a source of methane energy through a fermentation process involving living creatures such as bacteria, fungi and insect larvae to make compost. which involves bacteria as remodeling organisms (Rambet et al, 2015)

Black Soldier Fly(BSF) or black soldier fly is one of the insects whose characteristics and nutrient content are beginning to be widely studied. This fly originates from America and then spread to subtropical and tropical regions of the world. BSF babies are Maggots which are useful in the process of decomposing organic materials because Maggots consume vegetable and fruit waste (Da Rizano and Rifin, 2022; Čičková et al, 2015). Maggot's ability to break down waste is very fast. Maggots are used in agriculture as fertilizer and in animal husbandry as poultry and fish feed because they have high protein value (Pramudani, 2020)

Bali as a tourist destination is also a promising opportunity for maggot cultivation, the high level of waste in Bali, including waste from industry, community groups that have developed maggot cultivation, namely the Renon Trash Maggot (RTM) Joint Business Group (KUBE) located on Jl. Tukad Badung XXI No.12, Renon, South Denpasar, Denpasar City, Bali, which was founded in 2022, this business was established not solely to seek profit but rather to care for

household waste which is the largest waste in Bali, which can be directly generated. which will support sustainable development (Dewi et al, 2021)

The development of KUBE RTM maggot breeders since its establishment has seen an increase in growth, but even though there has been a significant increase in the maggot cultivation business, this does not mean that there are no obstacles and challenges in its development. (Ernawati et al, 2023). (Selviani & et al, 2022) Strategy is very necessary for the future existence of this business. The purpose of this research is to analyze the EFAS, IFAS, SWOT Matrix and QPSM needed to determine this business development strategy (Astari et al, 2021; Priantari et al, 2022; Santhi et al, 2020), this strategy can then be a reference for the feasibility of the business which is also analyzed, financial aspects consisting of financial and non-financial aspects. so that it can produce additional strategies and profits from this business ((Sudiartini & et al, 2020; Selviani et al, 2022).

RESEARCH METHODS

The research method used in this research is a qualitative descriptive method. This method is used to analyze the sustainability of Black Soldier Fly (BSF) maggot cultivation. The research was conducted at the Joint Business Group (KUBE) Renon Trash Maggot (RTM), in Renon Village, Denpasar, which was carried out over four months, namely March-June 2023. The data used used raw data and additional data. Primary data collection was obtained through field surveys and direct interviews with maggot cultivation business actors, while secondary data collection was obtained from existing journals. This research collected data through direct observation, interviews and discussions with research subjects. Data collection used interview techniques and direct observation of several respondents (namely internal and external respondents). Internal respondents consist of business owners, while external respondents are customers, suppliers and government. Data analysis techniques in this research include qualitative and quantitative. Qualitative data processing, namely strategic analysis using EFAS and IFAS, SWOT Matrix and QPSM, as well as feasibility analysis from non-financial aspects such as market and marketing aspects as well as technical and technological aspects, environmental aspects, management and HR aspects, and legal aspects, while feasibility analysis from aspects According to Kasmir and Jakfar (2012), financial finance is assessed

from: Net Present Value (NPV) is a comparison between net cash PV (PV of proceeds) and investment PV (capital outlays) over the life of the investment. The difference between the two PV values is what we know as net present value (NPV); Internal Rate of Return (IRR) is a tool for measuring the rate of return on internal results, Profitability Index (PI) is the activity ratio of the total present value of net income to the present value of investment expenditure over the life of the investment. Payback Period (PP) is used to look at the time period or return on investment for a project or business, with the expected result being that the current PP value is smaller than the life of the investment. All aspects of feasibility are calculated through assessment criteria according to the number of indicators and will be given a score according to the assessment from the questionnaire given to management, employees, suppliers and consumers (Kasmir, 2015).

