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Analysis of value-added and operational development strategy for IKM Rumah Kompos Masaro (TPS 3R Bulila) in Telaga District, Gorontalo Regency.

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Abstract
Talumelito Gorontalo landfill capacity is 75% filled. The only TPS 3R that processes organic waste in Gorontalo Regency is TPS 3R Bulila or IKM Rumah Kompos Masaro. IKM Rumah Kompos Masaro collaborates with PT. Masaro produces solid organic fertilizer from the leaves and twigs of the Bulila community. This research aims to calculate added value and analyze strategies for developing operational waste management at the IKM Rumah Kompos Masaro. This research uses qualitative-quantitative descriptive methods, such as direct observation techniques, interviews, and distributing questionnaires. Sampling was carried out using the purposive sampling method. Based on the analysis of added value calculations using the modified Hayami method, it is known that the compost product produced by IKM Rumah Kompos Masaro has an added value of IDR. 563.1 per kg of compost, with a ratio of 47%, which is relatively high. Twelve development strategies that can be implemented to optimize the operations of Rumah Kompos Masaro IKM were formulated using the SWOT method. The highest priority strategy based on the QSPM method analysis is strategy one: carry out innovative outreach regarding waste management so that it can attract public interest and participation.

Keywords: Waste Management, Value-Added Hayami, Development Strategy, SWOT, QSPM

Abstrak
Tempat Pembuangan Akhir (TPA) Talumelito di Gorontalo telah terisi sebanyak 75%. Satu-satunya TPS 3R yang memproses limbah organik di Kabupaten Gorontalo adalah TPS 3R Bulila atau IKM Rumah Kompos Masaro. IKM Rumah Kompos Masaro bekerja sama dengan PT. Masaro memproduksi pupuk organik padat dari daun dan ranting masyarakat Bulila. Penelitian ini bertujuan untuk menghitung nilai tambah dan menganalisis strategi pengembangan operasional pengelolaan limbah di IKM Rumah Kompos Masaro. Penelitian ini menggunakan metode deskriptif kualitatif-kuantitatif, seperti teknik observasi langsung, wawancara, dan penyebaran kuesioner. Pengambilan sampel dilakukan dengan menggunakan metode purposive sampling. Berdasarkan analisis perhitungan nilai tambah menggunakan metode Hayami yang dimodifikasi, diketahui bahwa produk kompos yang dihasilkan oleh IKM Rumah Kompos Masaro memiliki nilai tambah sebesar IDR 563,1 per kg pupuk kompos, dengan rasio 47%, yang tergolong tinggi. Dua belas strategi pengembangan yang dapat diimplementasikan untuk mengoptimalkan operasional IKM Rumah Kompos Masaro diformulasikan menggunakan metode SWOT. Strategi prioritas tertinggi berdasarkan analisis metode QSPM adalah strategi pertama: melaksanakan penyuluhan inovatif terkait pengelolaan sampah agar dapat menarik minat dan partisipasi masyarakat.

Kata kunci: Pengelolaan Sampah, Nilai Tambah Hayami, Strategi Pengembangan, SWOT, QSPM

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1. Introduction

Sustainable development and the economic growth rate, accompanied by increasing population, present various societal problems. The development and growth of the region, with an increase in population, causes an increase in community activities within it, so it requires public services and facilities such as clean water, wastewater, drainage, and waste to support community life. Regional growth that is not in line with the availability of infrastructure to help people's lives can have an impact on decreasing the optimization of regional infrastructure services (Letcher & Vallero, 2011).

The improvements in living standards tend to increase community activities, including consuming goods, thereby generating waste. Increasing community activity can affect the quantity and quality of waste produced, so when it is not managed correctly, it can reduce environmental quality. An area that experiences economic growth is usually followed by increased waste production. However, the increase in waste production has not been accompanied by public awareness of managing waste properly, and the government needs to prepare waste management infrastructure adequately. Waste management in Indonesia is not yet optimal because it still experiences various obstacles in its management, such as economic, social, and cultural, and the application of technology (Letcher & Vallero, 2011).

