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Integrating MSMEs' business agility into SDGs framework: A pathway toward sustainable environmental economy

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ABSTRACT

Background: Micro, small, and medium enterprises (MSMEs) are pivotal to Indonesia's economy, contributing 61% to GDP and 97% to employment, yet face significant barriers in adopting sustainable practices amid environmental challenges like 216 million tons of annual CO_2 emissions. This study aims to analyze how business agility enables MSMEs to transition toward a green economy, aligning with Sustainable Development Goals (SDGs) 8, 9, and 13. Existing literature highlights agility's role in SME innovation but lacks a multidimensional framework for MSMEs in developing economies, particularly Indonesia, where low green adoption (<5% ISO 14001 certification) and financing gaps (IDR 2,400 trillion shortfall by 2026) persist. **Methods**: An integrative literature review (ILR) was conducted, synthesizing secondary qualitative data from sources like Bappenas report, peer-reviewed studies, and reports from OECD, World Bank, and UNDP. Using Whittemore and Knafl's framework, the study employed thematic analysis within a dynamic capabilities theory lens, categorizing findings into firm-level (e.g., eco-innovation), network-level (e.g., collaborative ecosystems), and institutional-level (e.g., policy adaptability) dimensions. **Findings**: Results reveal that firm-level agility drives eco-innovation but is limited by low digital transformation (16% adoption). Network-level agility, through partnerships like West Java's 38 cleantech startups, supports SDG 9, while institutional-level agility addresses financing gaps, aligning with SDG 13. Regional disparities, such as South Sulawesi's 74% lack of green processes, highlight the need for tailored agility strategies. Triangulated data confirm agility's role in bridging micro-level practices with macro-level SDG goals, extending dynamic capabilities theory. **Conclusion**: Business agility empowers MSMEs to navigate environmental and market challenges, fostering sustainable transitions critical for Indonesia's net-zero goal by 2060. **Novelty/Originality**: This study offers a novel multidimensional framework linking agility across firm, network, and institutional levels to SDGs, addressing underexplored Indonesia-specific challenges and proposing actionable policy interventions for green MSME empowerment.

KEYWORDS: business agility, MSMEs, green economy, sustainable development, dynamic capabilities, eco-innovation.

1. Introduction

Micro, small, and medium-sized enterprises (MSMEs) form the backbone of Indonesia's economy, contributing over 61% to the gross domestic product (GDP) and employing up to 97% of the national workforce (Kemenko Perekonomian, 2025; World Bank, 2023). These

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enterprises are pivotal in driving economic growth, fostering local entrepreneurship, and supporting livelihoods across urban and rural communities. However, their operations face mounting pressures from environmental degradation, climate change, and increasing global demands for sustainable production systems. These challenges not only threaten their economic viability but also exacerbate environmental impacts, such as heightened energy consumption and carbon emissions, with MSMEs contributing approximately 216 million tons of CO_2 annually in Indonesia (Bappenas, 2025b; OECD, 2019; UNDP, 2025). The urgency to transition toward an environmental economy—one that decouples economic growth from ecological harm—has become a national and global priority, as outlined in Indonesia's National Medium-Term Development Plan (RPJMN 2025–2029) and the Paris Agreement (Bappenas, 2025a; UNDESA, 2020). This transition demands not only technological innovation but also a fundamental shift in organizational behavior, specifically through the lens of business agility, which enables firms to sense, respond, and adapt to dynamic environmental and market conditions (Teece et al., 2016; Doz & Kosonen, 2010).

Business agility is defined as an organization's ability to sense environmental changes, respond rapidly to emerging challenges, and adapt strategies to maintain resilience and competitiveness (Tallon et al., 2019; Overby et al., 2006). For MSMEs, agility extends beyond traditional market responsiveness to encompass the integration of sustainability principles, resource efficiency, and environmental awareness into their business models. This adaptability is critical in volatile, uncertain, complex, and ambiguous (VUCA) environments, where MSMEs must navigate disruptions such as post-pandemic economic recovery, climate-induced market shifts, and evolving regulatory frameworks (Hamieddine & Akioud, 2025; Rigby et al., 2018). Agile MSMEs adopt flexible structures, leverage digital tools, and foster participatory leadership to enable rapid decision-making, which is essential for thriving amid crises like COVID-19 or aligning with sustainability mandates (Kwasek et al., 2025; Arno, 2025). At its core, agility integrates dynamic capabilities—sensing opportunities, seizing them, and transforming operations—to ensure long-term sustainability, particularly for resource-constrained MSMEs facing external shocks (Teece et al., 2016; Zahoor et al., 2022). This proactive orientation transcends mere reactivity, emphasizing strategic sensitivity, resource fluidity, and collective commitment to mitigate inertia and promote purposeful adaptation across strategic, tactical, and operational levels (Doz, 2020; Arno, 2025).

