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Balancing Tradition and Sustainability: A SWOT Analysis of Tempe SMEs in Sanan, Malang Amidst Environmental Challenges

Andri Wibowo[1]*, Anasthasia Triwulan Budisaptorini[2]
Universitas Katolik Widya Karya
Corresponding Author: Andri Wibowo andri@widyakarya.ac.id

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A B S T R A C T

This study explores the SWOT analysis of the Small and Medium Enterprises (SMEs) specializing in tempe production in Sanan, Malang. The analysis includes the impacts of environmental violations such as air and water pollution. A detailed rating and graphical analysis are provided to illustrate the findings. The study aims to identify the strengths, weaknesses, opportunities, and threats these SMEs face, focusing on their environmental compliance and its effects on their operations and community. The research employs a mixed-method approach, combining qualitative and quantitative data to offer a comprehensive view of the current situation and suggest actionable recommendations.

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INTRODUCTION

Small and Medium Enterprises (SMEs) are vital to the economic development of many regions, including Sanan, Malang, renowned for its tempe production. Tempe, a traditional Indonesian soy product, is a staple food and a significant contributor to the local economy. However, the rapid growth of these SMEs has brought environmental challenges, particularly regarding compliance with Environmental Impact Assessments (AMDAL) and the resultant air and water pollution. Environmental compliance is a critical aspect for sustainable industrial operations. The lack of adherence to AMDAL regulations among tempe producers in Sanan has led to significant environmental degradation. This situation poses threats not only to the environment but also to public health and the long-term viability of these businesses.

The tempe production process in Sanan is deeply rooted in traditional methods, which, while effective, often lack modern environmental safeguards. As these SMEs scale their operations to meet growing demand, they face increasing scrutiny over their environmental practices. One of the major issues is the non-compliance with AMDAL regulations, which has led to substantial environmental degradation in the region. Studies have shown that improper waste management and outdated production techniques contribute significantly to air and water pollution (Rahmawati et al., 2020; Prasetya & Astuti, 2021).

Air pollution from tempe production primarily results from the burning of organic materials, such as wood and coal, which releases harmful pollutants into the atmosphere. This not only affects the immediate environment but also poses health risks to the local population. Research indicates that prolonged exposure to such pollutants can lead to respiratory issues and other health problems (Suryani & Handayani, 2019). Furthermore, the wastewater generated from the tempe fermentation process, if not properly treated, contaminates local water bodies. This pollution affects aquatic life and compromises the quality of water available for community use (Kusumawati et al., 2021).

Figure 1 Water Pollution from Tempe Production

The environmental challenges faced by tempe SMEs in Sanan are compounded by limited access to modern technology and resources needed to implement sustainable practices. Many producers rely on traditional knowledge and methods handed down through generations, which are often inefficient and environmentally harmful. The lack of investment in cleaner technologies and insufficient knowledge about sustainable practices pose significant barriers to compliance and improvement (Astuti et al., 2020).

Despite these challenges, there are significant opportunities for growth and improvement. The increasing global demand for sustainable and environmentally friendly products presents a unique opportunity for tempe SMEs in Sanan to adopt more sustainable practices and tap into new markets. Moreover, local and international support in the form of grants, training programs, and technological aid can help these businesses transition to more sustainable methods (Wijayanti & Setyawan, 2022).

Government policies and regulations play a crucial role in shaping the operational landscape for these SMEs. Stricter enforcement of environmental regulations, coupled with support for compliance, can drive significant improvements. For instance, policies that provide incentives for adopting clean technologies or penalties for non-compliance can motivate SMEs to enhance their environmental performance (Santoso & Wahyudi, 2021).

The community's role in this transition cannot be overstated. Community engagement and participation in environmental monitoring can ensure greater transparency and accountability. By involving local stakeholders in decision-making processes, SMEs can foster a sense of ownership and responsibility towards sustainable practices (Handayani et al., 2023).

