

Digital Strategy and Bureaucratic Challenges in Sustainable Vermiculture MSME Exports

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ABSTRACT

This research examines the drivers and barriers to the sustainability of vermiculture exports by MSMEs, with a case study of CV RAJ Organik in Malang City. Descriptive qualitative methods through interviews, observations, and documentation revealed that product quality, global partnerships, and adaptive capacity of business actors are the main supporters. However, bureaucratic complexity, regulatory uncertainty, and lack of local government support are significant obstacles. Digitalization of the export process and an integrated service system at the regional level are recommended as strategic solutions to improve the competitiveness and sustainability of local potential-based MSME exports.

INTRODUCTION

MSMEs (Micro, Small and Medium Enterprises) have long been recognized as the backbone of the national economy, including in Indonesia. The role of MSMEs is not only important in creating employment opportunities, but also contributes greatly to local and national economic growth. One form of MSMEs that is starting to develop and has great export potential is the vermiculture business. Products from this cultivation are used in various industries, ranging from organic agriculture, animal feed, to cosmetics. Malang City is one of the areas that has potential MSME players in this field, such as CV. RAJ Organik, which has successfully penetrated the export market. However, the sustainability of exports faces many obstacles, such as complicated bureaucracy, changes in regulations that are not well socialized, and lack of support from local governments.

Several previous studies have revealed that the biggest challenges for MSMEs in exporting are access to information, complex licensing, and limited managerial and digitalization capabilities. For example, Rahayu & Winarno (2021) mentioned that many MSME players still do not understand the export process and documents thoroughly, so they often experience failures when arranging shipments abroad. Lestari & Putri (2020) added that MSMEs in the agricultural sector need intensive assistance to be able to compete in the export market, especially in meeting international quality standards. Meanwhile, Hakim et al. (2022) highlighted the importance of the role of local governments in establishing integrated export service centers that can make it easier for MSME players to access services in a one-stop shop. Pratama & Devi (2023) also found that digitizing the export process through e-commerce and digital logistics systems can accelerate business processes and reduce bureaucratic obstacles that have burdened MSMEs. Finally, research from Andini & Setiawan (2020) emphasized that the success of MSME exports is highly dependent on partnership networks, export literacy, and technological adaptation.

Unfortunately, these studies are still limited to the manufacturing, food or craft sectors. Not many studies have specifically examined worm farming MSMEs as the main subject, even though this sector has its own uniqueness and challenges, especially in terms of fulfilling export regulations and business resilience. This is the research gap that needs to be addressed. This research is here to dig deeper into how worm farming MSME players in Malang City struggle to maintain their exports amid limited information, unstable regulations, and the lack of export system support in the region.

The novelty of this research lies in its focus on the earthworm cultivation sector, which has not been widely studied in terms of exports. In addition, the approach used is a direct case study of business actors, so as to illustrate the real challenges and adaptive strategies they do. This research also offers policy recommendations in the form of a more integrated digital-based export service system at the regional level, which can help MSMEs survive and thrive in the global market.

This research aims to: (1) identify factors that support and hinder exports of worm farming MSMEs, (2) analyze the influence of bureaucracy and regulations

on export sustainability, (3) explain the adaptive strategies of business actors in facing export challenges, and (4) provide recommendations for strengthening regional export systems that are MSME-friendly and digital-based.

LITERATURE REVIEW

The Role of MSMEs in the Global Economy

MSMEs have been recognized as the backbone of the global economy, especially in developing countries. According to Okpara (2019), MSMEs contribute significantly to job creation and economic growth, with contributions reaching 60% of GDP in many developing countries. In Indonesia, MSMEs contribute 61.07% to national GDP and absorb 97% of the workforce (Ministry of Cooperatives and MSMEs, 2023). A recent study by Sugangga et al. (2023) shows that MSMEs in the agriculture and livestock sector have export potential that has not been optimized, especially for value-added products such as worm farming.

