

Resilience of Poultry SMEs: Sustainable Innovation for Environmental Management in Jakarta: A Literature Review

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Abstract: This study analyzes the development of the topic of SME resilience and sustainable innovation published between 2021 and 2024. Based on an analysis of 92 registered documents, it was found that the number of publications each year has grown by 27.23% annually, reflecting rapid development in this field. The majority of the publications are scholarly articles with an average document age of 1.38 years, indicating that this topic is highly relevant and receiving significant attention in the current period. Furthermore, these documents have been well received in the academic community, with an average citation per document of 5,228. The study also reveals widespread collaboration among authors, with 307 authors involved, 34.78% of whom are international, indicating a global dimension to this research. Topics discussed include resource management, operational efficiency, and the social and environmental impacts of SMEs. Overall, the results of this study show that SME resilience and sustainable innovation are gaining significant attention in the academic community, driven by international collaboration and innovative approaches to addressing sustainability challenges in business.

Keywords: *SME Resilience, Sustainable Innovation, Environmental Management.*

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INTRODUCTION

Improving the resilience of broiler chicken MSMEs in Jakarta, a densely populated metropolitan city, poses significant challenges in environmental management and sustainable use of natural resources. As a significant micro-enterprise sector, broiler chicken MSMEs play a crucial role in meeting the chicken consumption needs of urban communities, especially in supporting social programs such as the Free Nutritious Meal Program. Retail demand, supply chains, and the dynamics of the modern food market influence the demand for broiler chicken in urban areas like Jakarta. In 2024, Indonesia faces increasing pressure on egg and chicken meat supply as demand for animal protein continues to grow alongside population dynamics and the expansion of national nutrition programs (Food and Agriculture Organization, 2024; Badan Pusat Statistik, 2024). The demand for broiler chicken tends to be responsive to price, consumer income, and variations in daily consumption and urban culinary events (Carson et al., 2020). However, this sector faces various challenges, particularly in waste management, the efficient use of natural resources, and its environmental impact. Recent research also emphasizes the need to adopt pilot-driven approaches and open market ecosystems to enhance business

model innovation and crisis response capacity among MSMEs, including the provision of broiler chicken in urban markets (Massiéra, 2024). Furthermore, understanding entrepreneurial values can strengthen sustainable practices in local food supply chains, although their adoption needs to be adapted to the context of food MSMEs in Indonesia (Arshi & Wallis, 2024).

Broiler chicken MSMEs, while contributing to the local economy, often operate under systems that are not entirely environmentally friendly. Broiler chicken production involves substantial use of water, energy, and other natural resources and generates substantial waste, including chicken manure, feathers, and food scraps. Without proper waste management, soil and water pollution can occur, and greenhouse gas emissions increase. Poor waste management poses a real threat to Jakarta's environment, which already faces worsening pollution and natural resource degradation. Therefore, implementing sustainable environmental management principles is crucial to mitigate these negative impacts and ensure the survival of broiler chicken MSMEs amidst increasingly fierce market competition. With the rapid growth of the industry in Jakarta, environmental management challenges are becoming increasingly complex. MSMEs in the broiler chicken industry not only face competitive price and quality challenges but must also comply with increasingly stringent regulations on waste management and environmental impact. One of the main challenges is managing organic waste, such as chicken manure. Organic waste and leftover cuttings can become sources of pollutants if disposed of carelessly, potentially contaminating groundwater and surface water, producing odors, and attracting health vectors. The concept of green process innovation highlights the need for methodological changes to reduce pollutants, increase efficiency, and reduce overall environmental impact (Frare & Beuren, 2021). Implementing green practices can transform production activities to be more environmentally friendly by focusing on energy savings, waste reduction, and improving environmental performance (Frare & Beuren, 2021).

If this waste is not managed properly, it can pollute the environment and pose health risks to the surrounding community. Furthermore, the use of natural resources, especially water, is a major problem, as Jakarta is experiencing a water shortage crisis. The unsustainable use of natural resources, such as reliance on fossil fuels for operations, also has long-term environmental impacts. Therefore, innovation in waste management and the more efficient and environmentally friendly use of natural resources are essential. Sustainable innovation in this sector can reduce dependence on limited natural resources, mitigate pollution, and increase the operational efficiency of broiler chicken MSMEs in Jakarta.