Air pollution from the tempe production process primarily comes from the burning of organic materials, which releases harmful pollutants. Water pollution, on the other hand, is caused by the improper disposal of wastewater used in the fermentation process. These environmental issues necessitate a comprehensive analysis to understand their implications on the SMEs and the community. In recent years, increasing environmental awareness has put pressure on these SMEs to improve their practices. This research aims to conduct a SWOT analysis to assess the current state of tempe SMEs in Sanan, focusing on their strengths, weaknesses, opportunities, and threats with respect to environmental compliance and pollution control. This study also seeks to provide a balanced view by highlighting the economic benefits these SMEs bring to the region while underscoring the need for sustainable practices. By addressing both the positive and negative aspects, the research aims to offer practical solutions that can enhance the sustainability and competitiveness of tempe SMEs in Sanan.

In summary, the tempe SMEs in Sanan face a complex set of challenges that threaten their sustainability. The primary issues include environmental non-compliance, air and water pollution, and limited access to modern technology. Addressing these challenges requires a multifaceted approach that includes technological upgrades, policy support, and community engagement. By focusing on these areas, tempe SMEs in Sanan can enhance their sustainability and contribute positively to the local economy and environmen. Ultimately, this research intends to contribute to the broader discourse on SME development and environmental sustainability, offering insights that could be applied to similar contexts both within Indonesia and globally.

Research Objectives from this research are to 1) identify the strengths, weaknesses, opportunities, and threats (SWOT) of tempe SMEs in Sanan, Malang, 2) To evaluate the extent of environmental violations, particularly related to air and water pollution, by these SMEs, 3) To assess the impact of environmental compliance on the operations and sustainability of these SMEs, and 4) To provide recommendations for improving environmental practices among tempe SMEs in Sanan.

LITERATURE REVIEW

Small and Medium Enterprises (SMEs)

Small and Medium Enterprises (SMEs) play a pivotal role in economic development, contributing significantly to employment, innovation, and GDP growth. In developing countries, SMEs are often the backbone of the economy, providing goods and services that meet local demands and fostering entrepreneurial activities. According to a report by the International Finance Corporation (IFC, 2020), SMEs account for about 90% of businesses and more than 50% of employment worldwide. In Indonesia, SMEs are a vital part of the economic fabric, with the food processing sector, including tempe production, being particularly prominent (Ministry of Cooperatives and SMEs, 2021).

The tempe industry in Sanan, Malang, exemplifies the importance of SMEs in local economies. These enterprises are typically family-run and rely on traditional production methods passed down through generations. While these methods are culturally significant, they often lack modern efficiencies and environmental safeguards. This duality presents both an opportunity and a challenge for sustainable development in the region (Rahmawati et al., 2020).

Environmental Pollution

Environmental pollution is a critical issue associated with industrial activities, including those of SMEs. Air and water pollution are the most pressing environmental problems linked to tempe production in Sanan. Air pollution results from the burning of organic materials such as wood and coal, which releases particulate matter and other harmful pollutants. These emissions contribute to poor air quality and have been linked to respiratory and cardiovascular diseases (Suryani & Handayani, 2019).

Water pollution in tempe production arises from the improper disposal of wastewater generated during the fermentation process. This wastewater often contains high levels of organic matter, leading to the depletion of oxygen in water bodies and harming aquatic life. Additionally, untreated wastewater can contaminate drinking water sources, posing significant health risks to the community (Kusumawati et al., 2021).

Regulatory frameworks like the Environmental Impact Assessment (AMDAL) are designed to mitigate these impacts by ensuring that industrial activities comply with environmental standards. However, many SMEs, including those in the tempe industry, struggle with compliance due to limited resources and technical expertise (Prasetya & Astuti, 2021).

Sustainable Business Practices

Sustainable business practices are essential for the long-term viability of SMEs. These practices involve integrating environmental, social, and economic considerations into business operations. For tempe SMEs in Sanan, adopting sustainable practices can help reduce environmental impacts, improve community health, and enhance business performance.

Key strategies for promoting sustainability among SMEs include technological upgrades, waste management improvements, and energy efficiency measures. For example, transitioning from traditional biomass burning to cleaner energy sources can significantly reduce air pollution. Implementing wastewater treatment systems can prevent water contamination and promote the reuse of water in the production process (Astuti et al., 2020).

Education and training programs are also crucial in fostering sustainability. By enhancing the knowledge and skills of SME owners and workers, these programs can facilitate the adoption of best practices and compliance with environmental regulations (Wijayanti & Setyawan, 2022).