Based on data from the Ministry of Environment and Forestry in 2020, the amount of waste generated in Indonesia reached 72 tons per year. Hence, each Indonesian resident throws away an average of 0.85 kg of waste daily. The total amount of waste produced is only 40.09%, which is thrown into final disposal sites (TPA), 35.49% is burned, 1.61% is recycled, 7.54% is landfilled, and 15.2% is thrown into roads, rivers, etc., and other land (Prihatin, 2020). Only around 70% of the waste is collected, while the rest is thrown away and causes environmental pollution.

Gorontalo Regency is one of the regencies in Gorontalo Province. Data from the National Waste Management Information System shows that waste production in Gorontalo Regency reached 158.2 tons daily. Waste sources in Gorontalo Regency in 2020 consisted of 102.86 tonnes of household waste, 7.91 tonnes of office waste, 4.75 tonnes from commerce, 18.99 tonnes from markets, 11.08 tonnes from public facilities, 1. 58 tons from the area, and 11.08 tons of other waste (Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia, 2022). The large amount of waste produced and the need for optimal waste management in Gorontalo Province means that the Talumelito TPA is already filled with around 75 percent of the allocated capacity. Structured and targeted waste processing has yet to be implemented well in Gorontalo, especially Gorontalo Regency.

One waste management effort the Gorontalo Regency government carries out is building TPS 3R (*Reduce, Reuse, Recycle Waster Treatment Facility)*. However, facts show that TPS 3R does not run optimally in Gorontalo Regency. Most existing 3R TPS only collect or receive rubbish from the community around the 3R TPS, then clean and sort it according to its type. After they are sorted, the officers sell them to the waste collectors. These collectors will chop the waste into smaller pieces, package it, and

send it to Java to be sold to plastic, glass, and other inorganic waste processing factories.

The Gorontalo Regency Government has established several TPS 3R. TPS 3R Bulila collaborates with PT. Masaro is the only TPS 3R that can process organic waste. TPS 3R Bulila has another name, Small and Medium Enterprises (IKM) Rumah Kompos Masaro. IKM Rumah Kompos Masaro is located in Bulila Village, Telaga District, Gorontalo Regency. TPS 3R was established in 2019 but has only been active again since the end of 2022.

Masaro, or zero waste management, defines waste management systems and technologies that produce zero waste. Masaro aims to change the paradigm regarding waste from a cost center (collect-transport-dispose) to a profit center (sort-transport-process-sell) (Abidin et al., 2021). Masaro technology is designed to process all waste and produce high-value products. Masaro has produced waste-processing fast-decaying products, waste-processing slow-decaying products, and non-decomposing waste-processing products. The waste-processing fast-decaying products are POCI (Pupuk Organik Cair Istimewa / Special Liquid Organic Fertilizer), KOCI (Konsentrat Organik Cair Istimewa/ Special Liquid Organic Concentrate), and biocomposter. Waste processing products that are difficult to decompose are solid compost and liquid compost made with the help of the Masaro biocomposter. Non-decomposing waste-processing products, are biopesticides processed from combustion smoke scrubber fluid in non-decomposable waste-processing plants (Masaro, 2024).

Collaborating with PT. Masaro, IKM Rumah Kompos Masaro processes organic waste from leaves and tree twigs or biological materials that microbes can degrade or are biodegradable into organic fertilizer that can improve soil nutrient management. Organic fertilizer has several advantages, namely having high nutrient levels, better hygroscopicity or ability to absorb and release, and being simply soluble in water to be more easily absorbed by plants (Nurkhasanah et al., 2021). The advantage of Masaro fertilizer, in particular, compared to other chemical fertilizers, is that it does not require large amounts of energy; because it is made from organic ingredients, this product is more environmentally friendly (Nury et al., 2023).

Organic fertilizer is classified into solid organic fertilizer and liquid organic fertilizer. IKM Rumah Kompos Masaro only produces solid organic fertilizer or compost. The fertilizer is processed by workers at IKM Rumah Kompos Masaro manually, so it takes 14 days to become compost. It is old for Rp. 2,500/kg for purchases of less than 100 kg, and Rp. 1800 / kg for purchases of more than 100 kg.

