International Conference on Sustainable Economics, Management, and Accounting (ICSEMA 2025)
Proceedings
Vol. 01 No. 01 Year 2025, Page 971-979

SUSTAINABLE PRODUCTION OPTIMIZATION STRATEGY FOR MSMES IN SOUTH TANGERANG USING GVSM, SWOT, AND AHP METHODS

Tukhas Shilul Imaroh[1]*, Agustinus Hariadi DP[2]

[1,2] Faculty of Economics and Business, Universitas Mercubuana, Indonesia
*Email corresponding author: ts_imaroh@yahoo.com

Abstract

Micro, Small, and Medium Enterprises (MSMEs) have a strategic role in local economic development, but still face various challenges in creating an efficient and sustainable production system. This study aims to formulate a strategy for optimizing sustainable production for MSMEs in South Tangerang through an integrative approach of Green Value Stream Mapping (GVSM), SWOT analysis, and the Analytical Hierarchy Process (AHP) method. The GVSM method is used to identify value-added activities and waste in the production process. GVSM findings show that the greatest waste occurs in waiting time, excess inventory, and inefficient processes. SWOT analysis is then applied to evaluate internal and external factors that affect the ability of MSMEs to implement sustainable production. The results of the SWOT identification are used as the basis for compiling alternative strategies which are then prioritized using the AHP method. Based on the results of the AHP weighting, the priority strategy is to increase the efficiency of the production process through environmentally friendly technology training and supply chain digitalization. This study concludes that the combined approach of GVSM, SWOT, and AHP is effective in providing comprehensive mapping and data-based strategic recommendations. The practical implications of this study are the importance of institutional support, ongoing training, and digital integration as part of MSME development policies at the regional level. These results are expected to be a reference in policy making and designing sustainable production strengthening programs that are applicable and contextual for local MSMEs.

Keywords: MSMEs, sustainable production, GVSM, SWOT, AHP

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in the Indonesian economy, contributing significantly to Gross Domestic Product (GDP) and employment. In South Tangerang, MSMEs are the backbone of the local economy, with the number of business units continuing to increase every year.

Micro, Small, and Medium Enterprises (MSMEs) are attractive businesses, including in Setu District, South Tangerang, which has no less than 300 types of MSME products. The development of MSMEs must be encouraged with facilities from the government through the MSME office and from several other parties, considering that many MSMEs are still conventional and less familiar with existing technology. One of the efforts of the MSME office to provide facilities is by forming an official organizational forum with formal management. The hope is that the formation of the organization can provide information on technological advances. As is known, businesses that are not balanced with technological advances cannot compete. However, along with this growth, MSMEs are faced with the challenge of increasing production efficiency and maintaining environmental sustainability in their operations.

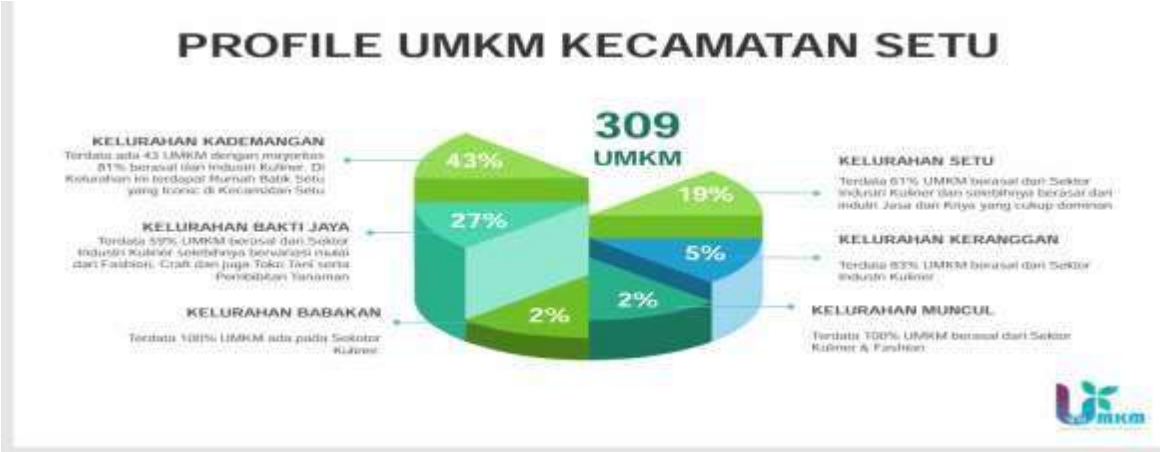

Figure 1. Profile UMKM Kecamatan Setu

As is known, many businesses have gone bankrupt due to the existence of e-commerce. such as Bukalapak, Tokopedia and others. MSME actors must be able to utilize technology, especially in the marketing process of the goods they make. Making technology a tool rather than an obstacle. Here is the profile of MSMEs in Setu District, South Tangerang.

