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A SWOT-QSPM-BASED UPSCALING STRATEGY FOR WASTE BANK IN IMPLEMENTING CIRCULAR ECONOMY (CASE STUDY FROM GUNUNGPRING VILLAGE, MAGELANG)

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Abstract

The increasing trend of waste management with circular economy principles, particularly practical guidance in developing waste bank management, has not been supported by sufficient literature. This study aims to formulate a waste bank scaling-up strategy with a case study at the Darlingsih Waste Bank, Gunungpring Village, Magelang Regency. Qualitative research data were collected through interviews with waste bank administrators in the form of internal-external factors and analyzed using the SWOT-QSPM matrix. The analysis results recommend that the most feasible strategy is to market processed products through e-commerce (ST2), obtaining the highest Total Attractiveness Score of 2,970. This strategy focuses on utilizing internal strengths in the form of the waste bank's ability to produce processed waste products and anticipating external threats in the form of uncertainty in the selling price of plastic waste. These findings contribute theoretically by enriching the circular economy literature, specifically on waste banks. Practically, these findings serve as a practical guide for the Darlingsih Waste Bank to scale up its business through an appropriate strategy, namely marketing through e-commerce.

Keywords: circular economic; waste bank; waste management; SWOT; QSPM

INTRODUCTION

One of Indonesia's most urgent challenges is the increasing volume of household waste, which causes serious environmental pollution and threatens both land and marine ecosystems. Driven by population growth and increased consumption, waste generation is projected to reach approximately 35.9 million tons by 2024, with plastics accounting for 19.46 percent (Ridwan, 2025; Purnomo, 2026). Inadequate management, particularly of non-biodegradable plastic waste, exacerbates pollution in soils, rivers, and oceans, underscoring the pressing need for effective solutions. Sustainable Waste Indonesia (SWI) and Indonesian Plastic Recyclers (IPR) report that post-consumer recycling of PET bottles has reached 71 percent, and rigid HDPE has reached 60 percent, with the economic value of the entire recycling chain totaling a staggering IDR 19 trillion per year (Kusuma, 2025). This data demonstrates that waste can represent a tremendous economic opportunity, while also being a burden on the environment.

The data shows that household waste is the largest contributor to total national waste generation, with its contribution increasing from 37.69 percent in 2020 to 53.74 percent in 2024 (Ridwan, 2024). On average, each person in Indonesia produces 0.7 kg of waste per day. With its highly diverse nature—from organic waste to single-use plastic packaging—household waste is the most difficult to manage (Purnomo, 2025). This is exacerbated by low public awareness and habits regarding independent waste management (Martatina, 2026). The rate of plastic waste recycling in

Indonesia is relatively low, only around 22 percent of the total 5.5 million tons per year, further emphasizing that the conventional approach—relying on a "collect-transport-dump" system—has proven inadequate to address this crisis (Ramadhan & Sulistiyandari, 2026; Bappenas, 2025).

This situation urgently requires a literature guide to serve as a reference for waste management and support the implementation of a sustainable circular economy. One of the principles of the circular economy in waste management is to transform waste into high-value products, rather than simply viewing it as a problem to be eliminated (Gutiérrez & Palos, 2023). The Indonesian government has developed a National Circular Economy Roadmap for 2025–2045 with quite ambitious targets, targeting a circular economy contribution to GDP of IDR 638 trillion and the creation of 4.4 million new jobs by 2030 (Ridwan, 2024). This policy is implemented through various community-based approaches, one of the most strategic being the establishment of household-level waste banks.

Waste banks operate through a community-based waste management system that collects, records, processes waste, and sells it for economic value (Achmad & Lusi, 2023). The sociopreneurship business model (such as the Surakarta Waste Bank) demonstrates that waste bank programs can be an alternative solution for household waste management that implements the 3R principle (reduce, reuse, recycle) while simultaneously bringing about social change in community behavior, increased income, and contributions to sustainable development in economic, social, and environmental aspects (Septiani et al., 2024). A study by Ma'ruf et al. (2025) on the Bintang Mangrove Waste Bank (BSBM) in Surabaya found that CSR-supported waste banks improved circular-economy outcomes by diverting waste from landfills and creating economic value for households through changes in waste-management behavior. A study by Sarwoprasodjo et al. (2026) revealed that sustainable waste management is not merely a technical issue but also requires a communicative and institutional process that integrates 3R waste-processing facilities with agro-maritime livelihoods, for example, by converting organic waste into compost and cultivating BSF maggots. In other words, circular economic practices in waste management are not sufficient to stop at the macro policy level, but must also be implemented at the community and household levels.