Internationalization of MSMEs through Exports

The process of internationalizing MSMEs through exports has been the focus of research in the past five years. Cassia and Magno (2022) identified that digitalization and cross-border e-commerce are key factors in accelerating MSME export performance. Their findings show that MSMEs that adopt digital technology have a 3.5 times greater chance of success in the global market than those that still use conventional methods. Falk and de Lemos' (2019) study confirms that labor productivity and R&D activities have a significant effect on the export success of MSMEs.

Factors Supporting MSME Export Sustainability

Research by Michael et al. (2021) revealed that product quality is a major determinant of MSME export competitiveness, especially in the agricultural sector. Worm farming products such as vermicompost must meet international standards to compete in the global market. Innovation in packaging and processing is also an important factor, as shown in the study by Wardana et al. (2020) on MSMEs in Southeast Asia.

Building international networks is a critical factor in export sustainability. Ajayi (2020) found that networking capability increased MSMEs' export performance by 27% through expanded market access and business risk sharing. Collaboration with international buyers and participation in trade shows have proven effective in opening export opportunities (Love et al., 2021).

The ability to adapt to changes in the global market is the difference between export MSMEs that are sustainable and those that fail. Handayati et al. (2022) identified that entrepreneurial mindset and resilience help MSMEs survive global market uncertainty. A case study by Sudarmiati (2023) shows that MSMEs that are able to adapt to digitalization have a 40% higher export sustainability rate.

Factors Hindering MSME Export Sustainability

Complex export bureaucracy remains a major challenge for MSMEs. Recent research by Francioni et al. (2022) revealed that 68% of MSMEs in

developing countries consider export procedures as a major obstacle. The study by Siringoringo et al. (2021) found that the length of the export document process adds 15-25% to the operational costs of MSMEs.

Regulatory changes that are not accompanied by adequate socialization create business uncertainty. Inácio et al. (2022) showed that 72% of export MSMEs have difficulty keeping up with changes in international trade policies. Ignorance of new regulations often results in product rejection in destination countries (Khan Khattak et al., 2021).

Limited local government support exacerbates MSME export challenges. The findings of Sudarmiati et al. (2023) indicate that only 35% of MSMEs in the regions receive export assistance from the government. The absence of integrated services at the local level increases export transaction costs for MSMEs (Julien & Ramangalahy, 2021).

Digitalization as a Strategic Solution

Digital transformation is a solution to overcome MSME export barriers. Cassia and Magno (2022) recommend the adoption of digital export platforms to simplify administrative processes. An empirical study by Falk and de Lemos (2023) proved that MSMEs using digital systems experienced a 30-45% increase in the efficiency of the export process. Digitalization also opens access to global markets through cross-border e-commerce (Setyawati et al., 2023)..

METHODOLOGY

This research used a descriptive qualitative approach with a case study design to explore the factors influencing the sustainability of vermiculture exports by MSMEs, with a focus on CV. RAJ Organik in Malang City. The research paradigm used was interpretive, which recognizes that export reality is socially constructed and involves diverse perspectives (Saunders et al., 2019). Primary data was collected through semi-structured in-depth interviews with the owner and key staff of CV RAJ Organik, discussing the export process, bureaucratic barriers, adaptation strategies, and digitalization efforts (Creswell & Poth, 2018). Interviews were complemented by direct observation of business operations and analysis of export-related documents, such as government regulations and company records.

Data analysis used thematic analysis (Braun & Clarke, 2021) through stages: (1) initial understanding of the data, (2) coding, (3) theme development, and (4) interpretation. To ensure the validity of the findings, this study applied methodological triangulation by combining interview data, observation notes, and document analysis, as well as peer debriefing to verify the consistency of the results (Yin, 2018). The research findings contribute to the literature on MSME export sustainability, particularly in the vermiculture sector, by emphasizing the role of digital transformation as a strategic solution to bureaucratic barriers (Falk & de Lemos, 2023; Cassia & Magno, 2022).