After each aspect is assessed based on the score table that has been created, the classification is then determined into 5 categories as follows (Arikunto and Suharsimi, 2010):

- $\geq M_i + 1.5 S_{Di}$ = very good/very decent
- $M_i + 0.5 S_{Di} < M_i + 1.5 S_{Di}$ = good/decent
- $M_i - 0.5 S_{Di} < M_i + 0.5 S_{Di}$ = quite good/fairly decent
- $M_i - 1.5 S_{Di} < M_i - 0.5 S_{Di}$ = not good/not worthy
- $< M_i - 1.5 S_{Di}$ = not good/not feasible.

The formula for finding the ideal average score is:

- $M_i = 1/2$ (highest ideal score – lowest ideal score)
- $S_{Di} = 1/6$ (highest ideal score – lowest ideal score).

RESULTS AND DISCUSSION

General Conditions of Research Locations

Research was conducted on the Renon Trash Maggot (RTM) Joint Business Group (KUBE) located in Renon Village, South Denpasar, Denpasar City. This business was established in February 2022. RTM is a business fostered by the Renon Village Community Empowerment Institute (LPM). Denpasar, this business has six members and currently this business has two BSF fly cages, 50 waste storage boxes, 10 bioponds for pupa breeding and 1 waste chopper.

To date, RTM has produced up to 300 kg of wet maggots in one month, and almost all of the maggot harvest has been sold and often cannot meet demand. The

selling price for wet maggots is Rp. 10,000 per kg, while prepupae are sold for up to Rp. 15,000/100 grams or Rp. 150,000 per Kg. With the rapid sales of maggot crops, of course RTM wants to develop its business not only to reach the local market but also wants to expand its marketing to domestic and even international markets. For this reason, steps are needed to analyze strategies and business feasibility analysis, so that RTM can work more optimally in developing its business.(Astari et al, 2021; Priantari et al, 2022) (Ernawati et al, 2023), where the analysis carried out includes:

Internal Analysis and External Factor Analysis Summary (IFAS and EFAS), and IE Matrix with results:

The main strength possessed by KUBE RTM (data in table 1) is in the quality of the dried maggot product because it is more durable with a score of 0.461, this indicates that consumers feel that the dried maggot product from KUBE RTM is better than other maggot products, so this business We must further maintain and improve the quality of this dried maggot product, even though there is an obstacle, namely that the dried maggot product depends on sunlight, but because this is a superior product, it is hoped that this business can find solutions and alternatives for drying maggots so that it doesn't just rely on sunlight. The weakness factor of the KUBE RTM business lies in its very simple management with a score of 0.330,(Pramudani, 2020)

Based on the scoring presentation in table 1, it shows that the biggest opportunity for this business lies in public awareness of organic products, which will expand organic farmers who will later need fertilizer from maggot cultivation with a score of 0.634, this identifies the importance of increasing public awareness of organic food from organic farming, Socialization about maggot fertilizer needs to be increased so that it will influence demand growth. The threat analysis that received the smallest score was that competitors' products were more innovative with a score of 0.068. This needs to be watched out for because if the market becomes competitive, product innovation is the biggest threat for KUBE RTM, it is necessary to prepare product innovations early so that they can expand the market.(Astari et al, 2021; Priantari et al, 2022; Selviani et al, 2022).

Internal External (IE) Environmental Analysis

Based on the results of the IFE and EFE analysis, a total IFE score of 3.642 and a total EFE score of 3.366 were obtained. From these results it can be concluded that KUBE RTM is in quadrant I in the IE Matrix (as shown in figure 1) as well as the results of the grand strategy are in quadrant I, (figure 2). According to (David, 2017), quadrant I means this business is in the Growth and Build zone. Strategies that are suitable for this zone are intensive (market penetration, product development) or integration (backward integration, forward integration and horizontal integration) (Ohimain et al, 2014; Pramudani, 2020; Astari et al, 2021; Da Rizano and Rifin, 2022).

SWOT Matrix (Strength Weakness Opportunities Threats)

This matrix can clearly illustrate how the external opportunities and threats faced by KUBE RTM as in Figure 5, are adjusted to its strengths and weaknesses. This matrix can produce four sets of possible strategic alternatives. In SWOT analysis there are four strategies, namely SO strategy, WO strategy, ST strategy and WT strategy (Rangkuti, 2015), the mapping results obtained 15 alternative strategies as in the SWOT analysis matrix diagram (figure 3) (Selviani et al, 2022; Priantari et al, 2022).