Masaro Technology classifies waste into five categories: fast-decomposing organic waste, slow-decomposing organic waste, waste into energy, recycled waste, and plastic/film waste (Abidin et al., 2021). However, the Masaro Compost House IKM has focused solely on processing twig and leaf waste into solid compost, which falls under the category of slow-decomposing organic waste. Processing leaf and twig waste into compost has implications for the value added. This increased value is due to transforming raw materials into other products after undergoing certain processing

stages. Products with high added value demonstrate greater economic worth than their primary products (Nurhasanah et al., 2020). Therefore, information about the added value resulting from processing leaf and twig waste into compost will aid in developing the IKM Rumah Kompos Masro's business and operations.

This research aims to calculate the added value of compost fertilizer and analyze appropriate strategies for developing waste operations at the IKM Rumah Kompos Masaro.

2. Research Method

This research was conducted for five months, from June to October 2023, at the IKM Masaro Compost House or TPS 3R Bulila, Bulila Village, Telaga District, Gorontalo Regency. It uses a quantitative-qualitative descriptive method, with a direct observation technique, interviews, and questionnaire distribution. The sampling for this study was carried out using the purposive sampling method. Purposive sampling is a sampling technique that uses specific criteria according to the researcher's justification or is determined intentionally with the consideration that the person appointed as a sample is a respondent who knows the most about the problem to be studied (Lukitaningsih & Lestari, 2023).

The study included ten respondents who live around the TPS 3R location and know or are directly involved in the operations of TPS 3R Bulila or IKM Rumah Kompos Masaro, including one Head of TPS 3R Bulila or IKM Rumah Kompos Masaro, one Head of Bulila Village, and five Heads of Hamlets in Bulila Village. It also involved two experts, such as employees of the policy-making service related to TPS 3R and environmental operations in Gorontalo Regency, and one scientist with expertise in the environment and related fields.

Value-added

Value-added was analyzed using the modified Hayami et al., (1987)method. Value-added is calculated by identifying the main components such as inputs, outputs, raw material prices, product selling prices, labor costs, and the contribution of other inputs. Advantages of value-added analysis Hayami et al., (1987) are that this type of analysis can help determine the amount of added value, output value, and business productivity. It can also assist in figuring out the compensation for owners of production factors. Additionally, the principle of added value can be applied to other subsystems beyond processing, such as marketing activities.

Internal-External Matrix

The Internal-External Matrix is called the input stage, which summarizes the basic input information needed to formulate strategies. This matrix is prepared by giving the total weight of the internal factor evaluation (IFE) matrix value on the flat axis and the total weight of the external factor evaluation (EFE) matrix value on the vertical axis. The scale of each axis ranges from 1.00 to 4.00 (David & David, 2017). This matrix is divided into three parts: (1) Divisions in cells I, II, and IV show growth and build strategies, (2) Divisions in cells III, V, and VII can carry out a hold and maintain strategy, (3) Divisions in cells VI, VIII, and IX show the harvest or divest strategy.

Table 1. The Procedure of Hayami et al., (1987) Value-Added Calculation

	Variable	Value
	Output, input, and price	
A.	Output (kg/week)	A
B.	Raw material (kg/week)	B
C.	Labor input (working day/week)	C
D.	Conversion factor	D = A/B
E.	Labor coefficient (working day/kg)	E = C/B
F.	Output price (Rp/kg)	F
G.	Wage rage (Rp/HOK)	G
	Revenue and value added	
H.	Price of raw material input (Rp/kg)	H
I.	Contribution of other inputs (Rp/kg)	I
J.	Output value (Rp/kg)	J = D x F
K.	Value added (Rp/kg)	K = J – I - H
L.	Value added ratio (%)	L = (K/J) x 100%
M.	Labor income (Rp/kg)	M = E x G
N.	Labor share (%)	N = (M/K) x 100%
O.	Profit (Rp/kg)	O = K – M
P.	Profit rate (%)	P = (O/K) x 100%
	Remuneration of production factors	
Q.	Profit margin (Rp/Kg)	Q = J - H
R.	Enterpreneur's profit (%)	R = O/Q x 100%
S.	Labor income (%)	S = M/Q x 100%
T.	Other input (%)	T = I/Q x 100%

SWOT

The SWOT matrix is a matching stage focusing on generating feasible alternative strategies by aligning key external and internal factors. This matrix shows various alternative strategies derived from a comprehensive study of internal (strength and weakness) and external (opportunity and thread) factors. The resulting alternatives are classified into four types of possible strategies (Astika & Okol, 2021): (1) SO strategy is a strategy to use strength by taking advantage of opportunities, (2) WO strategy is a strategy to minimize weaknesses by exploiting opportunities, (3) ST strategy is a strategy to use force to overcome threats, (4) WT strategy is a strategy to minimize weaknesses and avoid threats.