However, despite the enormous potential of waste banks as leading actors in the circular economy for household waste management, most established waste banks in Indonesia still operate on a microscale and face various challenges with financial sustainability and operational scalability. Research by Yuliastuti et al. (2025) on 12 Waste Bank Social Enterprises (WBSEs) across various Indonesian cities reveals a worrying situation, with most waste banks remaining stagnant and relying on traditional business models. The majority of them simply serve as waste collection points without further processing to generate economic added value. The study also found that the success of waste banks in remaining sustainable lies in strategic transformation through value-added waste processing and the establishment of larger industrial contracts. A report by the Ministry of Environment (2025) shows that most waste banks are born out of environmental concerns but, without a well-established strategy, face difficulties amid uncertainty in the recycling market, minimal support from the surrounding community, and limited technical support. This indicates that the success of a waste bank is not solely measured by its ability to reduce environmental problems; it must also be able to convert waste into processed products with sustainable sales.

Theoretically, the literature to date remains unclear on community-based waste management, particularly regarding the development and upscaling of waste banks. Previous studies have focused only on operational technical aspects, drivers of community participation, or the impact of short-term training. None has provided a holistic strategic paradigm to assist waste banks in their evolution from localized production units into more than just socio-entrepreneurial business entities that can be revitalized in a much larger, more competitive market. Yuliastuti et al. (2025) suggest that the successful development (scaling) of waste banks depends heavily on shifting the business model from passive collectors to active producers. However, this research has not yet

provided concrete, situation-specific strategic recommendations for waste banks based on specific characteristics. This study seeks to provide a theoretical foundation for the future development of waste banks, specifically in the context of the Darlingsih Waste Bank in Gunungpring Village, Muntilan District, Magelang Regency.

The purpose of this study is to formulate an appropriate upscaling strategy based on the actual conditions faced and the characteristics of the Darlingsih Waste Bank using a SWOT analysis of S (Strengths), W (Weaknesses), O (Opportunities), and T (Threats). This analysis facilitates the mapping of internal and external factors relevant to the organization's specific conditions, resulting in more contextual, measurable, and evidence-based strategic recommendations. This study is expected to contribute to the literature on circular economy-based waste management through community-based enterprises by developing a pragmatic strategic model, complementing existing research (e.g., the collaborative governance model of Septiani et al. & Ma'ruf et al.). This study is also expected to provide concrete recommendations for the managers of the Darlingsih Waste Bank in implementing organizational development strategies and serve as a guide for other waste banks in Indonesia with similar circumstances.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Community Based Circular Economy

The circular economy directly challenges the linear model, which relies on resource extraction, production, use, and disposal. In response to today's ecological crisis, the circular economy offers an alternative to the prevailing "take-use-dispose" system (Hadfield et al., 2025). Defined as a systemic framework, it addresses waste, pollution, and climate change through three central principles (Ellen MacArthur Foundation, 2025): minimizing waste and pollution, extending the use of products and materials, and fostering natural regeneration (Munonye, 2025). Unlike the linear economy, which typically stores waste in landfills, the circular economy operates as a closed system, treating waste as a reusable resource (Munenyo, 2025). This model replaces the traditional end-of-life approach to household waste with the 3R strategy: Reduce, Reuse, Recycle.

Although the circular economy concept was initially proposed for large-scale industries, its practices can be scaled down to a community level through community-based circular economy models. In Indonesia, the implementation of the circular economy concept is dominated by micro- and meso-level actors, as manifested in household-based waste banks or *bank sampah* (Susamto et al., 2025). Waste banks serve as hubs for collecting household waste to generate further economic value. Reprocessing can be as simple as sorting waste by type and selling it to collectors, or, at a more advanced level, processing the collected waste into value-added recycled products (Abdillah et al., 2024). These institutions represent a concrete implementation of the circular economy because their business activities involve managing waste according to the 3R principles while simultaneously serving as educational tools and promoters of behavioral change in waste management, ultimately benefiting the community's income (Budiharjo et al., 2025; Septiyani et al., 2024). Warsiyah et al. (2025) found that the existence of waste banks significantly supports local economic sustainability. However, recent studies highlight the circular economy as too technocentric and rooted in a Western perspective that overlooks circular practices already present in informal and grassroots communities, such as in Indonesia (Saefullah et al., 2026; Pambudi et al., 2026).