Quantitative Strategic Planning Matrix (QSPM) Analysis

The formulation is based on calculations carried out with AS values (*Attractiveness Score*) and TAS (*Total Attractiveness Score*). The AS value shows the attractiveness of each strategy for its key factors. Alternative QSPM strategies can be implemented by KUBE RTM in order of urgency based on the QSPM score (table 3). These results confirm research from (Čičková et al, 2015; Astari et al, 2021) (Sudiartini et al, 2020)

Business Feasibility Analysis

Feasibility of Non-Financial Aspects

Feasibility of Marketing and Marketing Aspects is related to whether or not there is potential and market opportunities from the results of KUBE RTM maggot cultivation, since its inception consumers have consisted of 50% agricultural business actors, 40% livestock and fisheries and the other 10%, demand from

consumers has reached 10,000 kg per month, but currently it can only fulfill a maximum of 30% so there is no problem with the market because it already has *its segmented markets*. From the 4 market and marketing aspect criteria, a score of 4.25 was obtained with the highest score being 5 (Table 4) by calculating the feasibility score formula, the market and marketing aspect was categorized as "very feasible" (Sudiartini et al, 2020; Rukmini, 2020)

The second aspect, namely Technical and technological aspects are the lifeblood of KUBE RTM, because it is in this aspect that business activities are carried out. From table 4 above, it can be seen that the average score of the indicator criteria that are met is 6.9, if seen from the assessment category, technical aspect and technology has a score between 5.84 - 7.51 so that it can be categorized, in terms of technical and technological aspects, KUBE RTM is said to be "feasible" to run. The results of this analysis are the same as research from Priantari et al, 2022; Astari et al, 2021, because cultivation businesses have opportunities in the future, with cheap raw materials that will never run out, this business only needs to be consistent in production and maintain quality, so that it can grow bigger.

Based on Table 4, the next aspect, namely the environmental aspect, has five indicators used for feasibility assessment. It can be concluded that in terms of the environmental aspect, KUBE RTM has an average score of fulfilled indicator criteria, namely 7.4, when viewed from the category. assessment, the environmental aspect has a score above the very decent score category, namely >3.74 , so it can be categorized "**very worth it**" to run, this is because this cultivation business is categorized as a business that cares about sustainable development, because this business does not produce any hazardous waste and does not damage natural resources. This result is in line with research from Pramudani, 2020; Dewi et al, 2021; Da Rizano and Rifin, 2022.

The next aspect is the management and human resources aspect with the assessment indicators for this aspect totaling seven indicators (Table 4). From the results of the scoring assessment it can be concluded that in terms of the management and human resources aspects, KUBE RTM has an average score value of the indicators that are met at 3.42, and is in the criteria between a score of 2.92 - 4.08, so that the management and human resources aspects are categorized as "**quite decent**" These results confirm the research results from (Sudiartini et al, 2020; Priantari et al, 2022). This is because this business is still very simple, only run by

6 people and the help of freelance workers who are contracted according to the job, so many assessment criteria have not been carried out thoroughly. optimal, such as an unclear organizational structure, and a career path that cannot be realized because this business is still in the development stage.

The legal aspect is the last aspect analyzed in this research, KUBE RTM has seven assessment indicators, the average score of the indicators that are met is 2.1, if seen from the assessment category, the legal aspect has a score between 1.5 - 2, 5, so it can be concluded that from a legal aspect the KUBE RTM cultivation business is said to be **“not worthy”** to be carried out, but the legal aspect is regarding the documents that must be prepared and currently we have processed several documents needed to prepare for development from the local level to the local level, which will expand to the domestic market and even the international market in the future (Priantari et al, 2022; Selviani et al, 2022).