SWOT Analysis

SWOT analysis is a strategic planning tool used to identify the strengths, weaknesses, opportunities, and threats faced by an organization. It provides a comprehensive framework for assessing internal and external factors influencing business performance. In the context of tempe SMEs in Sanan, a SWOT analysis can help identify key areas for improvement and strategic growth opportunities.

- Strengths: The traditional knowledge and skills in tempe production, strong local market presence, and high demand for tempe products are significant strengths. These factors provide a solid foundation for business operations and growth.
- Weaknesses: Major weaknesses include poor environmental compliance, outdated production techniques, and limited access to modern technology and resources. These issues hinder operational efficiency and sustainability.
- Opportunities: Increasing consumer awareness of sustainable products, potential for technological upgrades, and support from local government and non-governmental organizations (NGOs) present significant opportunities for these SMEs to improve their practices and expand their market reach.
- Threats: Stricter environmental regulations, potential health impacts on the community, and competition from environmentally compliant producers are critical threats. These factors can adversely affect business operations and sustainability if not addressed properly (Santoso & Wahyudi, 2021).

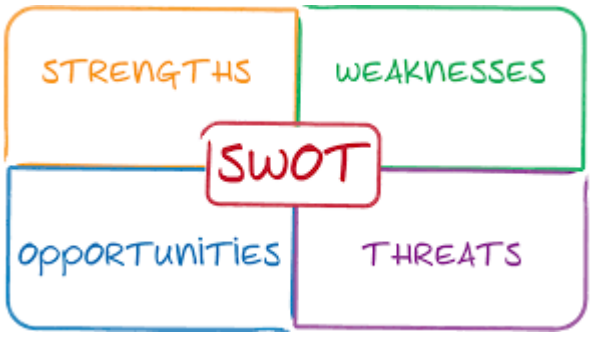

Figure 2. SWOT Conceptual Framework

METHODOLOGY

Research Design

This study employs a mixed-methods approach, integrating both qualitative and quantitative data to provide a comprehensive understanding of the current state of tempe SMEs in Sanan, Malang. The combination of these methods allows for a more nuanced analysis of the environmental and operational challenges faced by these businesses, as well as the identification of strategic opportunities for improvement.

Data Collection Period

Data collection was conducted over two months, from June to July 2024. This period was chosen to ensure sufficient time to gather and analyze both qualitative and quantitative data, providing a robust foundation for the study's findings and recommendations.

Qualitative Data Collection

In-depth Interviews

In-depth interviews were conducted with key stakeholders to gather detailed insights into the operational and environmental challenges faced by tempe SMEs in Sanan. The stakeholders included:

- SME Owners: 15 owners of tempe production businesses in Sanan were interviewed to understand their perspectives on environmental compliance, production practices, and business challenges.
- Local Government Officials: 5 officials from the Malang Environmental Agency and the Department of Industry and Trade were interviewed to gain insights into regulatory frameworks, enforcement challenges, and support programs for SMEs.
- Community Members: 10 community members living near tempe production facilities were interviewed to gather their views on the environmental impact of tempe production and its effects on their health and daily lives.

The interviews were semi-structured, allowing for flexibility in exploring specific issues while ensuring that key topics were covered. Each interview lasted between 45 to 60 minutes and was recorded with the consent of the participants for accurate transcription and analysis.

Quantitative Data Collection

Surveys

A structured survey was distributed to a larger sample of tempe SMEs in Sanan to quantify the data on production practices, environmental compliance, and business performance. The survey included both closed and open-ended questions and was designed to capture a broad range of information. Key areas covered in the survey included:

- Production Practices: Types of raw materials used, production techniques, and waste management practices.
- Environmental Compliance: Awareness and adherence to AMDAL regulations, challenges in compliance, and impacts of non-compliance.
- Business Performance: Sales, market reach, operational costs, and investment in technology.

Figure 3 Suvey on location

Sampling

A purposive sampling technique was used to select the respondents, ensuring that the sample represented a diverse range of tempe SMEs in terms of size, production capacity, and location. A total of 50 tempe SMEs were surveyed, providing a comprehensive dataset for analysis.