The theoretical foundation of this study is rooted in dynamic capabilities theory, which posits that organizations achieve competitive advantage by sensing environmental shifts, seizing opportunities, and transforming resources to align with changing conditions (Teece et al., 2016). In the context of MSMEs, dynamic capabilities manifest as agile practices that enable firms to pivot operations—such as adopting green technologies or reconfiguring supply chains—while balancing economic and ecological objectives (Rawashdeh et al., 2024; Ali et al., 2023). For instance, agile MSMEs in Indonesia's agroindustry have demonstrated resilience by adopting digital platforms to streamline supply chains during disruptions, a practice that aligns with sustainability goals by reducing waste and emissions (Ali et al., 2023; Bappenas, 2025b). Enablers of agility, such as efficient decision-making, knowledge deftness, and IT adaptiveness, enhance MSMEs' capacity to respond to disruptions while pursuing sustainable development objectives (Kwasek et al., 2025; Tallon et al., 2019 Spence et al., 2008). In sectors like manufacturing or high-tech B2B, where market volatility is pronounced, agility manifests through leadership that fosters cultural shifts, overcoming challenges like mindset resistance or transformation fatigue (Zahoor et al., 2022; Arno, 2025). This holistic approach positions agility as a critical mechanism for MSMEs to harmonize economic growth with social and environmental responsibilities, contributing to poverty reduction, innovation, and inclusive employment under the United Nations Sustainable Development Goals (SDGs) (UNDESA, 2020).

To further understand the external constraints that impede MSMEs' green adoption, Institutional Theory offers a valuable complementary lens. While dynamic capabilities explain firms' internal ability to adapt, institutional theory focuses on how external

pressures—regulatory, normative, and cognitive—shape organizational behavior (DiMaggio & Powell, 1983). Coercive pressures arise from government regulations and enforcement mechanisms; mimetic pressures emerge when firms imitate successful peers to reduce uncertainty; and normative pressures stem from professional networks and industry standards. In the Indonesian context, the low adoption of ISO 14001 certifications (<5%) can be attributed to a combination of weak coercive pressures (fragmented and inconsistently enforced environmental regulations), limited mimetic pressures (scarcity of visible green role models among MSMEs), and underdeveloped normative pressures (lack of professional networks promoting sustainability standards). This "institutional void" creates systemic barriers that perpetuate the financing gap (IDR 2,400 trillion) and low environmental literacy among MSMEs. Integrating institutional theory with the dynamic capabilities framework thus provides a more comprehensive understanding of why MSMEs struggle to adopt green practices and highlights the necessity of multi-level agility—not only at the firm level but also within the institutional environment—to enable sustainable transitions (Bappenas, 2025b; OECD, 2019).

The SDGs, particularly SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 13 (Climate Action), provide a global framework for aligning MSME practices with ecological preservation and social inclusion. SDG 8 emphasizes sustainable economic growth and decent work, areas where MSMEs excel by creating jobs and fostering entrepreneurship. SDG 9 calls for resilient infrastructure and innovation, which agile MSMEs can support through eco-innovation and green technology adoption. SDG 13 underscores the urgency of climate action, urging businesses to reduce emissions and enhance resilience to climate risks (UN, 2021; UNDESA, 2020). However, despite their economic significance, Indonesian MSMEs face substantial barriers to implementing environmentally sound practices. Fewer than 5% hold ISO 14001 environmental certifications, and only 26% of micro firms engage in formal green processes, reflecting low environmental literacy, inadequate financing (with a shortfall of IDR 2,400 trillion by 2026), and weak institutional support (Bappenas, 2025b; OECD, 2019; INDEF, 2024). These challenges highlight the need for agility to bridge the gap between current practices and global sustainability targets, enabling MSMEs to contribute to Indonesia's net-zero goal by 2060 (Bappenas, 2025a; Yusuf et al., 2023).

The environmental economy, which emphasizes economic activities that maintain or improve environmental quality while fostering sustainable livelihoods, offers a promising framework for MSME transformation. This concept aligns with the circular economy model, where waste is minimized, and resources are reused to create long-term value (OECD, 2019; Bappenas, 2024). For MSMEs, the environmental economy presents opportunities to develop eco-friendly products, adopt green technologies, and access emerging markets like the EU Carbon Border Adjustment Mechanism (CBAM) (Bappenas, 2025b; Kwasek et al., 2025). Business agility facilitates this transition by enabling rapid adaptation to environmental regulations, shifting consumer preferences, and technological advancements. Agile MSMEs, for instance, can integrate renewable energy or upcycling practices into their operations, reducing emissions and enhancing competitiveness (Bocken et al., 2014; Arno, 2025). Collaborative networks, such as partnerships with government, academia, or green startups (e.g., 38 cleantech startups in West Java), further amplify agility by fostering knowledge exchange and resource sharing within green value chains (New Energy Nexus Indonesia, 2024; Bappenas, 2025b).