Financial Aspect Feasibility

The financial aspect is analyzed to determine the amount of costs that will be incurred and the income that will be received as well as determining the proportion of funding sources from KUBE RTM, even though the funds spent at the start are not very large, this business must also be analyzed for its financial feasibility. The feasibility indicators from non-financial aspects can be measured from:

Calculation *Net Present Value*(NPV) is carried out to find out whether this cultivation business has good profit potential in the future so it is worth doing.

NPV calculation (data in table)

$$\text{NPV formula} = [\text{Cash flow} / (1+i)^t] - \text{Initial investment}$$

$$\text{NPV} = [\text{Rp. } 23,725,032 / (1+0.1)^1] - \text{Rp. } 20,050,000$$

$$= \text{Rp. } 1,518,210$$

The result of the NPV calculation is Rp. 1,518,210 NPV values are positive. This means that the maggot cultivation business from KUBE RTM is projected to be profitable and "feasible" to continue (Astari et al, 2021; Selviani et al, 2022)

Internal Rate of Return (IRR)

Internal Rate of Return(IRR) is a method for calculating the interest rate that can equalize the present value of all cash inflows with the cash outflows from an investment made by KUBE RTM

IRR formula

$$IRR = i_1 + NPV_1 - NPV_2 / i_2 - i_1$$

Information:

IRR = Internal Rate of Return

i_1 = Discount rate that produces NPV +

i_2 = Discount rate that produces NPV –

NPV1 = Positive Net Present Value

NPV2 = Negative Net Present Value

The results of the IRR calculation can be seen in the table. 30% is taken from the NPV value at a positive discount factor and NPV at a negative discount factor. Because this value is more than the bank interest rate in effect at the time the research was carried out, namely 10%, it can be concluded that the Maggot cultivation business by KUBE RTM in Denpasar City **"worth" doing (Ohimain et al, 2014; Rahayu, 2015).**

Profitability index(PI) benefit and cost ratio (B/C ratio) is the activity of the sum of the present value, net income and the present value of investment expenditure over the life of the investment from KUBE RTM.

Formula :

$$PI = \frac{\sum \text{Net Cash PV}}{\sum \text{Investment PV}} \times 100\%$$

$$PI = \frac{\text{Rp. 23,725,032}}{\text{Rp. 20,050,000}} \times 100\% = 1.2 \text{ Times}$$

Based on the calculation results, it is known that the PI value is 1.2, which indicates that the value of the benefits obtained in this business is 1.2 times the value of the costs incurred for 1 (one) year at an interest rate of 10%. Because the PI value is > 1, cultivating KUBE RTM maggots is "feasible" (Pramudani, 2020; Da Rizano and Rifin, 2022)

Payback Period(PP) is the period for returning the investment value through net cash receipts from the KUBE RTM business with the following calculation:

$$\text{Payback Period} = n + (a/b) / (c/b) \times 1 \text{ Year}$$

Where :

n : The last year where the cumulative cash flow value was still negative

a : Initial investment value

b : Cumulative amount of cash flow value in the nth year

c : Cumulative amount of cash flow in year n+1

With these values, the following calculations can be obtained:

$$\begin{aligned} &= 10 + (20,050,000 - 19,470,860) / (21,497,946 - 19,470,860) \\ &= 10 + (579,140) / (2,027,086) \\ &= 10 + 0.28 \\ &= 10, 28 \end{aligned}$$

From the results of the detailed calculations above, the Payback Period (PP) of the KUBE RTM maggot cultivation investment is 10 months, 28 days, this time is very short considering that the cultivation costs are very minimal and the market price of maggots is still good on the market so the profits are quite large and the return on business capital less than 1 year

From the overall financial aspect indicators, it can be concluded from the results of the average score of 5 (Table) and this value is above the criteria, namely ≥ 3.01 , so it can be concluded that from the financial aspect of Renon Trash Maggot (RTM) Joint Business Group (KUBE) maggot cultivation. categorized as "very feasible" to continue (Begas, 2020; Dewi & et al, 2021; Astari & et al, 2021).