Beyond environmental management, it is also important to emphasize the role of community empowerment in this sustainability effort. Sustainable innovation is not only about technology; it also involves building community capacity to understand the importance of effective environmental management. Community empowerment through training and education on waste management, efficient resource use, and the application of environmentally friendly principles in the operational activities of broiler chicken MSMEs is a key step towards this sustainability goal. Therefore, a comprehensive study of broiler chicken demand in Jakarta requires integrating demand analysis, warehouse/logistics structures, inventory cost dynamics, and policy options to maintain supply stability and reasonable prices for consumers in the big city (Pedersen et al., 2012; Carson et al., 2020; Setianto et al., 2022).

Within this context, MSME resilience refers to the ability of a micro, small, and medium enterprise to survive, recover, and even grow in the face of short-term and long-

term external disruptions, such as economic crises, regulatory changes, natural disasters, or rapid market changes (Leipziger et al., 2024; Ciambotti et al., 2022). This resilience is not only relatively passive but also includes adaptive capacity, business model innovation, and efficient resource management during periods of uncertainty (Leipziger et al., 2024; Ciambotti et al., 2022). Within a large city like Jakarta, MSME resilience is influenced by ecosystem factors, including access to resources, policy support, business networks, and the ability to navigate internal dynamics such as business model innovation and operational flexibility (Leipziger et al., 2024). Systematic research on business model transitions emphasizes that resilience is related to the ability to make incremental changes to the business model while maintaining firm performance (Leipziger et al., 2024). In addition, the literature on resilience highlights the role of dynamic capacity, entrepreneurial orientation, and resilience as antecedents of small business performance, while research on adaptive markets shows how market experimentation capabilities and open policies can enhance business model innovation during crises (Massiéra, 2024).

Internal factors contributing to MSME resilience include dynamic capabilities, entrepreneurial orientation, business model innovation, and resilience to risk through continuous learning and strategic flexibility (Leipziger et al., 2024). External factors such as the entrepreneurial ecosystem, public policy, access to financing, and MSME networks also play a crucial role in shaping resilience (Leipziger et al., 2024; Ciambotti et al., 2022). Crisis management literature further indicates that adaptive market experimentation and open marketing practices can strengthen business continuity, with strategic flexibility acting as a mediating factor (Massiéra, 2024).

For broiler chicken MSMEs, sustainable innovation plays a strategic role in addressing input cost volatility, demand dynamics, and supply chain risks in metropolitan contexts. Sustainable innovation can be realized through diversification of feed sources, efficiency improvements, and the implementation of animal welfare practices (Baiocco et al., 2023; Leipziger et al., 2024). Furthermore, environmentally friendly operational models can reduce costs while enhancing brand image and market access. Sustainable innovation also encourages collaboration with local suppliers and communities, strengthening ecosystem resilience (Baiocco et al., 2023; Leipziger et al., 2024).

Environmental management in the broiler chicken industry includes practices such as pollution prevention, resource efficiency, waste management, and animal health protection (Figueiredo et al., 2024; Campos et al., 2023; Frare & Beuren, 2021). The adoption of environmental innovation is associated with improved environmental performance and competitiveness, as well as greater access to sustainable financing and a stronger market reputation (Figueiredo et al., 2024; Campos et al., 2023). Support for environmental management is influenced by management capacity, partnerships, and access to green technology (Cassells & Lewis, 2017; Degeorge & Fayolle, 2011).

RESEARCH METHODS

This study uses a literature review method to analyze the transformation of remote work in the context of the digital era and sustainability. The literature used in this study includes articles published between 2021 and 2024. To ensure quality and credibility, only articles published in reputable journals, indexed in major scientific databases, and in categories Q1 to Q3, were included in this review. Selected articles should address topics relevant to the research theme of MSME resilience and sustainable innovation. The inclusive criteria for the theme "Resilience of Broiler Chicken MSMEs: Sustainable Innovation for Environmental Management in Jakarta" include articles that discuss the

resilience of MSMEs, particularly in the broiler chicken sector, in addressing environmental and social challenges through sustainable innovation. Relevant research includes the use of digital technologies such as cloud computing and business management applications to improve operational efficiency and transparency, as well as environmentally friendly management strategies, such as waste management and energy efficiency. In addition, articles discussing the social and environmental impacts of broiler chicken MSMEs, the application of green economy principles, and the contribution of MSMEs to sustainable development are also included in this inclusive criteria. All articles that examine the positive environmental and societal impacts of broiler chicken MSMEs, as well as the sustainability strategies implemented by this sector in Jakarta, are eligible for reference in this study.