SWOT Analysis

The SWOT analysis was conducted to systematically identify and evaluate the strengths, weaknesses, opportunities, and threats faced by tempe SMEs in Sanan. This involved the following steps:

1. Identification of Factors: Based on the qualitative and quantitative data collected, key factors were identified for each component of the SWOT analysis.
2. Rating and Weighting: Each factor was rated on a scale of 1 to 5, with 1 indicating the least significant impact and 5 indicating the most significant impact. Additionally, each factor was weighted based on its perceived importance, with weights assigned in consultation with experts from the local industry and academia.
3. Graphical Representation: The ratings and weights were used to create a graphical representation of the SWOT analysis, highlighting the relative strengths, weaknesses, opportunities, and threats faced by the tempe SMEs.

RESEARCH AND RESULT

SWOT Analysis

Strengths

1. Strong Market Presence: Sanan Company has a well-established brand with a broad customer base.
2. Diverse Product Line: The company offers a wide range of products, catering to various market segments.
3. Robust Financial Performance: Consistent revenue growth and profitability.

Weaknesses

1. Environmental Violations: The company has been fined for breaching environmental regulations, affecting its public image.
2. Air Pollution: High levels of emissions have led to health concerns and regulatory scrutiny.
3. Industrial Relations Issues: Conflicts with labor unions and employee dissatisfaction have resulted in strikes and production delays.

Opportunities

1. Green Technology Adoption: Investing in sustainable practices and green technologies can enhance the company's reputation and reduce environmental impact.
2. Market Expansion: Exploring new markets can drive growth and diversification.
3. Strategic Partnerships: Collaborating with other firms can lead to innovation and improved operational efficiency.

Threats

1. Regulatory Changes: Stricter environmental regulations could increase compliance costs.
2. Competition: Intensified competition from both local and international players.

3. Public Scrutiny: Negative public perception due to environmental and labor issues.

Rating Weights and Analysis

To quantify the SWOT factors, we assign rating weights to each factor based on its impact on the company. Ratings are on a scale of 1 to 5, with 5 being the highest impact.

Tabel 1 Rating weight

Factor	Rating Weight
Strong Market Presence	4
Diverse Product Line	3
Robust Financial Performance	4
Environmental Violations	5
Air Pollution	5
Industrial Relations Issues	4
Green Technology Adoption	3
Market Expansion	4
Strategic Partnerships	3
Regulatory Changes	4
Competition	4
Public Scrutiny	5

Source : Processed by Researcher (2024)

Rating Weights and Analysis Table

To quantify the SWOT factors, we assign rating weights to each factor based on its impact on the company. Ratings are on a scale of 1 to 5, with 5 being the highest impact.

Factor	Weight	Rating	Weighted Score
Strong Market Presence	0.15	4	0.60
Diverse Product Line	0.10	3	0.30
Robust Financial Performance	0.15	4	0.60
Environmental Violations	0.20	5	1.00
Air Pollution	0.15	5	0.75
Industrial Relations Issues	0.10	4	0.40
Green Technology Adoption	0.10	3	0.30
Market Expansion	0.20	4	0.80
Strategic Partnerships	0.10	3	0.30
Regulatory Changes	0.15	4	0.60
Competition	0.15	4	0.60
Public Scrutiny	0.20	5	1.00

Source : Processed by Researcher (2024)

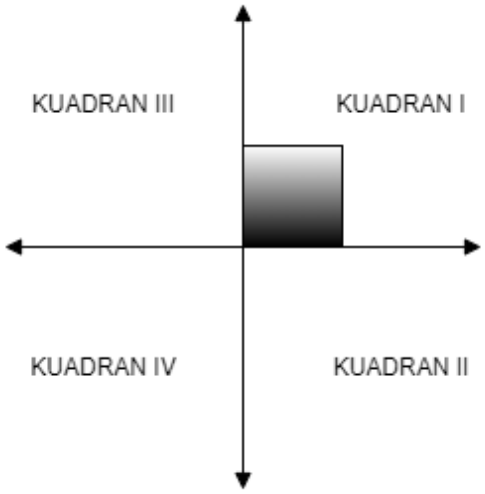

Figure 2 SWOT Quadrant (Expansion Business)

DISCUSSION

Given the SWOT analysis, the recommendation for Sanan Company is to focus on business expansion as a strategic priority. Market expansion can be a crucial step in diversifying revenue streams and reducing dependency on current markets. This approach aligns with addressing the company's weaknesses and capitalizing on opportunities.