SWOT-QSPM Matrix

RESEARCH METHODS

This research is designed as an exploratory case study, aimed at reviewing the actual conditions of the research object by examining its internal and external factors and then formulating relevant strategic recommendations. The data collected and analyzed will be qualitative data obtained through interviews. Interviews were conducted with the management of the Darlingsih Waste Bank, comprising the Chairperson, Secretary, and several members, who served as key informants. Data collection took place between August 2025 and January 2026.

The data collected included internal information on the organization's strengths and weaknesses during the Darlingsih Waste Bank's inception, as well as external factors, including opportunities and challenges related to its current business activities. Internal factors explored include managerial governance, financial management, supply chain, production management, product marketing, R&D, and management information systems. External factors targeted include economic, social, cultural, demographic, environmental, and technological trends; competition with similar businesses; and regulatory support.

The data was then analyzed using the SWOT (Strengths-Weaknesses-Opportunities-Threats) and QSPM (Quantitative Strategic Planning Matrix) tools. The SWOT matrix generates alternative strategies based on the information collected, while the QSPM matrix quantitatively determines the main strategic recommendations. The expected outcome of this analysis is a primary strategic recommendation to guide Bank Sampah Darlingsih in scaling up its business activities.

RESULTS AND DISCUSSION

Profile of Bank Sampah Darlingsih

The Darlingsih Waste Bank (an abbreviation of Sadar Lingkungan Bersih) is a waste management unit located in Gunungpring Village, Muntilan District, Magelang Regency, Indonesia. This institution is at the household-community level, specifically in the Dusun Karaharjan. Established in 2023, this waste bank has approximately 80 registered customers, with around 50 active customers depositing waste each month. Organizationally, this waste bank has a fairly modern governance structure with a Chairperson, Secretary, and several technical Divisions. In their business practices, they have implemented financial management using digital technology. This waste bank has been able to actively and independently manage household waste. The collected household waste is then sorted into several categories for reprocessing into products such as plastic and paper, and for composting organic waste. They have produced innovative products from plastic waste, including crafted keychains, tissue boxes, chairs, and tables (Figure 1). To support production activities for processing waste into recycled products, this waste bank has equipment such as plastic shredding and melting machines, incinerators, and other technical equipment (Figure 2). These various processed plastic waste products are also branded under the Krajan Plast name.

Figure 1. Processed Products from the Darlingsih Waste Bank

Figure 2. Waste Recycling Production Workshop

Internal-External Factor Analysis

Referring to strategic management literature, the strategy generation process is divided into three stages (Hitt et al., 2016; David et al., 2017). The first stage is the input stage, where information is collected as basic input for the strategy matching and formulation stage. The second stage is the matching stage, which generates effective and feasible alternative strategies by aligning internal and external information obtained from the previous stage. The final stage is the decision stage, where the strategic alternatives generated in the matching stage are objectively evaluated to determine their feasibility for implementation by the organization (David et al., 2017).

In this case study, the first stage involved gathering information through interviews regarding the organization's current situation. Based on interviews with key informant form Bank Sampah Darlingsih, the following data were obtained:

- Strengths:
  1. The waste bank has a permanent secretariat and a production workshop, along with adequate supporting equipment. It supports waste management activities that go beyond collection, sorting, and selling.
  2. The management has been able to process several types of waste into recycled products. Several products (such as keychains, tables, chairs, handicrafts, and eco-enzyme soap) demonstrate that the waste bank has implemented a circular economy.
  3. The waste supply from customers is quite abundant. Each month, the amount of plastic waste, one of the main raw materials for the production of recycled products, reaches approximately 100 kg. This amount is sufficient to produce medium-scale recycled products for the waste bank class.
  4. The waste bank has adequate financial management, utilizing digital applications. Transaction recording still uses simple technology in the form of a Google spreadsheet, which can be updated regularly and accessed in real time by customers.
  5. There is strong support from regional stakeholders and the local government. Support comes from the Village Residents' Association, the Regional Government, and the Regency Environmental Agency through the provision of facilities, community campaigns, and participation in government expos.
- Weaknesses:

  1. The Waste Bank's management team is short of young people. The current management team is dominated by older generations who are less adaptable to innovation, product

creation, and marketing. It also results in the waste sorting and processing process taking longer.
2. The Waste Bank's administrative system and institutional SOPs are not well-organized. It results in poor financial recording of waste collection transactions from customers and profit sharing.
3. The largest economic profit is still generated from the sale of sorted waste. The economic value generated by the Waste Bank from processing waste into innovative products is still minimal.
4. The market has not widely absorbed the innovative products produced. It is due to management's lack of knowledge of product marketing strategies, resulting in low sales volume for processed waste products.
5. Not all management fully understands the concept of a circular economy in waste management. It has resulted in a primary orientation in waste management that largely relies on a collect-sort-sell model.

- Opportunities:
  1. There are not many other waste banks in the Magelang region that can process waste into processed products. It presents an opportunity for the Darlingsih Waste Bank to dominate the regional market for recycled products.
  2. The abundance of waste in the surrounding area is a potential source of business activity. Waste collected from customers can generate economic value, either by simply sorting and selling it to scrap collectors or by reprocessing it into finished products.
  3. Community awareness is increasing in the surrounding community regarding the importance of managing their waste with care to prevent environmental pollution. This situation presents an opportunity for waste banks to accommodate and manage more waste and market their processed products to the public.
  4. Opportunities to collaborate with other stakeholders to expand their business scale. Collaborations can be forged with government stakeholders, higher education institutions, NGOs, and other community groups.

- Threats:
  1. The dominant dependence of transactions on one type of waste (plastic) with its unstable price creates uncertainty about the economic value obtained. This unstable commodity price creates uncertainty for customers about the economic value they will receive, thus discouraging them from saving their waste.
  2. Public awareness and participation in waste management are still low. It has the potential to lead to an unstable supply of customer waste.
  3. Lack of interest from the younger generation in participating in waste management through waste banks. If waste bank administrators do not address this, the regeneration process will be hampered and the waste bank's sustainability jeopardized.

Strategi Generation

The next stage is to generate strategic initiatives by matching the previously obtained input information. The analytical tool used in this study is the SWOT matrix. In the SWOT matrix, the generated strategies are grouped into four categories: SO (Strengths-Opportunities), WO (Weaknesses-Opportunities), ST (Strengths-Threats), and WT (Weaknesses-Threats) (David et al., 2017). SO strategies seek to maximize strengths and exploit opportunities, while WO strategies seek to exploit opportunities to overcome weaknesses. ST strategies aim to use strengths to minimize threats, while WT strategies aim to manage weaknesses and minimize threats. Of the four strategies, the most recommended strategy is the one that is most urgent and feasible for the organization to implement (David et al., 2017; Hitt et al., 2017). The following are the results of

generating strategies that are in accordance with information from the Darlingsih Waste Bank (Table 1).

Table 1. SWOT Analysis and Generated Strategy

	Opportunities:	**Threats:**
	1. Minimal competition from waste processing units in Magelang. (O1) 2. Overflowing waste potential from surrounding areas. (O2) 3. Public awareness of waste management is increasing. (O3) 4. Opportunities for multi-stakeholder collaboration. (O4)	1. Dependence on unstable plastic prices. (T1) 2. Public participation remains low. (T2) 3. Minimal interest among the younger generation to join in management team. (T3)
Strengths: 1. Having a permanent secretariat and adequate production workshops. (S1) 2. Ability to process waste into products. (S2) 3. A plentiful supply of raw materials. (S3) 4. Financial management is quite organized and sophisticated. (S3) 5. Strong support from the local government. (S4)	SO1: Establish formal partnerships with the Environmental Agency and universities (S5, O3, O4) SO2: Expand the range of value-added processed products (S3, O1, O2)	ST1: Strengthen the range of processed products (T1, S2) ST2: Market recycled products through e-commerce (S2, S3, T1)
Weakness: 1. The older generation dominates the management team. (W1) 2. Administration and standard operating procedures (SOPs) are disorganized. (W2) 3. The majority of profits come from raw waste. (W4) 4. There is minimal knowledge of marketing strategies. 5. Understanding of the circular economy remains low. (W5)	WO1: Open campus-based internship/volunteer programs (W1, O4) WO2: Focus on developing superior products (W3, O1, O2) WO3: Participate in digital marketing training from the Cooperative/MSME Agency or universities (W4, O4) WO4: Workshops and study visits to successful waste banks (W5, O4)	WT1: Establish a management regeneration system (W1, T3) WT2: Conduct ongoing internal education about circular economy (W5, T3)