The literature selection process was conducted through a systematic search using major scientific databases, such as Scopus, using specific keyword combinations to ensure the relevance of the articles found. After searching, articles that met the criteria were selected based on their titles and abstracts, then further evaluated based on their complete content to ensure their alignment with the research focus. Other inclusion criteria included articles containing empirical data or case studies, as well as articles using valid quantitative or qualitative methodologies for MSME resilience and sustainable innovation. From this selection, 93 articles relevant to the topic were selected for further analysis. This analysis categorized articles discussing the application of technology for operational efficiency, including cloud-based systems and digital applications for business management, as well as waste management and energy efficiency strategies. Researchers also identified discussions regarding the social and environmental impacts of broiler chicken MSME activities, including their impact on sustainable development in Jakarta.

Table 1. Research questions

Research Questions (RQ)	Motivation
RQ1: What is the trend in the number of articles published each year on MSME resilience and sustainable innovation?	The motivation for answering this question is to identify whether the topics of MSME resilience and sustainable innovation are receiving increasing attention in the academic literature.
RQ2: How has the trend in the number of citations of scientific publications related to MSME resilience and sustainable innovation changed over time?	The purpose of this question is to measure the influence and impact of scientific publications related to this topic.
RQ3: What are the most used sources by researchers on the topic of MSME resilience and sustainable innovation?	The motivation for this question is to identify the main sources used as references in research on MSME resilience and sustainable innovation.
RQ4: Who is the most influential author in the field of MSME resilience and sustainable innovation?	This question aims to identify key contributors who have played a role in developing knowledge on MSME resilience and sustainability innovation.
RQ5: How is the distribution of country participation in global research or activities related to MSME resilience and sustainable innovation?	This study aims to analyze the inequality in country participation in MSME resilience and sustainable innovation at the global level.

Processed by the author, 2024.

RESULTS AND DISCUSSION

This study demonstrates significant developments in MSME resilience and sustainable innovation, with 92 papers registered between 2021 and 2024. The number of papers published annually has grown by 27.23% annually, indicating that this research



is in a very active, rapidly developing phase. The majority of publications are scholarly articles (72 papers), reflecting that most contributions to this topic come from leading scientific journals. The average age of the papers is very young at 1.38 years, indicating that the topic of MSME resilience and sustainable innovation has received close attention in recent years. This is further reinforced by the average citation rate per paper, which reached 5,228, indicating that although most papers are relatively new, they have been well received by the academic community and make important contributions to the development of knowledge in this field.

The data also indicate extensive author collaboration, with 307 authors participating in the research. The average number of authors per document was 3.45, indicating that this topic was addressed more collaboratively than by a single author. However, only 10 documents were single-authored, indicating that collaboration was a key aspect of the research. Furthermore, 34.78% of these collaborations involved international authors, demonstrating a global dimension to research on MSME resilience and sustainable innovation, contributing to cross-border knowledge exchange.

Regarding the document's content, there are 373 Keywords Plus and 396 keywords added by the author, indicating that various topics and subtopics related to MSME resilience and sustainable innovation have been explored. This covers various aspects, including resource management, operational efficiency, and the social and environmental impacts of MSMEs, which are increasingly relevant as awareness of the importance of sustainability in the business world grows.

Overall, this study's results indicate that the topic of MSME resilience and sustainable innovation is gaining significant attention in the academic community, driven by contributions from international researchers using innovative technologies and approaches. This study also provides an overview of the importance of sustainability in the MSME context and of the various parties involved in collaborative efforts to address existing challenges.

Annual Publication Coverage

This data shows the trend in the number of publications on MSME resilience and sustainable innovation between 2021 and 2024, providing a snapshot of how this topic has evolved in the academic literature over time. In 2021 and 2022, there were three publications each year, reflecting the topic's relative novelty in the first two years and its limited attention from researchers. The low number of publications in these first two years may also indicate that research on MSME resilience and sustainable innovation is still in its infancy, with researchers still developing theoretical and conceptual foundations. However, in 2023, the number of publications increased slightly to five, indicating that interest in the topic is growing, with more researchers exploring various aspects of MSME resilience and the application of sustainable innovation in this context. This increase indicates that the topic is gaining more attention, both locally and globally. A significant spike occurred in 2024, when the number of publications jumped to 14, indicating that MSME resilience and sustainable innovation are gaining more traction among researchers. This year, the topic has begun to gain greater prominence in academic discourse, alongside the growing number of policies supporting sustainability in the MSME sector.