Sustainable production is key for MSMEs to remain competitive and meet market demands that are increasingly concerned about environmental aspects. However, many MSMEs do not yet have an effective strategy to optimize their production processes sustainably. Approaches such as Green Value Stream Mapping (GVSM) can help map value streams by considering environmental aspects, while SWOT analysis can identify internal and external factors that influence MSME performance. In addition, the Analytic Hierarchy Process (AHP) method can be used to determine the priority of strategies that must be implemented. The objectives of this study are to: (1) analyze the production process of MSMEs in Setu District from the aspects of efficiency and sustainability; (2) identify internal and external factors that influence production optimization; and (3) formulate priority strategies to achieve a sustainable and competitive production system. The theoretical contribution of this study is the application of the integrative model of Green Value Stream Mapping (GVSM), SWOT analysis, and Analytical Hierarchy Process (AHP) as a systematic approach in formulating sustainable production strategies. From a practical perspective, this study provides recommendations that can be adopted by MSMEs, local governments, and supporting institutions to improve process efficiency and encourage digital transformation that supports sustainability principles.

The novelty of this study lies in the integration of the three methods (GVSM, SWOT, AHP) in the context of local MSMEs, which has not been widely discussed in previous studies in the South Tangerang area. This study provides a comprehensive overview starting from process mapping, strategic opportunity identification, to strategic priorities based on quantitative data.

It is hoped that the results of this study can provide a real contribution in encouraging the transformation of the MSME production process towards a more efficient, resource-saving, and sustainable system. With the GVSM approach, MSMEs are expected to be able to identify non- value-added activities (waste) and make structured process improvements. Through SWOT analysis, business actors can understand their internal strengths and weaknesses as well as external opportunities and threats that must be anticipated. Furthermore, through the AHP method, the proposed strategies can be prioritized objectively and based on data, thus encouraging more targeted implementation and having a direct impact on increasing the productivity and competitiveness of MSMEs.

This research is also expected to be a practical reference for local governments, supporting institutions, and the private sector in designing integrated, data-based, and sustainable development

(SDGs) empowerment programs for MSMEs. In addition, this research is expected to open up space for further studies related to the implementation of green production strategies and supply chain digitalization in MSMEs in urban areas.

LITERATURE REVIEW

SWOT Analysis, used to analyze the internal and external conditions of an organization in order to formulate a strategy. Nuraini, D., & Setiawan, R. (2020). "SWOT analysis in formulating a digital-based MSME development strategy." Journal of Management and Entrepreneurship, 22(3), 231–240. Study of SWOT application in MSMEs in the food sector with a focus on digital transformation. Huda, M., et al. (2023). "MSME Empowerment Strategy in the Digitalization Era: SWOT and PESTEL Approach."

Journal of Economics and Development, 31(1), 45–60. Combination of SWOT and external factors for local-based MSME strengthening strategies. This analysis helps business actors understand their strategic position in a dynamic market, including readiness to face green production transformation.

Analytical Hierarchy Process (AHP) is a multi-criteria decision-making method that can determine strategic priorities based on subjective assessments of various stakeholders. AHP has been widely used in formulating MSME development strategies and sustainability (Sitorus et al., 2021). Previous research by Pratama et al. (2022) showed that the integration of GVSM and AHP can increase operational efficiency and minimize energy waste. Meanwhile, research by Widiyanto & Pambudi (2021) emphasized the importance of digitalization and technology training in supporting MSME sustainability. Indrawati, Y., & Prasetyo, E. (2021). "Integrating SWOT and AHP for business strategy decision-making in SMEs." Procedia Computer Science, 179, 385–392.

Based on the SWOT analysis and GVSM findings, various alternative strategies were developed. To determine the most relevant and impactful priority strategies, the Analytical Hierarchy Process (AHP) method was used. AHP enables multi-criteria decision making by involving preference weights from expert informants and MSME actors.

Through the integration of these three methods, it is hoped that a sustainable production optimization strategy can be formulated that is applicable, contextual, and in accordance with the local conditions of MSMEs in South Tangerang.