QSPM

The Quantitative Strategic Planning Matrix (QSPM) is called the decision stage. It inputs the information from Stage 1 to objectively evaluate feasible alternative strategies identified in Stage 2. It reveals the relative attractiveness of alternative strategies and thus provides an objective basis for selecting specific strategies. This stage examines the matching stage by determining the Attractiveness Scores (AS). AS is defined as numerical values that indicate the relative attractiveness of each strategy considering a single external or internal factor. Specifically, AS should be assigned to each strategy to indicate the relative attractiveness of one strategy over others, considering the particular factor. The range for AS is 1 = not attractive, 2 = somewhat attractive, 3 = reasonably attractive, and 4 = highly attractive. After that, count the total

attractiveness scores. The higher the TAS, the more attractive the strategic alternative. Lastly, calculate the sum of the total attractiveness score. The magnitude of the difference between the total attractive score in a given set of strategic options indicates the relative desirability of one strategy over another (David & David, 2017).

3. Results and Discussion

Analysis of Value-added of Masaro Compost Fertilizer Production

The value-added analysis in this research uses the modified Hayami et al., (1987) value-added method. Value-added analysis is an analysis of the added value of a commodity due to processing, transportation, or storage in a production process. Added value is an activity that adds value to a product by changing the place, time, and form to make it more attractive to consumers in the market (Novra et al., 2022). The value-added calculation in this research aims to measure the amount of value-added due to changes in the form of waste processed into compost.

Table 2. The Calculation Result of The Value-Added Compost Fertilizer Production by IKM Rumah Kompos Masaro

No	Variable	Value
Output, input, and price		
A.	Output (kg/week)	1,000
B.	Raw material (kg/week)	1,500
C.	Labor input (working day/week)	14
D.	Conversion factor	0.67
E.	Labor coefficient (working day/kg)	0.009
F.	Output price (Rp/kg)	1,800
G.	Wage rage (Rp/HOK)	31,154
Revenue and value added		
H.	Price of raw material input (Rp/kg)	0
I.	Contribution of other inputs (Rp/kg)	636.9
J.	Output value (Rp/kg)	1,200
K.	Value added (Rp/kg)	563.1
L.	Value added ratio (%)	47%
M.	Labor income (Rp/kg)	290.8
N.	Labor share (%)	52%
O.	Profit (Rp/kg)	272.3
P.	Profit rate (%)	48%
Compensation for Factors of Production		
Q.	Profit margin (Rp/Kg)	1,200
R.	Enterpreneur's profit (%)	22.7%
S.	Labor income (%)	24.2%
T.	Other input (%)	53%

The value-added calculation results show that the production/output for one production process is 1,000 kg with an average use of raw materials/input of 1,500 kg consisting of 500 kg of animal waste and 1,000 kg of garbage. The raw materials used here are waste in the form of leaves and twigs, measured in kg. The conversion factor in the calculation above is 0.67, which means that 1 kg of raw material can produce 0.67 kg of product.

The workforce calculated in this research is all workers who play a role in the production process, consisting of two people, with a working time of 14 days in one production. This is because compost fermentation is carried out for approximately 14 consecutive days. The value of the labor coefficient is 0.009, which means that to process 1 kg of raw materials/input, 0.00.9 workers are needed, so if process 1 kg of raw materials/input, 0.009 person-days (Hari orang kerja/HOK) are required. The raw materials/input price is IDR 0.00 per kg; the input raw materials used are leaf and twig waste. The contribution of other inputs used in one production process per kg of raw materials is IDR. 663.95 per kg. This study's average output value of compost fertilizer was IDR 1,200 per kg.