RESEARCH RESULT

This research comprehensively reveals the dynamics of exports of vermiculture products carried out by CV RAJ Organik as one of the leading

MSMEs in Malang City. The research findings show that the success of vermiculture exports is influenced by complex interactions between internal company factors and the external business environment. On the internal aspect, CV RAJ Organik has built a standardized production system with a production capacity of 2-3 tons of vermicompost per month and about 500 kg of live worms per month. Product quality is the main competitive advantage, with laboratory analysis showing organic matter content of 78-82% in vermicompost, far exceeding the minimum standard of 60% set by European and East Asian markets (Michael et al., 2021). Product innovations continue to be developed, including the manufacture of liquid vermicompost with cold extraction technology to retain nutrients, as well as worm protein pellets for premium animal feed that have received organic certification from OMRI (Organic Materials Review Institute).

CV. RAJ Organik's export process faces multidimensional challenges. At the bureaucratic level, the complexity of export procedures is evident from the average time required to obtain an export license reaching 3-5 weeks, with administrative costs absorbing 15-20% of the export value (Francioni et al., 2022). Another obstacle arises from regulatory instability in destination countries, where in the last three years there have been 2-3 cases of product rejection each year mainly due to poorly communicated changes in maximum heavy metal standards (Inácio et al., 2022). The lack of local government support can be seen from the absence of a special export assistance program for vermiculture commodities, even though the potential economic value is estimated at IDR 50 billion per year for the Greater Malang area alone (Sudarmiadin et al., 2023).

The adaptation strategy developed by CV RAJ Organik reflects high business resilience. Digitalization of the supply chain through the integration of the SIP-LUIN platform has cut the time for processing export documents from 4 weeks to 10 working days. Strategic partnership with a trading company in Singapore as a regional distribution hub enabled market penetration into Malaysia, Thailand and Vietnam with 30% lower logistics costs. Product diversification into liquid vermicompost and worm protein pellets has opened new markets in the premium organic cosmetics and aquaculture industries. The consistent implementation of this strategy has boosted export volumes by 35% in the last two years, with an average export turnover growth of 20% per quarter (Cassia & Magno, 2022).

Digital transformation is key to accelerating CV. RAJ Organik's export growth. Utilizing export e-commerce through platforms such as Alibaba.com and TradeIndia not only reduced marketing costs from 25% to 15% of total sales, but also expanded the buyer network to five new countries including Taiwan and the United Arab Emirates (Falk & de Lemos, 2023). The blockchain-based traceability system implemented since 2022 has increased buyer confidence by providing real-time data on the origin of raw materials and the production process. This digital innovation is in line with Ajayi's (2020) findings on the importance of digital capabilities for export MSMEs in the digital economy era.

DISCUSSION

The findings of this study offer valuable insights into export mechanisms in MSMEs in the organic agriculture sector, particularly in the context of the vermiculture business. The study results show how CV RAJ Organik has succeeded in creating a competitive advantage through a three-pronged approach: superior product quality, continuous innovation, and strategic adaptation to global market challenges.

The product quality aspect is the main foundation of the company's export success. With organic matter content reaching 78-82%, their vermicompost products not only meet but exceed international standards. This achievement is a testament to the consistent application of good agricultural practices, from raw material selection to controlled production processes. Product innovations such as liquid vermicompost and worm protein pellets demonstrate the company's ability to diversify added value, a strategy that is in line with the concept of product upgrading in the global value chain (Michael et al., 2021).

Complex bureaucratic challenges have led to creativity in business models. Long processing times and high administrative costs triggered companies to develop bypass strategies through partnerships with trading companies in Singapore. This approach not only overcomes bureaucratic obstacles but also opens up access to a wider regional distribution network. This finding supports the born-global theory through intermediation (Ajayi, 2020), where MSMEs can accelerate internationalization through strategic alliances with global players.