Previous studies have explored MSME sustainability through technological or policy lenses, focusing on cleaner production, waste management, or regulatory compliance (Bocken et al., 2014; World Bank, 2023). For example, Liu & Yang (2019) demonstrate that agility drives innovation in SMEs, with sustainability-oriented firms exhibiting higher eco-innovation rates, such as adopting renewable energy or waste management systems. Similarly, Chung et al. (2019) highlight how agility enhances knowledge creation, enabling SMEs to align with sustainability goals. However, the specific role of business agility as a driver of environmental adaptation in MSMEs remains underexplored, particularly in developing economies like Indonesia (Tallon et al., 2019; Doz, 2020). While resilience has

been studied in the context of MSME survival during crises like COVID-19, agility extends beyond survival to encompass proactive learning, rapid decision-making, and continuous innovation that enable small businesses to thrive in dynamic ecological and economic environments (Rigby et al., 2018; Arno, 2025). Moreover, existing literature often focuses on large firms or generalized resilience, neglecting the resource constraints and sectoral variations (e.g., agriculture vs. manufacturing) that characterize MSMEs (OECD, 2019; INDEF, 2024).

Indonesia's RPJMN 2025–2029 prioritizes a green and circular economy, positioning MSMEs as key agents in promoting sustainable local economies through green innovation, eco-friendly products, and community-based enterprises (Bappenas, 2025a; OECD, 2019). However, regional disparities complicate this transition. For instance, South Sulawesi reports a 74% lack of green processes among MSMEs, while West Java shows growth in green startups, highlighting uneven readiness (Bappenas, 2025b; Arifah et al., 2024). The integration of business agility into this framework offers a novel perspective, enabling MSMEs to dynamically balance economic objectives with ecological responsibility, creating shared value for businesses and the environment (Bocken et al., 2014; Rawashdeh et al., 2024). This is particularly relevant to conservation and sustainability studies, as it underscores the socio-economic dimensions of environmental management, where livelihood strategies, local innovation, and adaptive management contribute to ecosystem health and reduced environmental pressures (OECD, 2019; UNDP, 2025).

Despite the growing body of research, several critical gaps persist in understanding how business agility can enhance MSME contributions to environmental sustainability. First, while agility is well-documented as a driver of organizational adaptability, its application to MSME sustainability transitions—particularly in addressing environmental challenges like high CO_2 emissions or financing gaps—remains underexplored (Teece et al., 2016; Bappenas, 2025b). Second, there is a lack of comprehensive frameworks linking agility across firm, network, and institutional levels to environmental outcomes, such as the IDR 2,400 trillion financing shortfall or low readiness for green practices (Bappenas, 2025b; New Energy Nexus Indonesia, 2024). Third, the intersection of agility with SDGs 8, 9, and 13 is often treated in isolation, with limited synthesis on how institutional barriers, such as fragmented ESG reporting or lack of national standards, hinder MSME contributions to net-zero goals (UNDESA, 2020; Bappenas, 2025b). Finally, the role of agility in addressing regional disparities and fostering inclusive green transitions is under-researched, necessitating integrative approaches that combine secondary data synthesis with contextual policy insights (Arifah et al., 2024; Arno, 2025).

This study hypothesizes that business agility, as a multidimensional capability encompassing firm-level innovation, network-level collaboration, and institutional-level policy adaptation, enables MSMEs to effectively integrate sustainability practices, thereby reducing environmental impacts and aligning with SDGs 8, 9, and 13. The hypothesis is grounded in dynamic capabilities theory, which suggests that agile MSMEs can sense and seize green market opportunities while transforming operations to achieve eco-innovation and resilience (Teece et al., 2016; Rawashdeh et al., 2024). Specifically, it posits that agility facilitates MSMEs' ability to adopt green technologies and circular models, leading to reduced emissions and enhanced competitiveness in Indonesia's environmental economy.

The objectives of this study are threefold: first, to analyze how MSMEs leverage business agility to adapt to environmental and market challenges, such as regulatory shifts and climate risks; second, to identify the key enablers and barriers influencing their transition toward sustainable business models, including financing, institutional support, and knowledge gaps; and third, to explore how integrating business agility within the SDGs framework contributes to broader environmental conservation and sustainable economic policy goals (Sivaiah & Vinodan, 2025). By employing an integrative literature review (ILR), this study synthesizes secondary qualitative data from the Bappenas (2025b) white paper Unveiling the Future of Sustainable Business through Empowering Green MSMEs, alongside peer-reviewed literature and international reports (e.g., OECD, 2019; World Bank, 2023). The ILR approach, following Whittemore and Knafl's (2005) framework, allows for a

comprehensive synthesis of management, sustainability, and policy perspectives, constructing a novel framework that bridges micro-level MSME practices with macro-level environmental outcomes (Torraco, 2005; Doz, 2020).