Strategy Evaluation and Recommendation

Based on the results of generating alternative strategies using the SWOT matrix, various strategic recommendations are available. However, in accordance with the principles of strategic management, an organization is only advised to choose one strategy to implement. This is due to

the organization's limited resources and capabilities to implement two or more strategies simultaneously, which will reduce focus on strategy implementation (David et al., 2016). Therefore, the next stage is to determine several feasible and urgent strategic alternatives to implement at this time. The strategies that are considered to meet these criteria are: 1) Expand the range of value-added processed products (SO1); 2) Market recycled products through e-commerce (ST2); 3) Focus on developing superior products (WO2). To determine which strategy is most feasible, a quantitative evaluation is conducted using the QSPM matrix as follows (Table 2).

Table 2. QSPM Matrix

		Alternative Strategy					
		Expand the range of value-added processed products (SO1)		Market recycled products through e-commerce (ST2)		Focus on developing superior products (WO2).	
Key factors	**Weights**	**AS**	**TAS**	**AS**	**TAS**	**AS**	**TAS**
Strenghts							
Having a permanent secretariat and adequate production workshops.	0.055	4	0.220	2	0.110	3	0.165
Ability to process waste into products.	0.065	3	0.195	2	0.130	4	0.260
A plentiful supply of raw materials.	0.055	4	0.220	1	0.055	3	0.165
Financial management is quite organized and sophisticated.	0.045	2	0.090	4	0.180	1	0.045
Strong support from the local government.	0.080	3	0.240	4	0.320	2	0.160
Weakness							
The older generation dominates the management team.	0.065	2	0.130	4	0.260	3	0.195
Administration and standard operating procedures (SOPs) are disorganized.	0.040	1	0.040	4	0.160	2	0.080
The majority of profits come from raw waste.	0.035	4	0.140	1	0.035	3	0.105
There is minimal knowledge of marketing strategies.	0.090	2	0.180	4	0.360	3	0.270
Understanding of the circular economy remains low.	0.070	3	0.210	2	0.140	4	0.280
Total	**1.000**						

Opportunities							
Minimal competition from waste processing units in Magelang.	0.040	4	0.160	2	0.080	3	0.120
Overflowing waste potential from surrounding areas.	0.030	3	0.090	1	0.030	4	0.120
Public awareness of waste managemennt is increasing.	0.055	2	0.110	4	0.220	3	0.165
Opportunities for multi-stakeholder collaboration.	0.060	3	0.180	4	0.240	2	0.120
Threats							
Dependence on unstable plastic prices.	0.050	4	0.200	1	0.050	3	0.150
Public participation remains low.	0.095	2	0.190	4	0.380	3	0.285
Minimal interest among the younger generation to join in management team.	0.070	1	0.070	3	0.210	4	0.280
Total	**1.000**		**2.665**		**2.970**		**2.965**

Strategy Recommendation

The SWOT and QSPM analyses revealed a recommendation for a priority strategy (with the highest Total Attractiveness Score of 2.970) to increase the business activities of the Darlingsih Waste Bank: marketing recycled products through e-commerce (ST2). This finding is relevant to their internal situation, with a primary weakness being a lack of knowledge of marketing strategies, despite their ability to produce recycled waste products. This also addresses the threat of uncertain resale prices for plastic waste by transforming it into economically valuable products that are not dependent on volatile raw material prices. The Darlingsih Waste Bank must move beyond traditional marketing models that rely solely on sales to the surrounding community. Instead, expand the marketing of processed waste products through digital marketing techniques by the use of digital platforms such as Shopee, Tokopedia, and other marketplaces. The use of social media and e-commerce platforms in product marketing significantly contributes to boosting brand awareness, sales, and customer loyalty for MSMEs in Indonesia (Rachmiani et al., 2025). This further reinforces the message that digital marketing is a necessity for MSMEs, including waste banks, to expand their market reach, something that is difficult to negotiate in today's digital economy.