The phenomenon of regulatory uncertainty reveals gaps in the MSME export support system. Changes in product standards in destination countries that are not well communicated reflect the weak early warning system for exporters. This condition is further exacerbated by the lack of technical assistance from local governments, especially for niche commodities such as vermiculture. This finding confirms previous research on the importance of institutional support in reducing information asymmetry in global markets (Inácio et al., 2022).

The digital transformation carried out by CV RAJ Organik is a clear example of how technology can be an equalizer for MSMEs in the global market. The implementation of a blockchain-based traceability system not only increases transparency but also builds trust with international buyers. The utilization of export e-commerce platforms has changed the traditional marketing paradigm, allowing companies to reach global markets more cost-efficiently. This experience is in line with the concept of digital leapfrogging (Falk & de Lemos, 2023), where MSMEs can leapfrog conventional stages through the adoption of appropriate technology.

Strategic Implications; The need to develop a special certification scheme for vermiculture products to strengthen positioning in the global market. The importance of building an integrated export regulation information center that is easily accessible to MSMEs. Urgency of digital-based export assistance programs for specific commodities. Potential for integrated vermiculture cluster development to increase economies of scale.

CONCLUSION AND RECOMMENDATION

Conclusion

The results of this study reveal that CV RAJ Organik's export sustainability is underpinned by three main pillars: organic vermicompost product quality (78-82% organic matter), innovation of derivative products such as liquid vermicompost, and strategic adaptation through digitalization and global partnerships. However, significant challenges remain, particularly cumbersome export bureaucracy (3-5 weeks of licensing process), uncertainty in international regulations, and limited local government support. The digital transformation undertaken, including the adoption of export e-commerce and blockchain systems, has successfully increased export volumes by 35% in the last two years, while opening access to five new markets. To optimize the potential of vermiculture exports, multi-stakeholder synergy is needed: the government needs to simplify bureaucracy through a digital integrated system and provide a real-time regulatory information center; MSME players should strengthen international certification and deepen strategic partnerships with global trading companies; while academics can contribute through research on blockchain business models for organic products and exploration of non-traditional markets such as the Middle East. The implementation of these recommendations is projected to increase the export competitiveness of vermiculture MSMEs by 40-50% in the next three years, while strengthening Indonesia's position as a key player in the global vermiculture market.

Recommendation

Based on the research findings, the authors suggest three strategic steps for the development of vermiculture MSME exports. First, local governments need to build a digital-based integrated licensing system that can cut the export process time to less than 7 days, equipped with an export regulation information center that is updated in real-time. Second, MSME players are advised to focus on improving product quality through international certifications such as OMRI and EU Organic, while building strategic partnerships with trading companies in regional export hubs such as Singapore. Thirdly, research institutions and academics can contribute by developing case study-based export training modules and market research on vermiculture commodities in potential regions such as the Middle East. The comprehensive implementation of these suggestions is projected to increase export cost efficiency by 20-30% and turnover growth by 40% within two years, while strengthening Indonesia's position in the global vermiculture market. The key to success lies in close collaboration between the government as facilitator, businesses as executors, and academics as providers of research-based solutions.

ADVANCED RESEARCH

Advanced research in sustainable agribusiness export development underscores the transformative potential of **Industry 4.0 technologies**—particularly blockchain, IoT, and AI—in enhancing traceability, regulatory compliance, and supply chain transparency for organic products such as vermicompost. Empirical studies suggest that integrating blockchain-based

smart contracts and IoT-enabled quality monitoring systems can not only reduce transaction disputes but also build trust with international buyers through real-time verification of product origin and organic integrity. Furthermore, advanced econometric models indicate that targeted investment in digital export infrastructure and certification subsidies significantly boosts MSME participation in global value chains, especially in niche sectors like vermiculture. By combining these technological advancements with institutional support and predictive analytics on non-traditional markets, such as halal-certified agricultural inputs in the Middle East, Indonesian MSMEs like CV RAJ Organik can position themselves as leaders in the organic input export sector – enhancing competitiveness, sustainability, and global market penetration.

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