Theoretically, this study advances dynamic capabilities by linking agility to environmental sustainability in the MSME context, addressing gaps in applying this framework to developing economies. Practically, it offers policymakers insights into designing agility-oriented interventions, such as green financing schemes, capacity-building programs, and collaborative networks, to support Indonesia's net-zero transition by 2060 (Bappenas, 2025a). By arguing that sustainability is not solely a matter of technology or policy but also of organizational behavior and adaptability, this study positions agile MSMEs as catalysts for inclusive, resilient, and environmentally sustainable economic growth (Teece et al., 2016; Arno, 2025). The findings are expected to inform national strategies under National Medium-Term Development Plan/*Rencana Pembangunan Jangka Menengah Nasional (RPJMN*) 2025–2029, enhancing MSMEs' role in achieving SDGs and fostering a green economy in Indonesia. Figure 1 illustrates the distribution of environmental certification ownership by enterprise size category, highlighting the low adoption rates among Indonesian MSMEs (Bappenas, 2025b).

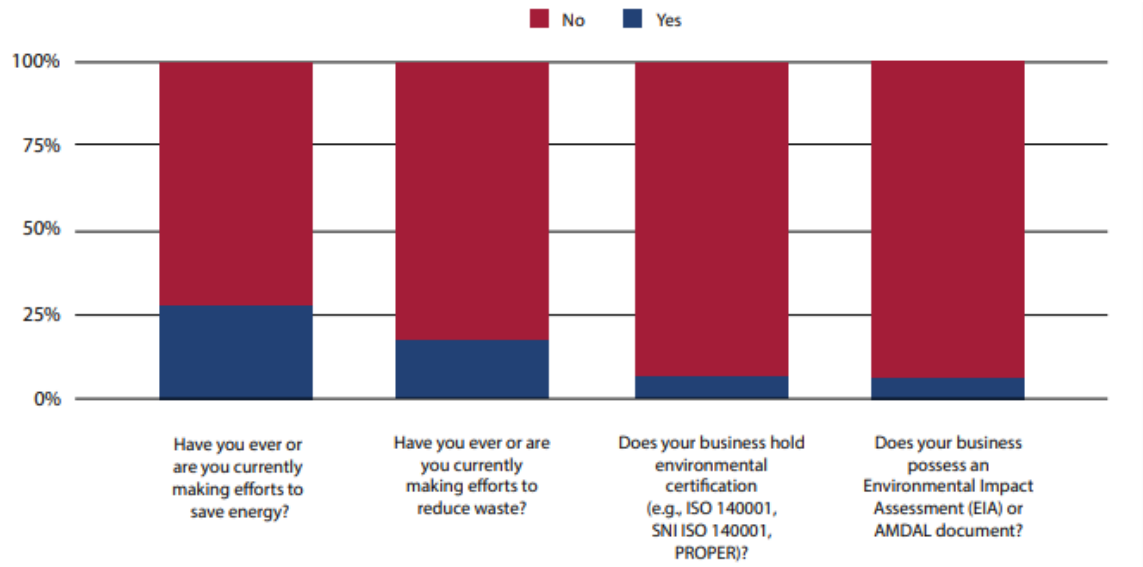

Fig. 1. Distribution of environmental certification ownership by enterprise size category (Bappenas, 2025b)

To guide this investigation, the study addresses the following research questions (RQ). How does business agility, across firm, network, and institutional levels, enable Indonesian MSMEs to adapt to environmental and market challenges, such as regulatory shifts and climate risks; what are the key enablers of and barriers to business agility that influence the transition of Indonesian MSMEs toward sustainable business models aligned with SDGs 8, 9, and 13; in what ways can a multidimensional agility framework contribute to bridging the gap between micro-level MSME practices and macro-level environmental policy goals within Indonesia's pathway to a net-zero economy by 2060. These questions are designed to systematically explore the mechanisms, contextual factors, and policy implications of integrating business agility into the sustainability transition of Indonesian MSMEs, ensuring coherence between the study's objectives, literature synthesis, and subsequent analysis.

2. Methods

This study adopts an Integrative Literature Review (ILR) approach to synthesize knowledge from multiple disciplines-management science, entrepreneurship, and environmental economics-to construct a conceptual framework explaining how business

agility can enhance the environmental and economic resilience of MSMEs in Indonesia. Unlike systematic reviews or qualitative syntheses, which are often limited to empirical studies using a specific research design, ILR is the method of choice as it provides a comprehensive understanding by systematically including both empirical and theoretical literature across varied research designs (Torraco, 2005; Oermann & Knafl, 2021). This broader and more varied scope facilitates the necessary theoretical integration and reinterpretation of findings within the evolving context of sustainable business practices.

The selection of ILR is further justified by the critical need to address the omission or deficiency (Torraco, 2005) in the existing, fragmented literature on this multi-faceted problem, particularly where research is emerging in different fields. By integrating these diverse findings, the review provides a significant, value-added contribution to the discipline, fulfilling the criterion of importance by developing a framework with relevance to real behavior in the dynamic MSME sector (Torraco, 2005). To ensure methodological rigor and comprehensiveness, this integrative review will systematically follow the established five-stage framework developed by Whittemore and Knafl (Oermann & Knafl, 2021): problem identification, literature search, data evaluation, data analysis, and presentation of findings.