The value-added of each kilogram of raw materials is IDR 563.1 per kg. This value-added product depends on the cost of purchasing raw materials, namely the price of leaf and dry waste. Rp. 0.00/Kg, the contribution of other inputs is Rp. 636.9, and the output price per kilogram is Rp. 1,800. The value-added ratio of compost fertilizer is 47%. This means that processing waste into compost provides a value-added of 47% of the production value, which is considered high. Based on Baihaqi et al., (2020), there are three indicators of the value-added ratio: if the value-added ratio is <15%, then the value-added is low; when the value-added ratio is 15% - 40%, the value-added produced is classified as moderate; and if the value-added ratio is > 40%, then it is classified as high.

Workers' income from one process of producing waste into compost is Rp 31,154 daily, or 52% of the company's revenue. Thus, the profit received by IKM Rumah Kompos Masaro due to value added is 48% or Rp. 272.3. per kg, so this compost fertilizer product gets a value-added of Rp. 563.1 per kg. As part of the remuneration for production factors, it is known that the profit margin is IDR. 1,200 per kg. This value is obtained from the subtraction of the output value of Rp. 1,200 with a raw material price of Rp. 0 because trash and animal waste are free of charge. The value of the profit margin is 22.7%, while the value of labor income is 24.2%.

This differs from other input margins, which reach more than half of the compensation for production factors, namely 53%. The profit obtained by IKM Rumah Kompos Masaro is not significant. Still, it must be maintained and increased by reducing the costs of other inputs needed in one production process.

Analysis of the Operational Development Strategy for Waste Management at IKM Rumah Kompos Masaro

Results of Internal-External Matrix Analysis

Determining the strategy in the first or input stage uses internal factors evaluation and external factor evaluation analysis (IFE-EFE Matrix). The IFE matrix is used to determine how big the role of the internal factors in the company. Based on the distribution of questionnaires to respondents, the results obtained from the internal factors evaluation analysis by researchers can be seen in Table 3.

Table 3. The Internal Factor Evaluation (IFE) Matrix for Operational Development Strategy for IKM Rumah Kompos Masaro

No	Internal Factors	Weight	Rating	Value
	Strengths			
1	There is TPS 3R manager who plays an active role	0.150	4	0.524
2	Availability of buildings and supporting equipment	0.103	2	0.246
3	Some people know the method of sorting waste	0.081	2	0.154
4	Able to process organic waste	0.064	2	0.096
5	The community understands the benefits of the IKM Rumah Kompos Masaro	0.103	2	0.246
6	There is cooperation with the Regency Government and related regional office	0.107	3	0.267
7	Collaborating with PT. Masaro	0.068	2	0.109
	Weaknesses			
1	The distribution of tasks for managing the IKM Rumah Kompos Masaro is not yet structured	0.068	2	0.109
2	The availability of human resources does not yet meet the human resources needs at the IKM Rumah Kompos Masaro	0.085	2	0.171
3	The knowledge and training provided to human resources and the community regarding waste management are not yet intensive	0.060	1	0.084
4	IKM Rumah Kompos Masaro's cashflow has not been properly recorded	0.056	1	0.072
5	There is no clarity regarding the source of funds to support the running of the IKM Rumah Kompos Masaro program	0.056	1	0.072
	Total	1	23	2.151

Internal-external matrix data processing also requires external factor evaluation data (EFE Matrix). The EFE matrix determines the influence of the company's external factors. Based on the distribution of questionnaires to respondents, Table 4 shows the analysis results from the evaluation of external factors that researchers obtained.