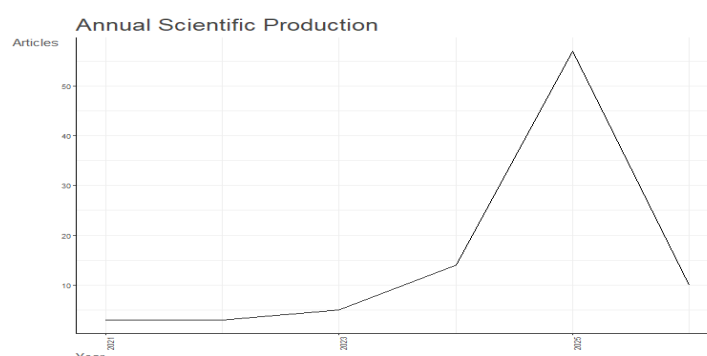
Overall, this data demonstrates a rapid growth trend in research on MSME resilience and sustainable innovation. This began with little attention in the first two years, followed by a sharp surge starting in 2024. This reflects not only the increasing relevance of this

topic globally but also a growing awareness and support for the importance of sustainability in the MSME sector.

Table 2. Annual coverage

Year	Articles
2021	3
2022	3
2023	5
2024	14

Figure 1. Annual publication graph



Processed by the authors using RStudio (Bibliometrix) based on the Scopus database, 2024.

Coverage Based on Trends in the Number of Citations of Scientific Publications

This data illustrates citation trends and the number of articles on the research topic from 2021 to 2024, providing a clearer picture of the topic's impact and development in the academic literature. In 2021, although only three articles were published, each had a relatively high average citation count of 29.67, with a MeanTCperYear of 4.94 and 6 years of CitableYears, indicating that publications in that year had a significant, albeit small, impact. In 2022, although the number of publications remained at three, the average citation count per article jumped to 67.33, and the annual citation count increased to 13.47, reflecting a substantial increase in the relevance and impact of the articles published this year. However, in 2023, despite the increase in the number of publications to 5 articles, there was a sharp decrease in citations per article, to only 2.2, with the annual citation rate dropping significantly to 0.55, indicating that, despite more articles being published, their impact in the academic community is declining, possibly because they are not sufficiently accepted or cited by other researchers. The downward trend in citations per article continues in 2024, with 14 articles. The average citation rate per article drops to 4.57 in 2024, indicating that, despite increasing research on this topic, newer articles are not receiving the same level of citations.

Table 2. Coverage of trends in the number of citations of scientific publications

	MeanTCperArt		MeanTCperYear	CitableYears
2021	29.67	3	4.94	6
2022	67.33	3	13.47	5
2023	2.2	5	0.55	4
2024	4.57	14	1.52	3