2.1 Problem identification

The core problem lies in understanding how business agility can enable MSMEs to overcome barriers to sustainability, such as low green adoption (<5% ISO 14001 certification) and financing gaps (IDR 2,400 trillion shortfall), to contribute to Indonesia's net-zero transition by 2060 (Bappenas, 2025b). This aligns with the national agenda under RPJMN 2025–2029, which emphasizes green and circular economies (Bappenas, 2025a). The study explores how agility, as a dynamic capability, bridges micro-level MSME practices with macro-level environmental goals, addressing gaps in eco-innovation and policy adaptability.

2.2 Literature search

The research was conducted using secondary qualitative data, focusing on Indonesia's context from 2019–2025, aligning with ontological views of sustainability as socially constructed and epistemological emphasis on interpretive synthesis. No primary data collection occurred; instead, sources were manually curated for originality and relevance. Core data stems from the Bappenas (2025b) white paper Unveiling the Future of Sustainable Business through Empowering Green MSMEs, supplemented by peer-reviewed articles (e.g., Teece et al., 2016; Rawashdeh et al., 2024) and reports from credible international organizations (e.g., World Bank, 2023; OECD, 2019; UNDP, 2025).

Searches were conducted across academic databases, including Google Scholar, Scopus, and ScienceDirect, as well as policy repositories such as the Bappenas website and New Energy Nexus Indonesia. To ensure comprehensive coverage and enhance the replicability of the study, a systematic combination of keywords was employed. The search strategy was structured around three core concepts: the subject (MSMEs/SMEs), the primary mechanism (business agility/dynamic capabilities), and the context (sustainability/green economy/SDGs), with a geographical focus on Indonesia. The specific search strings and boolean operators used were as follows. Primary Search String: ("business agility" OR "organizational agility" OR "strategic agility") AND ("MSME" OR "SME" OR "small and medium enterprise") AND ("sustainability" OR "green economy" OR "sustainable development") AND "Indonesia" Secondary Search Strings (to capture related dimensions): ("dynamic capabilities" OR "adaptive capability") AND ("MSME" OR "SME") AND ("eco-innovation" OR "green innovation") AND "Indonesia"; ("digital transformation" OR "technology adoption") AND ("MSME agility" OR "SME resilience") AND "sustainable development"; ("VUCA" OR "business resilience") AND ("MSME" OR "small business") AND

("environmental performance" OR "carbon emission"); ("SDG 8" OR "SDG 9" OR "SDG 13") AND ("MSME empowerment" OR "small business development") AND "Indonesia"

These keywords were selected to align with the study's focus on agility, sustainability, and the Indonesian MSME context, drawing from key references like Arno (2025) and Rawashdeh et al. (2024). Inclusion and Exclusion Criteria: Literature selection adhered to explicit criteria to ensure relevance and rigor. Included sources were: published between 2018 and 2025 to reflect recent developments in agility and sustainability, aligning with the timeframe of references like Bappenas (2025b) and Arno (2025). Empirical and theoretical studies, including peer-reviewed journal articles, books, and policy reports from credible institutions (e.g., Bappenas, OECD, World Bank, UNDP). Focused on Indonesia or comparable developing economies (e.g., ASEAN countries) to ensure contextual relevance, as suggested by the need for comparative studies in the original manuscript. Published in English to align with the majority of cited works (e.g., Teece et al., 2016; OECD, 2019).

Excluded sources included, studies published before 2018, unless foundational (e.g., Bocken et al., 2014), to prioritize recent insights. Non-peer-reviewed sources lacking methodological rigor, such as opinion pieces or unverified reports. Studies unrelated to MSMEs, agility, or sustainability, or those focusing solely on large firms without relevance to the MSME context. The literature search process is summarized in Table 1, which outlines the stages of identification, screening, and inclusion to ensure transparency and methodological rigor.

Table 1. Summary of literature selection process

Stage	Description	Number of Sources
Identification	Initial search in Google Scholar and Bappenas repositories using keywords: "business agility MSME Indonesia," "green economy transition," "SDGs empowerment," "dynamic capabilities SME," "organizational agility SME," "eco-innovation MSME Indonesia," "digital transformation MSME sustainability," "VUCA environment MSME."	350
Screening	Removal of duplicates and sources not meeting inclusion criteria (2018–2025, relevant to MSMEs/agility/sustainability, English, credible institutions).	180
Eligibility	Full-text review for methodological rigor, contextual relevance (Indonesia/developing economies), and alignment with study objectives. Excluded non-rigorous or irrelevant sources.	75
Included	Final sources selected for synthesis, including peer-reviewed articles, policy reports, and foundational works.	50

2.3 Analytical framework

Analysis employed thematic synthesis, categorizing data into three dimensions: firm-level (e.g., innovation, eco-innovation adoption), network-level (e.g., collaborative ecosystems, green startups), and institutional-level (e.g., policy frameworks, financing mechanisms), grounded in dynamic capabilities theory (Teece et al., 2016). Data evaluation prioritized credibility, relevance, and methodological soundness, with higher weight given to empirical surveys, such as the Bappenas (2025b) white paper, due to its comprehensive diagnostic data on MSME green adoption, emissions estimates (216 million tons CO_2 annually), and surveys of environmental awareness across Indonesian provinces.