CONCLUSION

The results of the IFAS and EFAS analysis show that the KUBE RTM maggot cultivation business is currently in quadrant I, meaning the company is in the Growth and Build zone. Strategies that are suitable for this zone are intensive (market penetration, product development) or integration (backward integration, forward integration, and horizontal integration), from the SWOT Matrix and Quantitative Strategic Planning Matrix (QSPM) analysis, the strategy that has the highest score must be made a priority, namely increasing promotion and literacy both offline and online; analysis of business feasibility, non-financial conclusions are drawn, including from non-financial aspects, namely the market and marketing aspect has a score of 4.25 in the "very feasible" category, the engineering and technology aspect has an average score of 6.9 in the "feasible" category. while the environmental aspect received an average score of 7.4 "very adequate", the legal aspect received a score of "Not Appropriate". The results of the analysis of financial aspects including Net Present Value (NPV) obtained a positive value so it was

categorized as feasible, from the calculation of the Internal Rate of Return (IRR) 30% and it was said to be feasible, the calculation from the Profitability Index for this business obtained a return of 1.2 times the investment issued, and the Payback Period (PP) calculation for this business is 10 months 28 days and all financial aspects are categorized as feasible, because the average score from the feasibility category is 5 above the ≥ 3.01 category, so it can be concluded that from the financial aspect of cultivation maggot Joint Business Group (KUBE) Renon Trash Maggot (RTM) is categorized as "very feasible" the legal aspect received a score of "Inadequate". The results of the analysis of financial aspects including Net Present Value (NPV) obtained a positive value so it was categorized as feasible, from the calculation of the Internal Rate of Return (IRR) 30% and it was said to be feasible, the calculation from the Profitability Index for this business obtained a return of 1.2 times the investment issued, and the Payback Period (PP) calculation for this business is 10 months 28 days and all financial aspects are categorized as feasible, because the average score from the feasibility category is 5 above the ≥ 3.01 category, so it can be concluded that from the financial aspect of cultivation maggot Joint Business Group (KUBE) Renon Trash Maggot (RTM) is categorized as "very feasible" the legal aspect received a score of "Inadequate". The results of the analysis of financial aspects including Net Present Value (NPV) obtained a positive value so it was categorized as feasible, from the calculation of the Internal Rate of Return (IRR) 30% and it was said to be feasible, the calculation from the Profitability Index for this business obtained a return of 1.2 times the investment issued, and the Payback Period (PP) calculation for this business is 10 months 28 days and all financial aspects are categorized as feasible, because the average score from the feasibility category is 5 above the ≥ 3.01 category, so it can be concluded that from the financial aspect of cultivation maggot Joint Business Group (KUBE) Renon Trash Maggot (RTM) is categorized as "very feasible"

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Attachment

Table 1
IFAS Matrix
Renon Trash Maggot (RTM) Joint Business Group (KUBE)

No	Internal factors	Weight	Rating	Score
1	Investment is relatively cheap because it does not require electricity, chemicals and simple infrastructure.	0.06	3.75	0.225
2	The results of cultivation in the form of Maggot contain high protein 40-48% and fat 25-32%, so it is a quality product that is really needed by fish.	0.113	3.25	0.367
3	The raw material from the use of organic waste is in the form of food waste so that it becomes something that has added value.	0.065	3.5	0.228
4	Low operational costs and easy cultivation process	0.097	3.62	0.352
5	Dried maggot products from Renon Trash Maggot (RTM) are quality because they last longer in storage.	0.119	3.87	0.461
1	Business management is still simple	0.088	3.75	0.330
2	There is no fixed budget for promotion	0.124	3.55	0.440
3	The product from maggot larvae / BSF is still not well known because it is new so it needs more socialization and promotion	0.112	3.85	0.431
4	Currently, prices for dried larval products are still relatively expensive because the process relies on sunlight	0.117	3.65	0.427
5	The cultivation process cannot be carried out in the rainy season because BSF breeding requires hot temperatures	0.105	3.65	0.383
Amount		1	36.45	3.6442

Source: Rangkuti (2015) data processed, 2022

Table 2
EFAS Matrix
Renon Trash Maggot (RTM) Joint Business Group (KUBE)