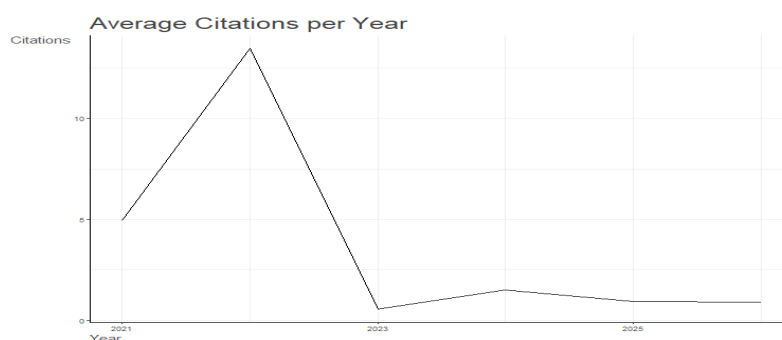


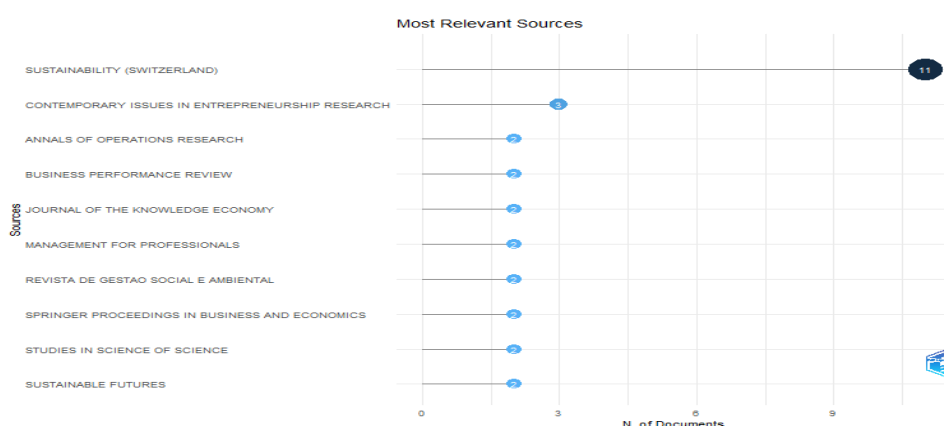
Figure 2. Annual publication graph

Processed by the authors using RStudio (Bibliometrix) based on the Scopus database, 2024.

Coverage Based on the Most Sources Used by Researchers

This data reflects topics relevant to current challenges in business, entrepreneurship, management, technology, and sustainability. Journals such as Sustainability (Switzerland) show that sustainability is a central theme involving planning, resource management, and impacts on the economy, society, and environment. Other journals highlight entrepreneurship in developing countries and how it responds to social, economic, and environmental challenges. Technology-focused journals examine how technology improves efficiency and advances sustainability through environmentally friendly innovation. Journals on corporate social responsibility show its role in environmental management and social and ecological impacts. Interdisciplinary journals illustrate the links among managerial theory, human behavior, and mathematical analysis in developing efficient and sustainable strategies. There is also a focus on sectors such as food systems and the synergy of artificial intelligence and financial technology. Overall, this data shows sustainability as a key theme across disciplines and sectors for a more environmentally friendly, inclusive, and sustainable future.

Figure 3. Most reference source graph



Processed by the authors using RStudio (Bibliometrix) based on the Scopus database, 2024.

Coverage Based on Most Authors

This data reflects a wide range of journal publications on sustainability, entrepreneurship, digital transformation, and the crucial role of small and medium-sized enterprises (SMEs) in the global economy. Authors such as Olubiyi TO, Longe OB, Suseela Devi KS, and others address key issues, including resilience, future trends, and challenges within SMEs, as well as the impact of digital transformation on business model innovation, particularly in Industry 5.0. These articles are published in leading journals such as Contemporary Issues in Entrepreneurship Research, Multidisciplinary Science Journal, Journal of Behavioral Science, and Annals of Operations Research. While most of these publications are in their early stages with 0 citations, some have begun to gain greater attention, such as an article in Annals of Operations Research that recorded 26 citations and a citation rate of 13 per year (TCpY), indicating high relevance. These articles highlight the importance of technology applications, particularly artificial intelligence and innovation, in supporting sustainable growth in SMEs. They also highlight the important role of SMEs in supporting the green economy and digital transition, including open innovation, green management, and leveraging technology to advance sustainability. Overall, this data reflects recent trends in research on leveraging technology to support sustainability and innovation in small and medium-sized enterprises, with some articles demonstrating more significant impacts in a short time.

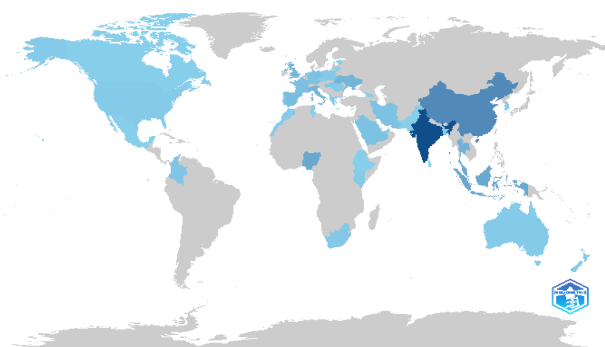
Coverage Based on the Distribution of Country Participation