To ensure quality, sources were assessed using a structured evaluation framework. Credibility, preference was given to sources from reputable institutions (e.g., Bappenas, OECD) and peer-reviewed journals (e.g., Rawashdeh et al., 2024; Arno, 2025) with clear authorship and institutional backing. Relevance, sources were selected for their focus on MSME agility, sustainability, or green economy transitions, particularly in Indonesia or developing economies. For example, Bappenas (2025b) was prioritized for its contextual data on MSME emissions and financing gaps. Methodological soundness, empirical studies

with robust methodologies (e.g., surveys, case studies) were weighted higher than purely theoretical works, though foundational theories (e.g., Teece et al., 2016) were included for conceptual grounding. This framework ensured that selected sources provided reliable and contextually relevant insights, with policy reports like Bappenas (2025b) offering critical secondary qualitative data on Indonesia-specific challenges, such as low ISO 14001 certification rates and regional disparities in green adoption.

2.4 Data interpretation and synthesis

Interpretation involved iterative grouping of excerpts from sources (e.g., low green adoption rates linked to agility mechanisms) to construct a conceptual model integrating firm, network, and institutional dimensions. Biases in secondary data, such as potential optimism in policy reports (e.g., Bappenas, 2025b) or self-reported survey limitations in MSME data, were mitigated through triangulation with critical academic perspectives (e.g., OECD, 2019) and peer-reviewed empirical studies (e.g., Rawashdeh et al., 2024; Ali et al., 2023). Cross-referencing ensured that findings were robust, with academic studies validating policy data and vice versa. For instance, OECD's (2019) critique of institutional barriers complemented Bappenas' (2025b) data on financing shortfalls, providing a balanced synthesis.

2.5 Validity and limitations

Validity was ensured through reproducibility, triangulation with multiple sources, and alignment with Indonesia's national agenda (National Medium-Term Development Plan/*Rencana Pembangunan Jangka Menengah Nasional (RPJMN*) 2025–2045). The use of established databases and rigorous inclusion criteria further supported reliability. Limitations include reliance on secondary data, which may carry biases from original reporting, and the Indonesia-specific focus, which may limit generalizability. Future research could incorporate primary data or comparative studies with other ASEAN countries to address these gaps. Figure 2 illustrates the research framework, depicting the interplay of firm, network, and institutional dimensions in MSME agility and SDGs integration.

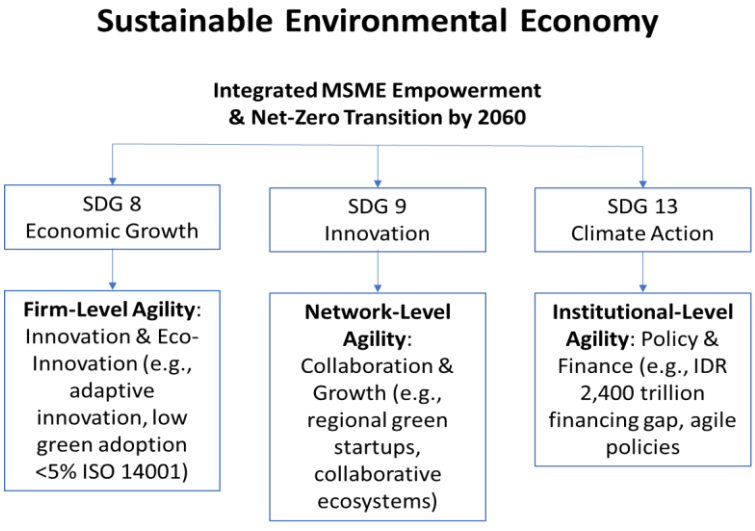

Fig. 2. Research framework for MSME agility and SDGs integration

3. Results and Discussion

This section presents the findings from the integrative literature review (ILR), synthesizing secondary qualitative data from the Bappenas (2025b) white paper Unveiling

the Future of Sustainable Business through Empowering Green MSMEs, supplemented by peer-reviewed studies and international reports (e.g., OECD, 2019; World Bank, 2023; UNDP, 2025). The analysis is structured around the thematic dimensions outlined in the research framework (Fig. 2): firm-level (innovation and eco-innovation), network-level (collaborative ecosystems), and institutional-level (policy and financing mechanisms). These dimensions are explored to understand how business agility enables MSMEs to address environmental and market challenges, align with SDGs 8, 9, and 13, and contribute to Indonesia's environmental economy. The discussion integrates comparisons with recent studies (e.g., Arno, 2025; Rawashdeh et al., 2024) to highlight contextual differences, regional disparities, and theoretical advancements, while addressing data limitations through triangulation.