Table 4. The External Factor Evaluation (IFE) Matrix for Operational Development Strategy for IKM Rumah Kompos Masaro

No	External Factors	Weight	Rating	Value
	Opportunities			
1	The products can support organic farming	0.118	2	0.259
2	It has the potential to improve the community's economy	0.144	3	0.390
3	There are support programs from various related regional offices	0.096	2	0.173
4	There is assistance from the training facilitator	0.134	3	0.334
5	Can solve the waste problem in Bulila Village	0.112	2	0.236

	Threats			
1	There is no legal regulation yet with the village government	0.070	1	0.090
2	Lack of law enforcement tools regarding waste management	0.080	2	0.120
3	Minimal budget allocation from the APBD for 3R-based waste management	0.070	1	0.090
4	Government programs regarding waste management at every level (national, provincial, regional) operate independently	0.091	2	0.155
5	There is no certainty about the market for compost products produced by IKM Rumah Kompos Masaro	0,086	2	0.137
	Total	1	19	1.984

Internal factor analysis with IFE obtained a strength value of 1.643 and a weakness value of 0.509, so the total matrix score was 2.151. Analysis of external factors with EFE gets an opportunity score of 1.392 and a threat value of 0.593, so the total EFE matrix value is 1.984. Next, the total score of these two matrices determines the position and strategy of Rumah Kompos Masaro IKM on the IE matrix.

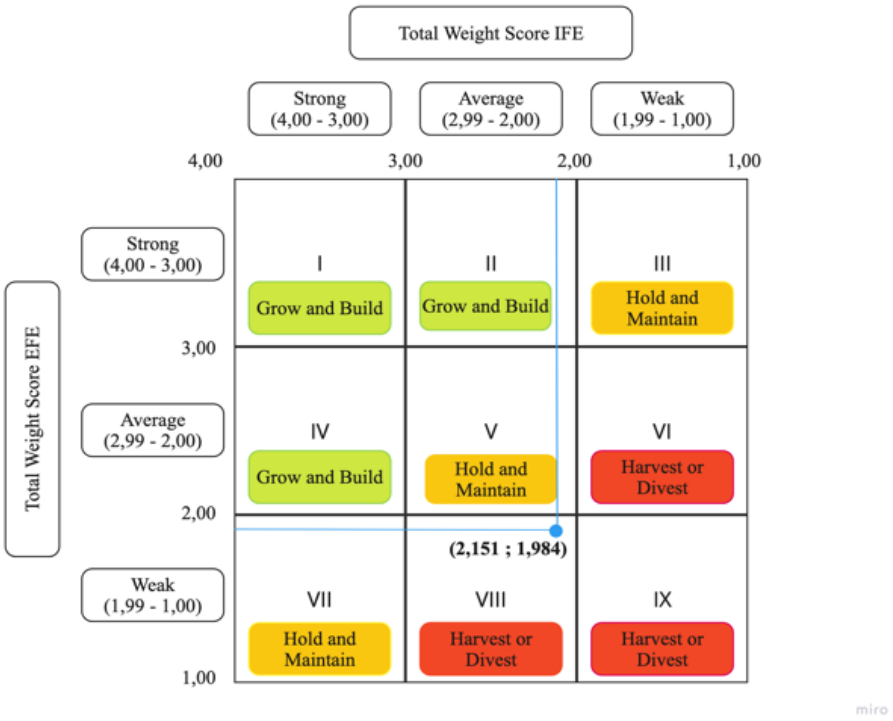

Figure 1. Analysis of Internal and External Factors of IKM Rumah Kompos Masaro

This matrix consists of 2 dimensions: the X-axis's total IFE matrix score and the Y-axis EFE matrix. The Internal-External (IE) matrix combines the results of the IFE and EFE matrices. The IE matrix aims to determine business conditions. Based on the matrix values in Figure 1, the position of TPS 3R Bulila or IKM Rumah Kompos Masaro is in cell VIII. This position indicates that the strategy needed by Rumah Kompos Masaro IKM is harvest or divestment or harvesting or disposal (David & David, 2017).

Cell VIII includes divestment, diversification conglomerate, and liquidation strategies (Astika & Okol, 2021).

The position of cell VIII shows that the strategy needed is related to the company's growth. Conglomerate diversification is a necessary strategy in this growth phase. The conglomerate diversification strategy is a growth strategy that carries out unrelated business activities and can be applied when the company faces a competitive position that could be stronger. The attractiveness value of the industry is meager. This second factor forces companies to invest in other companies (Utami et al., 2022). A conglomerate's diversification strategy also means a strategy regarding adding new products or services that are not related to new customers. TPS 3R Bulila, or IKM Rumah Kompos Masaro, has just produced solid compost fertilizer. Therefore, the addition of new products, such as liquid compost and coenzymes, could be a solution to create innovation and could be an alternative for product development through product diversification.