The data in this table shows the frequency of occurrence of each region or country within the dataset. India has the highest number of occurrences at 48, followed by China with 25. Indonesia, Malaysia, and Nigeria each have 14 occurrences, indicating substantial participation. Countries with moderate frequency include Thailand (11), Italy and Ukraine (10 each), the United Kingdom (9), and Spain (7). France appears 6 times, while Germany, Iran, and Saudi Arabia each appear 5 times. Several countries have 3 occurrences, including Colombia, Greece, Hungary, Poland, Portugal, South Africa, and the United Arab Emirates. Others appear 2 times, such as Albania, Australia, Bangladesh, the Czech Republic, Kenya, Lebanon, Morocco, New Zealand, Romania, the USA, and Canada. Countries with only 1 occurrence include Cyprus, Estonia, Ethiopia, Georgia, Lithuania, Mexico, the Netherlands, Pakistan, South Korea, Sri Lanka, and Tunisia.

This table reflects the distribution of participation across countries. Higher frequencies indicate stronger representation, while lower frequencies indicate more limited participation. This data provides insight into countries' involvement in the field under study.

Figure 4. Graphics Reference Sources

Country Scientific Production



Processed by the authors using RStudio (Bibliometrix) based on the Scopus database, 2024.

Discussion

Practical Recommendations for Environmental Management of Broiler Chickens in Jakarta

Best practices include: (a) adoption of environmentally friendly technologies to improve feed efficiency and barn temperature management, thereby reducing waste and emissions and increasing productivity; (b) redesigned packaging and by-products to reduce chemical/plastic waste through recycling programs and environmentally friendly packaging; (c) collaboration with local suppliers, research institutions, and local governments for access to innovative solutions and environmental incentives; and (d) implementation of environmental training based on MSME needs, including continuous monitoring and evaluation of environmental impacts as part of daily operational management (Figueiredo et al., 2024; Campos et al., 2023; Cassells & Lewis, 2017; Degeorge & Fayolle, 2011). Policy recommendations for Jakarta include funding support for the adoption of green technologies, the development of logistics and digital infrastructure that facilitate environmental management (e.g., water/air quality sensors, integrated waste management systems), and mentoring programs that emphasize the implementation of sustainable environmental systems at the broiler chicken MSME level (Figueiredo et al., 2024; Campos et al., 2023; Degeorge & Fayolle, 2011). Theoretically, the environmental management framework in broiler chicken MSMEs should integrate the triple bottom line principle (economic, environmental, social) with the MSMEs' dynamic ability to adapt to changing regulations and consumer preferences, while being supported by ecosystem collaboration and relevant public policies (Campos et al., 2023; Frare & Beuren, 2021; Figueiredo et al., 2024). Effective environmental management can also enhance public trust, access to modern markets, and the potential for sustainable innovation as a competitive differentiator in highly competitive urban markets (Figueiredo et al., 2024; Campos et al., 2023; Cassells & Lewis, 2017). The implementation of comprehensive management strategies, such as human resource development, information technology adoption, effective financial management, digital marketing, supply chain management, and quality management, can improve operational efficiency, competitiveness, and sustainability for MSMEs in Indonesia (Yatimin et al., 2024). MSMEs that adopt online marketing, marketplaces, and digital technology are better able to maintain revenue and expand markets in the new normal and digital economy era (Artanto et al., 2022). However, many actors (Jakarta street vendors, Medan MSMEs) still do not optimally utilize digital platforms, so their resilience is weak (Allo et al., 2024).

The Relationship Between Resilience, Sustainable Innovation, and Environmental Management

The digital transformation of Indonesian small and medium enterprises (SMEs) contributes to job creation, innovation, and overall economic growth by improving efficiency, managing processes, expanding customer bases, and increasing competitiveness. Government policies can improve public welfare by promoting micro, small, and medium enterprises (MSMEs), which play a vital role in the Indonesian economy by absorbing labor, contributing to foreign exchange, and contributing to GDP (Wati, D. et al., 2024). MSME resilience can be defined as the capacity to survive, adapt, and grow in the face of environmental disruptions, primarily through sustainable