No	External Factors	Weight	Rating	Score	
1	Opportunities	It is possible that market growth will increase because literacy about the benefits of maggot larvae / BSF will be wider.	0.118	3,725	0.439
2		Public awareness of organic products will expand organic farmers who will later need fertilizer from maggot cultivation	0.175	3,625	0.634
3		Currently, fertilizer products have affordable prices, so they are in demand by farmers who work in the organic sector	0.119	3.25	0.3867
4		Currently there are very few competitors with the same business, especially in the Denpasar City area, so this is a very big opportunity	0.188	3.25	0.611
1	Threats	Market growth is possible that competitors will emerge who also cultivate maggots.	0.18	3.65	0.657
2		A decrease in selling prices due to the large number of competitors.	0.15	3,125	0.468
3		Competitor products are more innovative.	0.025	2,725	0.068
4		The quality of competitors' products is better	0.045	2.25	0.101
Amount		1		3,366	

Source: Rangkuti (2015) data processed, 2023

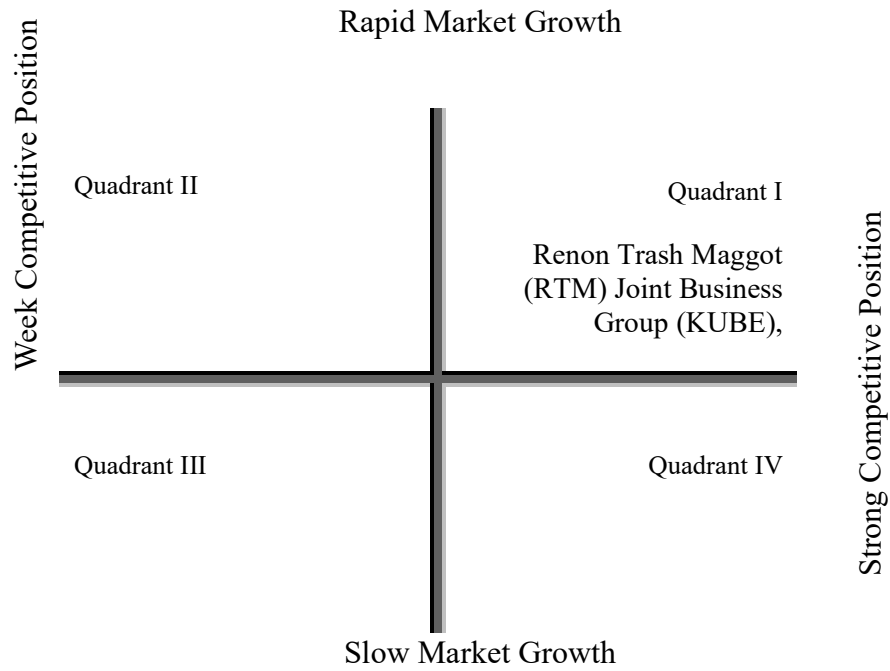


Figure 1 GS matrix of processed data
 Source: David and David (2017), data processed in 2023