Results of SWOT Matrix Analysis

The SWOT method analyzes strengths, weaknesses, opportunities, and threats that can be used to compare a company with competitors. The purpose of this matrix is to produce alternative strategies. Based on the results of the IFE matrix and EFE matrix, which analyze strengths, weaknesses, opportunities, and threats to produce alternative strategies that IKM Rumah Kompos Masaro will implement in Figure 2.

Internal Factors Evaluation / External Factor Evaluation	**Strength**	**Weakness**
	1. There is TPS 3R manager who plays an active role 2. Availability of buildings and supporting equipment 3. Some people know the method of sorting waste 4. Able to process organic waste 5. The community understands the benefits of the IKM Rumah Kompos Masaro 6. There is cooperation with the Regency Government and related regional office 7. Collaborating with PT. Masaro	1. The distribution of tasks for managing the IKM Rumah Kompos Masaro is not yet structured 2. The availability of human resources does not yet meet the human resources needs at the IKM Rumah Kompos Masaro 3. The knowledge and training provided to human resources and the community regarding waste management are not yet intensive 4. IKM Rumah Kompos Masaro's cashflow has not been properly recorded 5. There is no clarity regarding the source of funds to support the running of the IKM Rumah Kompos Masaro program
Opportunity 1. The products can support organic farming 2. It has the potential to improve the community's economy 3. There are support programs from various related regional offices 4. There is assistance from the training facilitator 5. Can solve the waste problem in Bulila Village	**SO Strategies** 1. Carrying out innovative outreach related to waste management to attract community interest and participation (S3, O3, O4, O5) 2. Carrying out research and development of TPS 3R products by diversifying products such as making liquid compost and eco-enzymes (S1, S2, S4, O1, O2) 3. Increasing cooperation with the government, agencies, and PT Masaro by optimizing infrastructure and assistance with waste management (S1, S3, S7, O4)	**WO Strategies** 1. Organize the distribution of structured management tasks by involving the community and related agencies (W1, W3, O1, O4, O5) 2. Develop the accounting system to manage the finances of IKM Rumah Kompos Masaro (W2, W4, O2) 3. Increasing community knowledge and skills by providing outreach services from government and private agencies regarding waste management in IKM Rumah Kompos Masaro (W2, W3, O1, O2, O4, O5)
Thread 1. There is no legal regulation yet with the village government. 2. Lack of law enforcement tools regarding waste management 3. Minimal budget allocation from the APBD for 3R-based waste management 4. Government programs regarding waste management at every level (national, provincial, regional) operate independently. 5. There is no certainty about the market for compost products produced by IKM Rumah Kompos Masaro.	**ST Strategies** 1. Increase cooperation with the government and related regional offices in determining legal regulations for waste management (S1, S3, S4, W1, W2, T1, T2) 2. Optimizing the use of infrastructure to anticipate limited funds in waste management (S2, S4, S5, T3, T4) 3. Involving the community in waste management and the use of resulting compost (S3, S5, S6, O5)	**WT Strategies** 1. Establish an organizational structure based on waste management legal regulations and the methods of providing sanctions (W1, W2, T1, T2) 2. Providing support to national, provincial, and regional government programs regarding the financing of the waste subsector and optimizing waste retribution (W4, W5, T3, T4) 3. Collaboration with other parties such as the private sector, NGOs, or agricultural services to commit to accepting and utilizing the compost products (W5. T4. T5)

Figure 2. SWOT Analysis Results for Operational Development Strategy for IKM Rumah Kompos Masaro

Results of QSPM Matrix Analysis of Masaro Compost House SME Operational Development Strategy

Priority strategies are determined using QSPM matrix analysis. This analysis is carried out after the strategy analysis stage using the IFE-EFE matrix and SWOT matrix. The QSPM method is intended as a priority strategy decision-making stage.