3.1 The Nexus between business agility and sustainable MSME Empowerment

Data from Bappenas (2025b) reveals significant gaps in MSME green adoption: fewer than 5% of MSMEs hold ISO 14001 certifications, and only 26% of micro firms implement formal green processes, as illustrated in Figure 3 and Figure 4. A 2023 survey across 10 Indonesian provinces indicates sectoral variations, with manufacturing and agriculture showing particularly low readiness for sustainable practices. Medium enterprises demonstrate higher awareness of environmental regulations but lag in implementation, with only 24% engaging in sustainable energy programs (Fig. 5). These findings underscore the limited capacity of MSMEs to adopt green practices, despite their economic significance, contributing 61% to GDP and 97% to employment (Kemenko Perekonomian, 2025).

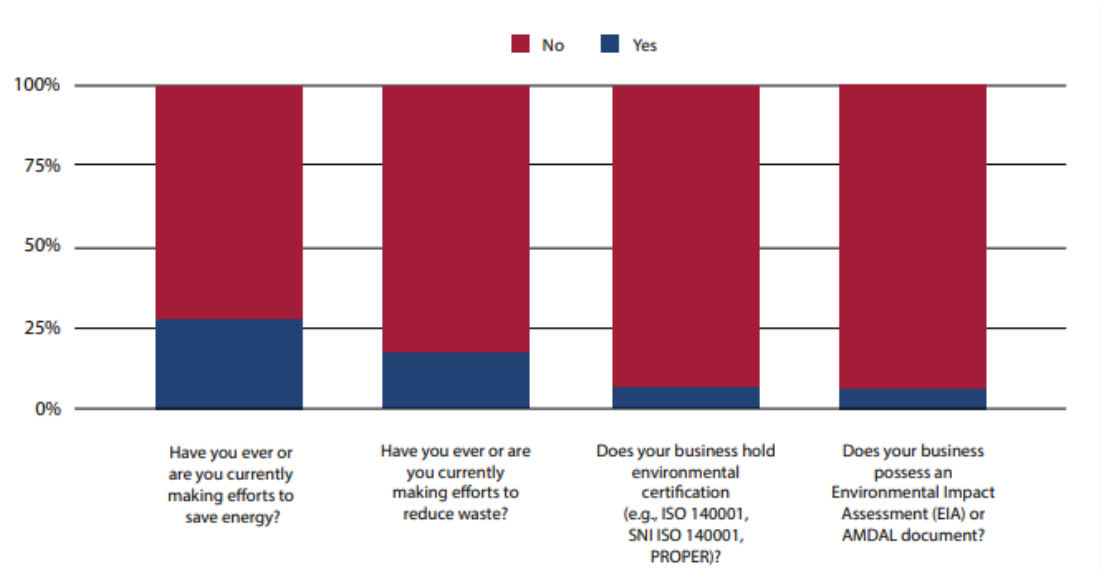

Fig. 3. Distribution of environmental certification ownership by enterprise size category (Bappenas, 2025b)

Business agility, defined as the ability to sense, seize, and transform in response to environmental and market changes (Teece et al., 2016), emerges as a critical mechanism for MSME empowerment. At the firm-level, agility manifests through adaptive innovation, enabling MSMEs to respond to green market opportunities, such as the EU Carbon Border Adjustment Mechanism (CBAM). For instance, agile MSMEs in manufacturing adopt waste management systems or renewable energy, aligning with SDG 8 (job creation through sustainable entrepreneurship) and SDG 13 (climate action via emissions reduction). However, compared to Rawashdeh et al. (2024), who found that strategic agility in Jordanian manufacturing SMEs is partially mediated by digital transformation, Indonesian MSMEs face significant barriers, with only 16% adopting meaningful digital technologies (Bappenas, 2025b). This suggests that digital transformation's role as a mediator of agility

may be weaker in Indonesia due to low technological literacy and infrastructure gaps, particularly in agriculture and micro firms.

Arno (2025) identifies nine dimensions of SME agility, including operational flexibility, team and case management, and strategic business agility. These dimensions can be mapped onto Indonesian MSMEs, where firm-level agility is evident in adaptive innovation (e.g., adopting upcycling in food and beverage sectors), but operational flexibility is constrained by resource limitations. For example, micro firms, which dominate Indonesia's MSME landscape, struggle with rapid decision-making due to limited access to capital and knowledge, unlike medium enterprises that show higher strategic sensitivity (Bappenas, 2025b). This aligns with Liu & Yang (2019), who note that agility drives eco-innovation in SMEs, but the Indonesian context highlights unique challenges, such as sectoral disparities, with agriculture lagging due to low environmental awareness.

At the network-level, agility is demonstrated through collaborative ecosystems, such as partnerships with green startups. Bappenas (2025b) reports 38 cleantech startups in West Java and 25 in East Java, which facilitate decarbonization efforts through knowledge-sharing and green value chains. These collaborations align with SDG 9 (innovation and infrastructure) by fostering eco-innovation and stakeholder engagement. Compared to Arno's (2025) emphasis on team and case management as agility enablers, Indonesian MSMEs leverage network-level agility to overcome resource constraints, as seen in partnerships like PT Wasteforchange with South Korean firms for waste solutions. However, regional disparities persist: South Sulawesi reports a 74% lack of green processes, contrasting with West Java's startup growth, indicating uneven readiness that agility must address (Bappenas, 2025b; Arifah et al., 2024).