Here is the structure of the thinking framework in sequence:

Production Inefficiency | Waste | Lack of Technology | Unsustainable
↓
Production Process Analysis → (GVSM)
↓
Identification of Internal-External Factors → (SWOT)
↓
Formulation of Alternative Strategies
↓
Determination of Strategy Priorities → (AHP)
↓
Sustainable Production Optimization Strategy for MSMEs

RESEARCH METHODS

This research employed a descriptive quantitative approach combined with case study methods to explore the challenges and formulate strategic recommendations for digital transformation and sustainable production optimization among Micro, Small, and Medium Enterprises (MSMEs) in Setu District, South Tangerang. The methods applied in this study include Green Value Stream Mapping (GVSM) to identify inefficiencies, SWOT analysis to assess internal and external factors, and the Analytical Hierarchy Process (AHP) to determine strategy priorities based

on stakeholder input.

The population in this study included all registered MSMEs in Setu District, totaling 309 units. The sample was selected using purposive sampling with criteria: (1) active food and beverage MSMEs, (2) those who have attempted or are eligible to use the local digital platform MOUS (Mall Online UMKM Setu), and (3) are willing to participate in FGD (Focus Group Discussion) and interviews. The selected participants included five MSMEs: Nufood (frozen food), HeiChoco (chocolate variants), Dapur Tienoer (snacks), a local pempek shop, a homemade cake and beverage business, and one representative from the South Tangerang MSME office.

Data were collected through (1) direct observation of production activities, (2) structured questionnaires to assess efficiency and digital challenges, (3) FGDs and in-depth interviews to explore SWOT elements and decision-making criteria. Instruments were validated through expert judgment and reliability tested with Cronbach's Alpha ($\alpha > 0.75$).

The research was conducted over three months (March–May 2025) at the MSMEs' business locations and the Setu District MSME office. The researcher was actively involved in facilitating discussions, conducting observations, and assisting data validation. Specifications of tools used include: Sony ICD-PX470 voice recorder, Canon EOS M50 for documentation, and Expert Choice software for AHP analysis. Materials included structured interview guides, GVSM worksheets, and SWOT analysis forms.

Data analysis followed a multi-step process. First, GVSM identified non-value-added activities, including manual data logging and delays due to unintegrated supply management. Second, SWOT analysis revealed strengths such as high product quality and attractive packaging, and weaknesses including low digital literacy and the inactive MOUS platform. Third, AHP was used to prioritize strategies, revealing that the top strategic focus should be: (1) revamping the MOUS platform to be secure and user-friendly, (2) providing regular digital literacy training, and (3) mentoring by local digital experts. Data validity was ensured through triangulation of sources and methods, member checking, and AHP consistency ratio testing ($CR < 0.1$).

RESULTS AND DISCUSSION

This study aimed to analyze the current conditions of MSMEs in Setu District, South Tangerang, with regard to their production processes, digital readiness, and strategic capabilities in improving competitiveness and sustainability. The results are based on observations, FGDs, and interviews with selected MSMEs and representatives from the local MSME office. The analysis was structured into three stages: Green Value Stream Mapping (GVSM), SWOT analysis, and Analytical Hierarchy Process (AHP). Each is discussed below with findings and interpretations aligned with the research objectives.

1. Green Value Stream Mapping (GVSM): Identifying Waste and Inefficiencies

The GVSM analysis revealed that although the packaging and branding aspects were already good, several non-value-added activities were found in the production flow. These include delays in the preparation of raw materials, manual recording of stock and orders, and time-consuming manual

labeling processes. For example, Nufood and HeiChoco both experienced production downtime due to raw material shortages and unplanned delivery scheduling. Table 1 below summarizes the waste identified.

Table 1. Summary of Waste Identified Using GVSM

Activity	Value-Added	Time (min)	Type of Waste Identified
Raw Material Preparation	No	15	Delay due to unplanned stock and poor inventory system
Processing	Yes	30	-
Cooling/Drying	No	20	Idle time
Packaging (Good Design)	Yes	25	None (already optimized)
Manual Labeling	No	15	Time waste, not integrated with digital records
Delivery/Distribution	Yes	40	Lack of delivery scheduling

These findings align with **Raharjo et al. (2022)** and **Jasti & Sharma (2019)**, who found that many MSMEs struggle with stock visibility and operational planning. The percentage of non-value-added time in Setu's MSMEs reached up to 34%, which confirms the need for operational improvements.