Table 5. The results of QSPM Analysis of Operational Development Strategy for IKM Rumah Kompos Masaro

No	Alternative Strategies	Total Attractive Score	Ranking
1	Carrying out innovative outreach related to waste management to attract community interest and participation	6.280	I
2	Carrying out research and development of TPS 3R products by diversifying products such as making liquid compost and eco-enzymes	5.631	VIII
3	Increasing cooperation with the government, agencies, and PT Masaro by optimizing infrastructure and assistance with waste management	5.169	X
4	Organize the distribution of structured management tasks by involving the community and related agencies	5.676	VI
5	Develop the accounting system to manage the finances of IKM Rumah Kompos Masaro	5.646	VII
6	Increasing community knowledge and skills by providing outreach services from government and private agencies regarding waste management in IKM Rumah Kompos Masaro	5.879	III
7	Increase cooperation with the government and related regional offices in determining legal regulations for waste management	5.859	IV
8	Optimizing the use of infrastructure to anticipate limited funds in waste management	5.290	IX
9	Involving the community in waste management and the use of resulting compost	5.882	II
10	Establish an organizational structure based on waste management legal regulations and the methods of providing sanctions	5.728	V
11	Providing support to national, provincial, and regional government programs regarding the financing of the waste subsector and optimizing waste retribution	5.161	XI
12	Collaboration with other parties such as the private sector, NGOs, or agricultural services to commit to accepting and utilizing the compost products	5.146	XII

The results of the QSPM analysis have 12 alternative strategies, which have different total attractive scores (TAS). The QSPM matrix can determine the main strategies that are priorities to be implemented in the Masaro Compost House IKM. Analysis based on the questionnaire results regarding selecting alternative strategies that show priority alternatives by respondents. The company must implement the

alternative strategy with the highest TAS value (Sutarni et al., 2018). Companies can combine opportunities and strengths to make the right decisions at critical times to improve the company's conditions for better success. Based on the analysis results, it is known that strategy 1, carrying out innovative outreach related to waste management to attract community interest and participation, is a priority strategy with a value of 6,280.

The first alternative is the top priority to be implemented because it is crucial to conduct innovative socialization to attract public interest and participation when implementing community-based 3R waste management sites. This approach involves active community involvement and empowerment of their capacity (Krisnawansyah, 2019). Community participation in waste management can raise awareness about environmental cleanliness and health. It also strengthens community initiatives to maintain, preserve, and improve ecological functions (Sulistiyorini et al., 2015). Implementing exciting and innovative socialization can help develop community perspectives on waste management. This activity aims to increase community motivation, innovation, and ability in environmentally friendly waste management, such as compost production, so the proposed strategies can be more readily accepted and applied.

The second order, with a value of 5.882, is strategy 9, which involves the community in waste management and using compost produced. This community-based waste management strategy is a model of approach in waste management that is oriented towards handling waste originating from its source through efforts to reduce waste generation by encouraging the use of goods that can be reused and decomposed biologically (biodegradable) and the application of environmentally friendly waste. The implementation of community-based TPS 3R is not only to encourage changes in the attitudes and mindsets of the community regarding ecologically friendly and sustainable waste management but also to ensure proper management (arrangement) in waste management (Krisnawansyah, 2019).

The third priority strategy is the sixth strategy (improving community knowledge and skills with the presence of extension facilitators from the service or private sector regarding waste management in IKM), with a score of 5.879. Improving community knowledge and skills in waste management is very important, starting from sorting and containerization and then processing recyclable waste or waste that can be made into crafts. Activities to improve community skills and knowledge are related to community empowerment and development in waste management because they can handle waste and environmental cleanliness problems and encourage people to be more active and initiative (Syafruddin et al., 2020)

4. Conclusion

Compost products produced by IKM Rumah Kompos Masaro have an added value of IDR. 563.1 per kgof compost, with a ratio of 47%, which is relatively high. Twelve development strategies that can be implemented to optimize the operations of Rumah Kompos Masaro IKM are formulated using the SWOT method. The highest priority

strategy based on the QSPM method is strategy one, which is carrying out innovative outreach related to waste management to attract community interest and participation. It is hoped that the strategy recommendations produced in this research can be considered by the Masaro Compost House SME and all parties involved in waste management, as well as the need for a more in-depth study using other analytical methods in determining alternative strategic priorities to obtain more comprehensive results.

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