innovation that integrates economic, environmental, and social dimensions (Leipziger et al., 2024; Ciambotti et al., 2022; Rosa & Bernini, 2023). Sustainable innovation itself focuses on the introduction of practices, products, or business models that not only increase profitability but also reduce environmental impacts and improve social welfare, thereby increasing the company's sustainability capabilities and making access to sustainable financing easier (Baiocco et al., 2023; Campos et al., 2023; Cassells & Lewis, 2017). Environmental management becomes the operational axis that connects the two concepts, because practices such as resource efficiency, waste management, and compliance with environmental standards not only reduce environmental risks but also contribute to the reputation and market opportunities of MSMEs, enabling long-term resilience in urban ecosystems such as Jakarta (Figueiredo et al., 2024; Campos et al., 2023; Degeorge & Fayolle, 2011). A conducive business environment, government support (credit relaxation, social assistance, training), and business networks help MSMEs survive, although the direct effect of government support on resilience is not always significant in all contexts (Saerang et al., 2023; Hidayat et al., 2020). Theoretically, the synergy among dynamic capacity, entrepreneurial orientation, and integrated environmental practices yields a set of strategies that enhance the performance and resilience of MSMEs in dynamic markets (Leipziger et al., 2024; Massiéra, 2024; Campos et al., 2023). These efforts are often mediated by cross-sector collaboration, access to environmentally friendly technologies, and policy support that facilitates the adoption of sustainable innovations at the MSME level (Figueiredo et al., 2024; Campos et al., 2023; Degeorge & Fayolle, 2011).

Practical Implications for Msmes and Future Research Directions

In practice, environmental management should be viewed as a core component of sustainable innovation strategies to strengthen MSME resilience. Practices such as energy efficiency, waste reduction, the use of environmentally friendly packaging, and the application of sensor technology for process quality monitoring are steps that are in line with the literature on sustainable innovation and environmental management, and have been shown to improve environmental performance and brand image, ultimately strengthening competitiveness in urban markets (Figueiredo et al., 2024; Campos et al., 2023; Cassells & Lewis, 2017; Degeorge & Fayolle, 2011). For Jakarta and the context of food MSMEs, the establishment of mentoring programs targeting environmental management capacity building, access to green solutions, and digital logistics facilities can accelerate the adoption of sustainable innovations while maintaining supply continuity and stable prices (Figueiredo et al., 2024; Degeorge & Fayolle, 2011). Future research should explore BMT (business model transition) and bricolage models as pragmatic approaches for resource-constrained MSMEs to gradually integrate sustainable innovation and environmental practices, while accounting for variations across regional contexts and industry sectors (Leipziger et al., 2024; Massiéra, 2024; Campos et al., 2023). Synthesizing, the relationship between MSME Resilience, Sustainable Innovation, and Environmental Management is a dynamic framework influenced by internal capacity, ecosystem support, and public policy; understanding these interactions in a context-specific manner will increase MSMEs' chances of survival, growth, and contribution to sustainable development in megacities like Jakarta (Leipziger et al., 2024; Baiocco et al., 2023; Figueiredo et al., 2024).

CONCLUSION

The conclusions of this study indicate that the topic of MSME resilience and sustainable innovation is experiencing rapid growth, with 92 papers registered between 2021 and 2024. With an annual growth rate of 27.23%, this study indicates a very active and dynamic phase in this research. The majority of publications are scientific articles (72 papers), indicating that contributions from leading scientific journals dominate this topic. The average age of the papers is still very young at 1.38 years, indicating that MSME resilience and sustainable innovation have received significant attention in recent years. Although most of the papers are new, the relatively high citation rate (an average of 5,228 citations per paper) indicates that the academic community has well received this research and makes a significant contribution to the development of knowledge. The data also show extensive collaboration among authors, with 307 authors involved and an average of 3.45 per paper, indicating that this topic is primarily addressed through a collaborative approach. Only 10 papers are solo-authored, underscoring the importance of collaboration in this research. Furthermore, 34.78% of the collaborations involved international authors, demonstrating the global dimension of this research and its contribution to cross-border knowledge exchange. The topics explored in this research include resource management, operational efficiency, and the social and environmental impacts of MSMEs, all of which are increasingly relevant as sustainability awareness grows in the business world.

Overall, this research reflects the importance of MSME resilience and sustainable innovation within the academic community, driven by international collaboration and innovative approaches. This demonstrates that various stakeholders are engaged in a collaborative effort to address challenges and create sustainable solutions in the MSME context.

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