Expanding marketing through e-commerce is the most concrete and feasible strategy for the Darlingsih Waste Bank. While previously, processed waste products (such as key chains, tables, chairs, and handicrafts) were only known within the local community due to direct promotion by their managers, with the help of e-commerce, they can better introduce their products to consumers across time and space. Various studies support the implementation of this strategy, with empirical evidence demonstrating that e-commerce plays a significant role in marketing efficiency and sales growth for MSMEs, including waste banks (Hidayat et al., 2026). Specifically, this strategy recommendation is reinforced by the findings of Sari et al. (2025), who provided assistance to the Warisan Alam Waste Bank in Bandung, where digital marketing helped the waste bank overcome its marketing challenges.

However, in practice, this strategy must accommodate the identified challenges. The first challenge that should be anticipated is the low level of public participation from the community regarding waste management based on a circular economy. Through a digital marketing strategy, the Darlingsih Waste Bank will not only focus on increasing sales of processed waste products but can also conduct campaigns through social media to raise public awareness in supporting the waste management initiative it has initiated. Second, the challenge is the lack of interest from young people around the waste bank location in joining the waste bank management team. This challenge can also be addressed with a digital marketing strategy that focuses not only on profit but also on creative efforts to attract young people to join as digital volunteers or social media management partners. An example of good practice that has been implemented at the Warisan Alam Waste Bank is encouraging collaboration between waste bank managers and youth groups in utilizing social media. This strategy also needs to be strengthened with regular digital marketing mentoring and training programs, in collaboration with universities and relevant agencies. The implementation of this strategy is expected to significantly increase the scale of the Darlingsih Waste Bank's business and strengthen its position as a circular economy-based waste management business unit in Magelang.

CONCLUSION

After systematically analyzing specific data obtained from the Darlingsih Waste Bank using the SWOT matrix and QSPM, we concluded that the recommended priority strategy is marketing recycled products through e-commerce (ST2). This digital marketing technique could be the most effective way for the Darlingsih Waste Bank to scale up its business. This strategy was chosen because it best capitalizes on the waste bank's core strengths: its ability to process waste into recycled products and its abundant raw materials for production, while also addressing the relevant challenge of dependence on the resale price of plastic waste. These results indicate the urgency of digital transformation in marketing, a necessity for business units, including waste banks, that want to remain viable in today's market dynamics.

This research has several implications. Theoretically, this study enriches the literature on the circular economy, particularly in waste bank management. It also provides guidance on strategies for scaling up waste bank businesses, based on real-life cases, which have previously been primarily studied in conventional MSMEs. Practically, these findings provide concrete guidance for the management of the Darlingsih Waste Bank in its efforts to scale up its circular economy-based business by focusing on developing its digital marketing capacity. This can be achieved through social media management training, creative marketing content creation, marketplace account creation, and online product catalog development.

We acknowledge several limitations of this research. First, there was a significant degree of subjectivity in the SWOT and QSPM analysis process between the waste bank administrators and the researchers. The weighting and attractiveness determination of each assessed factor depended heavily on the researcher's perspective, with little consideration from the administrators. Second, the research was limited to a single waste bank in a single location. This means the findings cannot be fully generalized to other waste banks with different characteristics. Third, the strategies recommended in the research have not been directly tested and measured, so the long-term effectiveness of e-commerce marketing strategies remains unknown.

Based on these limitations, several suggestions for future research are available. First, these findings need to be followed up with action research to implement the recommended e-commerce marketing strategies in real-world settings over several periods. Through this study, the effectiveness of the strategies can be measured quantitatively by measuring the impact of

increased sales volume, market reach, and waste bank revenue. Second, it is necessary to conduct comparative studies between waste banks in different areas (rural vs. urban, tourist vs. non-tourist areas) to strengthen the generalizability of the results of this study.

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