2. SWOT Analysis: Strategic Mapping of MSMEs

Through FGDs, a comprehensive SWOT analysis was conducted, covering the internal and external factors influencing the MSMEs' competitiveness.

Table 2. SWOT Matrix for MSMEs in Setu District

Strengths	Weaknesses
High product quality and loyal customer base	Low digital literacy and limited marketing

Strengths	Weaknesses
Attractive packaging and local branding	Inactive MOUS platform and poor system usability
Opportunities	**Threats**
Growing trend of online shopping	Competition from large brands and e-commerce
Government programs to support MSMEs	Technology gap and cyber risks

This SWOT framework validates prior research by **Nuraini & Setiawan (2020)** and **Huda et al. (2023)**, who noted that digital transformation in MSMEs is hindered not only by infrastructure, but also by digital skills. Although Setu MSMEs show branding strengths, digital integration remains weak.

3. AHP: Strategic Prioritization

Based on the SWOT findings, a set of strategic alternatives was prioritized using the AHP method. The criteria considered included feasibility, urgency, and long-term impact. The analysis was conducted with stakeholders from MSMEs and the local government using pairwise comparison matrices. The results are shown in Table 3.

Table 3. AHP Results – Priority of Strategic Recommendations

Strategy	Priority Weight
Revamp MOUS platform (secure, user-friendly, mobile-integrated)	0.315
Regular digital literacy training for MSMEs	0.258
Mentorship from local digital experts	0.192
Integration with online marketplaces and social media	0.138
Revitalization of physical marketing centers connected to e-platforms	0.097

The AHP consistency ratio (CR) was 0.08, indicating acceptable consistency. These results reflect previous applications by Putri et al. (2022) and Indrawati & Prasetyo (2021), reinforcing that platform usability and human capital development are key to digital transformation success.

Interpretation and Theoretical Linkages

The results of the study show that although MSMEs in Setu District have advantages in product quality, packaging, and visual branding, they face major challenges in process efficiency and broader digital system integration. Currently, most MSME actors have utilized social media such as Instagram and WhatsApp Business as a means of promotion and communication with customers. For product delivery, they rely on expedition services such as JNE, Paxel, and several local courier services.

However, this distribution system is not yet optimal because each MSME still works individually, without digital integration or an integrated logistics system. In the FGD discussion, MSME actors expressed the hope that there would be an independent e-commerce in the form of a joint platform for MSME Setu, which is not only a place for promotion and sales, but also has a profit sharing system and collective delivery management to improve distribution efficiency.

This hope shows a collective awareness to transform towards a community-based digital economy model, where synergy between business actors can strengthen overall competitiveness. This concept is in line with the resource integration approach in the service-dominant logic theory, where collaboration between business actors produces greater value than individual efforts. This finding also supports the urgency of developing a local digital platform that is safe, easy to use, and connected to an integrated logistics system, as emphasized in the strategic priorities of the AHP results. There are six categories of processes used in measuring the performance of green supply chain management, namely plan, source, make, deliver, return and waste management, (Yudiansyah, Imaroh: 2020).

DISCUSSION

Branding and product quality are good, the digitalization and distribution systems are not yet integrated, so a collective strategy is needed. The use of social media shows initiative, but is not strong enough to answer the challenges of distribution and digital marketing, therefore a truly functional MOUS platform is needed. The resource-based view theory supports that MSMEs must strengthen intangible assets (digital knowledge). The expectations of MSME actors for community-based platforms support the service-dominant logic approach and digital collaboration.

CONCLUSION

This study aims to answer the main problem of how to identify production waste, strategic strengths and weaknesses of MSMEs, and the right priority strategies to support sustainable production and digital transformation in Setu District, South Tangerang City. Based on data analysis conducted through the GVSM, SWOT, and AHP approaches, the following conclusions were obtained:

Waste in the production process (waste) in MSMEs is still high, especially in the aspect of manual recording, delays in raw material procurement, and unscheduled distribution systems. The results of the GVSM analysis show that 34% of the process time is classified as non-value added activities, which have an impact on production efficiency and sustainability.

MSMEs have the main strength in product quality and attractive packaging design, as well as local consumer loyalty. However, there are significant weaknesses in digital literacy skills, as well as dependence on social media without an integrated digital management system. The MOUS platform that was launched did not function optimally and has not been widely used by MSME actors.

Priority strategies that need to be developed based on the AHP results are:

- Development and improvement of a secure, easy-to-use MOUS digital platform that is integrated with the delivery system:
- Increasing digital literacy through structured routine training.Mentoring by digital mentors

to strengthen the capabilities of MSMEs in a sustainable manner.