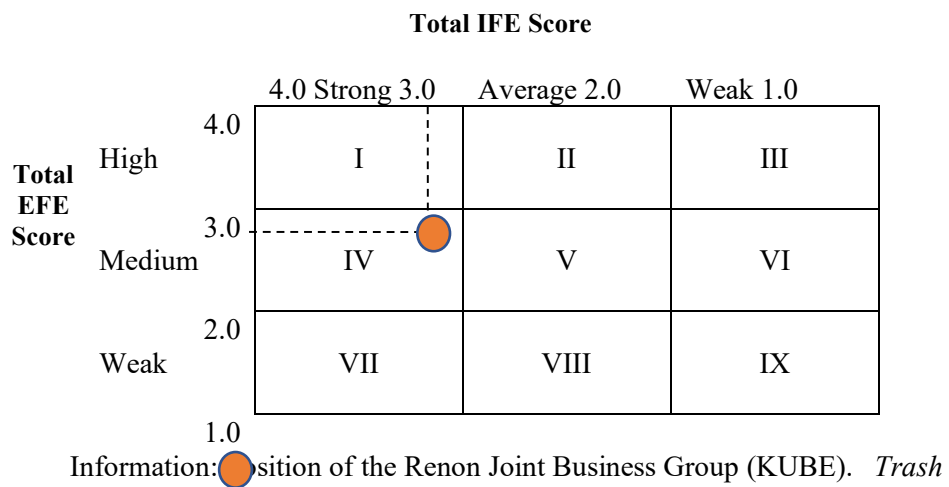


Figure 2 IE Matrix
 Source: David and David (2017), data processed in 2023

<p>IFAS</p> <p>EFAS</p>	<p>Strength (S)</p> <p>a) Business investment is relatively cheap</p> <p>b) Maggots contain high protein</p> <p>c) Organic waste raw materials</p> <p>d) Competitors are still limited</p> <p>e) Quality and durable products</p>	<p>Weakness (W)</p> <p>a) Simple management</p> <p>b) Maggot products are not widely known</p> <p>c) The price of dried larval products is still high</p> <p>d) If the rainy season cannot produce</p>
<p>Opportunity (O)</p> <p>a) Market growth</p> <p>b) Public awareness of organic products is increasing</p> <p>c) Maggot prices are still relatively cheap</p> <p>d) Limited competitors</p>	<p>Strategy (SO)</p> <p>a) Increase production capacity</p> <p>b) Expanding the area to search for raw materials</p> <p>c) Provide competitive prices</p> <p>d) Expanding collaboration with users/consumers</p>	<p>Strategy (WO)</p> <p>a) Forming professional management</p> <p>b) Increasing promotion and literacy both offline and online</p> <p>c) Looking for alternatives for dry larvae production and during the rainy season</p>
<p>Threat (T)</p> <p>a) New competitors emerge</p> <p>b) Selling prices fall</p> <p>c) Competitor products are more innovative</p> <p>d) The quality of competitors' products is better</p>	<p>Strategy (ST)</p> <p>1. Expanding marketing areas</p> <p>2. Creating alternative markets</p> <p>3. Improve product quality</p> <p>4. Develop product innovations.</p>	<p>Strategy (WT)</p> <p>1. Improve the knowledge and skills of management and workers</p> <p>2. Increasing cooperation with the government and private sector</p> <p>3. Responsive to developments in science and technology (science and technology)</p> <p>4. Expanding product understanding literacy to the public</p>

Figure: 3 SWOT Analysis Matrix Diagrams
 Source: Rangkuti (2015) data processed, 2023

Table 3 QSPM table

Renon Trash Maggot (RTM) Joint Business Group (KUBE)

Order	Strategy Alternatives	TAS value
1	Increasing promotion and literacy both offline and online (WO-2)	7.29
2	Forming professional management (WO-1)	7.23
3	Looking for alternatives for dry larvae production and during the rainy season (WO-3)	6.87
4	Developing product innovations (ST-4)	6.78
5	Expanding product understanding literacy to the public (WT-4)	6.48
6	Improving product quality (ST-3)	6.33
6	Responsive to developments in science and technology (WT-3)	6.12
7	Creating alternative markets (ST-2)	6.02
8	Improving the knowledge and skills of management and workers (WT-1)	5.66
9	Expanding cooperation with SO-4 users/consumers)	5.59
10	Increasing production capacity (SO-1)	5.41
11	Expanding marketing areas (ST-1)	5.26
12	Expanding the area to search for raw materials (SO-2)	5.15
13	Increasing cooperation with the government and private sector (WT-2)	5,11
14	Providing competitive prices (SO-3)	4.88

Source: Primary data, processed 2023

Table 4

Non-Financial Aspects Assessment Criteria

Renon Trash Maggot (RTM) Joint Business Group (KUBE)