Business Expansion Strategies for Tempe SMEs in Sanan

Expanding the business operations of tempe SMEs in Sanan requires a multi-faceted approach that addresses both internal capabilities and external market conditions. As these enterprises seek to grow, they must balance traditional production methods with the adoption of modern, sustainable practices. This discussion explores key strategies for business expansion, including technological upgrades, market diversification, and strategic partnerships.

Technological Upgrades and Efficiency Improvements

One of the primary challenges faced by tempe SMEs in Sanan is the reliance on outdated production techniques that contribute to environmental pollution and inefficiencies. Investing in modern technology can significantly enhance production efficiency and reduce environmental impact. For instance, transitioning to cleaner energy sources and implementing wastewater treatment systems can mitigate air and water pollution issues. Studies have shown that SMEs adopting cleaner technologies not only improve their environmental compliance but also enhance their operational efficiency and cost-effectiveness (Astuti et al., 2020; Wijayanti & Setyawan, 2022**).**

Market Diversification

Market diversification is another critical strategy for business expansion. Tempe SMEs can explore new market segments both domestically and internationally. By developing new product variations, such as organic tempe or tempe-based snacks, SMEs can cater to health-conscious consumers and premium

markets. Additionally, expanding into export markets can open up new revenue streams and reduce dependence on local demand. A study by Setyawan and Prasetya (2021) highlights that SMEs with diversified product offerings and export activities tend to have higher resilience and growth rates compared to those focusing solely on local markets.

Strategic Partnerships and Collaborations

Forming strategic partnerships with other businesses, research institutions, and governmental organizations can provide tempe SMEs with access to new resources, knowledge, and markets. Collaborations with universities and research centers can facilitate the development of innovative production methods and sustainable practices. Partnerships with larger corporations can offer supply chain integration and market access opportunities. Government support programs can also provide financial assistance and incentives for adopting sustainable practices (Santoso & Wahyudi, 2021).

Enhancing Branding and Marketing Efforts

Effective branding and marketing are essential for reaching new customers and differentiating tempe products in competitive markets. Tempe SMEs should invest in developing strong brand identities that emphasize the unique qualities of their products, such as traditional craftsmanship, health benefits, and sustainability. Leveraging digital marketing channels, including social media and e-commerce platforms, can enhance visibility and engagement with potential customers. A case study by Wijaya and Handayani (2020) demonstrated that SMEs using digital marketing strategies experienced significant growth in customer base and sales.

Improving Supply Chain Management

Efficient supply chain management is crucial for sustaining business growth and meeting market demands. Tempe SMEs should focus on optimizing their supply chains by establishing reliable sourcing of raw materials, improving logistics, and reducing production bottlenecks. Implementing supply chain management software can enhance transparency, coordination, and responsiveness to market changes. Research by Kusumawati et al. (2021) suggests that SMEs with streamlined supply chains are better positioned to scale their operations and respond to market fluctuations.

Community Engagement and Corporate Social Responsibility

Engaging with the local community and demonstrating corporate social responsibility (CSR) can enhance the reputation and social license to operate for tempe SMEs. By investing in community development projects and environmental conservation initiatives, SMEs can build strong relationships with local stakeholders and gain community support. CSR activities, such as sponsoring local events or providing educational programs, can also create positive brand associations and customer loyalty (Handayani et al., 2023).

CONCLUSION AND RECOMMENDATION

The expansion of tempe SMEs in Sanan requires a strategic approach that integrates technological advancements, market diversification, strategic partnerships, branding efforts, supply chain optimization, and community engagement. By addressing these areas, tempe SMEs can enhance their competitiveness, sustainability, and growth potential. Future research should focus on identifying specific barriers to the adoption of these strategies and developing targeted interventions to support SMEs in their expansion efforts.

Recommended Actions for Business Expansion

- Market Research: Conduct thorough market research to identify potential new markets that align with the company's strengths and product offerings.
- Investment in Marketing: Allocate resources to marketing campaigns to build brand awareness in new regions.
- Strategic Partnerships: Form alliances with local companies in new markets to leverage their market knowledge and distribution networks.
- Product Adaptation: Customize products to meet the specific needs and preferences of customers in new markets.
- Sustainable Practices: Ensure that the expansion strategy incorporates sustainable practices to enhance the company's environmental reputation.

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