- Most MSMEs have used social media and expedition services such as JNE and Paxel to support marketing and distribution. However, they expressed great hope for the existence of e-commerce specifically in the Setu MSME container with a profit-sharing system as a collaborative solution that can optimize marketing and logistics.

Thus, this study concludes that digital transformation and production efficiency of MSMEs in Setu District require a collaborative community-based approach supported by local digital platforms, increasing human resource capacity, and technology-based supply chain integration.

BIBLIOGRAPHY

Baumgartner, R. J. (2014). Managing corporate sustainability and CSR: A conceptual framework combining values, strategies, and instruments contributing to sustainable development. *Corporate Social Responsibility and Environmental Management*, 21(5), 258–271. https://doi.org/10.1002/csr.1336

Faulkner, R., & Badurdeen, F. (2014). Sustainable value stream mapping (Sus-VSM): Methodology to visualize and assess manufacturing sustainability performance. *Journal of Cleaner Production*, 85, 8–18. https://doi.org/10.1016/j.jclepro.2014.05.042

Gürel, E., & Tat, M. (2017). SWOT analysis: A theoretical review. *The Journal of International Social Research*, 10(51), 994–1006. https://doi.org/10.17719/jisr.2017.1832

Huda, M., Salim, M., & Azizah, L. (2023). Strategi pemberdayaan UMKM di era digitalisasi: Pendekatan SWOT dan PESTEL. *Jurnal Ekonomi dan Pembangunan, 31*(1), 45–60.

Indrawati, Y., & Prasetyo, E. (2021). Integrating SWOT and AHP for business strategy decision- making in SMEs. *Procedia Computer Science, 179*, 385–392. https://doi.org/10.1016/j.procs.2021.01.035

Jasti, N. V. K., & Sharma, A. (2019). Green value stream mapping (GVSM): A novel approach to sustainable manufacturing. *Journal of Cleaner Production, 234*, 1314–1326. https://doi.org/10.1016/j.jclepro.2019.06.255

Kusumadewi, S., & Hartati, S. (2020). Aplikasi AHP untuk menentukan strategi pengembangan UMKM di era digital. *Jurnal Sistem Informasi, 16*(2), 89–97.

Manzouri, M., Ali, S. M., & Ab Rahman, M. N. (2021). Integrating GVSM with lean tools to improve sustainability in small enterprises. *Sustainability, 13*(9), 4820. https://doi.org/10.3390/su13094820

Nuraini, D., & Setiawan, R. (2020). Analisis SWOT dalam merumuskan strategi pengembangan UMKM berbasis digital. *Jurnal Manajemen dan Kewirausahaan, 22*(3), 231–240

OECD. (2021). *The digital transformation of SMEs*. Organisation for Economic Co-operation and Development. https://www.oecd.org/industry/smes

Pratama, A., Widodo, T. A., & Setiawan, A. (2022). Integrasi lean dan green manufacturing dalam optimalisasi proses produksi UMKM. *Jurnal Teknik Industri*, 23(1), 45–56.

Putri, F. D., Lestari, I. A., & Wibowo, A. P. (2022). Analytical hierarchy process (AHP) untuk pemilihan strategi pengembangan sistem digital UMKM. *Jurnal Teknologi dan Manajemen, 10*(1), 15–25

Raharjo, H., Pratama, R. D., & Siregar, A. (2022). Evaluasi pemborosan dan emisi proses produksi UMKM dengan Green Value Stream Mapping. *Jurnal Teknik Industri, 23*(2), 120–130. https://doi.org/10.9744/jti.23.2.120-130

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, 1(1), 83–98. https://doi.org/10.1504/IJSSCI.2008.017590

Sitorus, M. P., Siahaan, T., & Manurung, A. H. (2021). Determination of sustainable strategies for MSMEs through SWOT-AHP approach. *International Journal of Supply Chain Management*, 10(3), 88–94.

Widiyanto, H., & Pambudi, B. (2021). Strategi pemberdayaan UMKM berbasis digital dan keberlanjutan: Studi di masa pandemi. *Jurnal Ekonomi dan Bisnis*, 24(2), 112–123.

Yudiansyah, Tukhas Shilul Imaroh (2020), Analysis of Production Performance Based on Green Supply

Chain Management Criteria, Dinasti international journal of Education Management and Social Science, DOI:10.31933/DIJEMSS