No	Assessment criteria	Score
Market and Marketing Aspects		
1	The availability of market share is indicated by the fact that all cultivated maggot products are sold	5
2	Products have advantages and distinctive characteristics	5
3	Selling prices are stable and increasing	5
4	Promotion is carried out effectively and efficiently	2
Total Score		17
Average Score for market and marketing aspects		4.25
Criteria $\geq Mi + 1.5 SDi = \geq 3.01$		Very Worth It
Technical and Technological Aspects		
1	Raw materials and additional materials can be obtained easily	9

2	The workforce available meets business needs	7
3	Workers use work safety equipment: a. Headgear b. Face mask c. Gloves d. Apron	6
4	The Black Soldier Fly (BSF) larvae breeding process room is tightly closed	8
5	The space for the puppa breeding process is closed and protected from predators (birds)	8
6	Providing food according to the age of the pup (blended for baby pup)	8
7	Food waste storage areas are always cleaned	3
8	Washing of waste grinding equipment	7
9	The dry maggot production place is clean and tidy	6
10	The dry product storage space and process is clean, dry, and has good air circulation	7
Total Score		69
Average score for technical and technological aspects		6.9
Criteria $Mi + 0.5 SDi < Mi + 1.5 SDi = 5.84 - 7.51$		Worthy
Environmental Aspects		
1	Does not produce waste that causes soil infertility	5
2	Does not produce waste that causes changes in the color, taste and smell of water	5
3	Does not produce waste that causes air pollution	5
4	Do not use materials from natural resources excessively	6
5	The production process does not damage natural resources	6
Total Score		37
Average score for environmental aspects		7.4
Criteria $\geq Mi + 1.5 SDi = \geq 3.74$		Very Worth It
Management and Human Resources Aspects		
1	There is a clear organizational structure according to needs	2
2	Clear division of tasks and responsibilities	4
3	The need for competent human resources is met	4
4	Clear compensation and benefits	4
5	Regular HR training and development	4
6	There is a career development path	2
7	There are sanctions and rewards for employee discipline	4
Total Score		24
Average Score		3.42
Criteria $Mi + 0.5 SDi < Mi + 1.5 SDi = 2.91 - 3.74$		Worthy
Legal Aspects		
1	Have a Taxpayer Identification Number (NPWP)	1

2	Has principle permit management	1
3	Have a building construction permit (IMB)	3
4	Have a disturbance permit (HO)	2
5	Have a trading business license (SIUP)	4
6	Have a company registration certificate (TDP)	2
Total Score		13
Average score for legal aspects		2.16
Criteria $M_i - 1.5 SD_i - < M_i - 0.5 SD_i = 1.5 - 2.5$		Worthy

Source: Suharsimi and Arikunto (1998) Data processed, 2023

Table 4.5
Calculation of Internal Rate of Return (IRR)
Renon Trash Maggot (RTM) Joint Business Group (KUBE)

Month	Cash flow	Interest	Present Value
0	-20,050,000		-20,050,000
1	1,227,086	0.10	1,115,532.7
2	1,427,086	0.10	1,297,350.9
3	1,727,086	0.10	1,570,078.2
4	2,027,086	0.10	1,842,805.5
5	2,227,086	0.10	2,024,623.6
6	2,227,086	0.10	2,024,623.6
7	2,127,086	0.10	1,933,714.5
8	2,227,086	0.10	2,024,623.6
9	2,027,086	0.10	1,842,805.5
10	2,227,086	0.10	2,024,623.6
11	2,027,086	0.10	1,842,805.5
12	2,227,086	0.10	2,024,623.6
		NPV	1,518,210.9
			0.3
		IRR	30%

Source: Primary data processed, 2023

Table 6
Financial Aspect Assessment Criteria
Renon Trash Maggot (RTM) Joint Business Group (KUBE)

No	Assessment criteria	Score
1	<i>Net Present Value</i> (NPV > 0)	5
2	<i>Internal Rate of Return</i> (IRR>profit)	5
3	<i>Profitability Index</i> (PI >1)	5
4	<i>Payback Period</i> (PP <Maximum Payback)	5
Total Score		20
Average Score		5
Criteria \geq Mi + 1.5 SDi = 3.01		Worthy