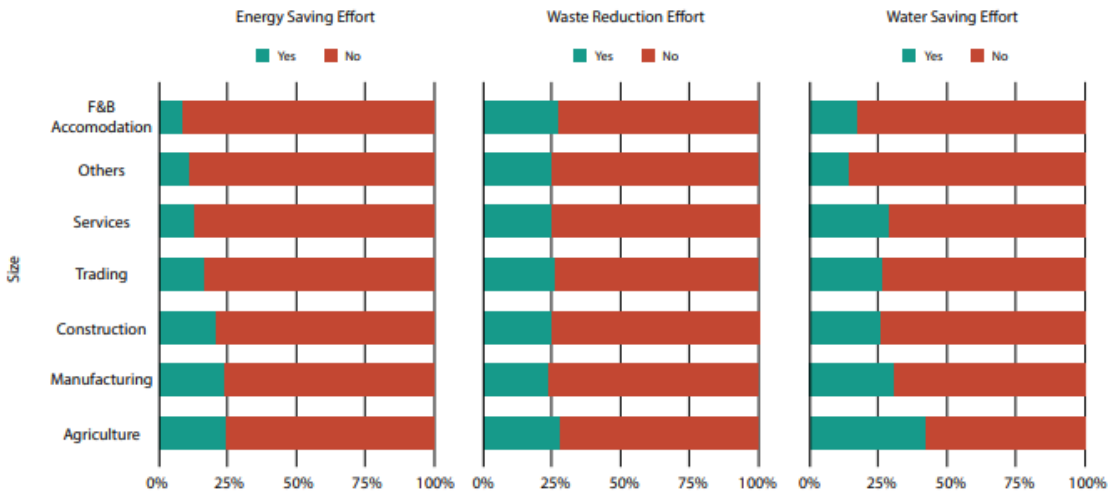

Fig. 4. Sectoral distribution of environmental efforts in energy, waste, and water management (Bappenas, 2025b)

This nexus is evident in the white paper's emphasis on MSMEs as catalysts for low-carbon transformation. Agility enables MSMEs to sense opportunities in emerging green markets, such as those driven by the EU's Carbon Border Adjustment Mechanism (CBAM) and domestic initiatives like P4G. For instance, green startups in West Java (38) and East Java (25) focus on decarbonizing transport and waste management through collaborative innovations. Yet, challenges like limited technical knowledge and high perceived risks hinder adaptability. The findings suggest that firm-level agility—through adaptive innovation and resource flexibility—can empower MSMEs to integrate sustainability, reducing their estimated 216 million tons of annual CO_2 emissions (equivalent to two-thirds of industrial emissions). This aligns with SDG 8 by fostering decent work in green sectors and SDG 13 by enhancing climate resilience, positioning agility as a bridge from survival to proactive empowerment.

3.2 Environmental economics perspective: linking agility and eco-innovation

MSMEs contribute 216 million tons of CO_2 annually, yet only 24% express high interest in sustainable energy programs, as shown in Figure 5 (Bappenas, 2025b). Partnerships, such as PT Wasteforchange's collaboration with international firms, demonstrate agility in adopting waste-to-resource solutions, aligning with circular economy principles. However, the financing shortfall of IDR 2,400 trillion by 2026 remains a significant barrier to scaling eco-innovation (Bappenas, 2025b).

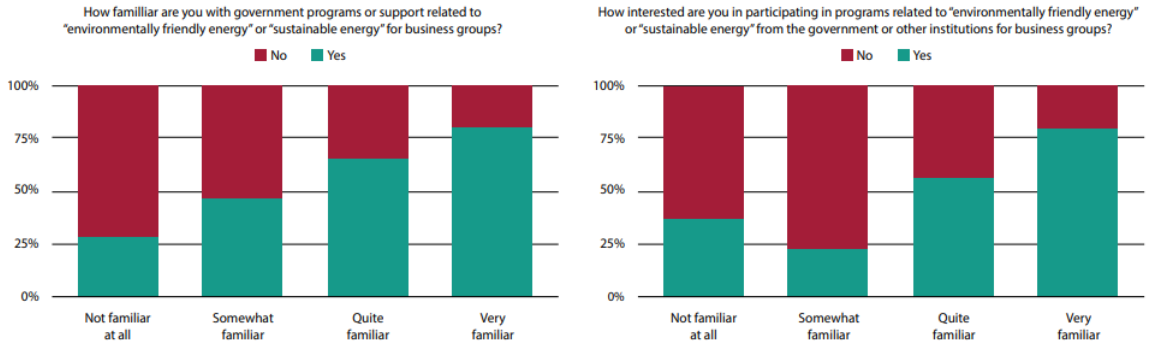

Fig. 5. Familiarity and interest in government or institutional programs on environmentally friendly or sustainable energy
(Bappenas, 2025b)

The environmental economy emphasizes economic growth decoupled from ecological harm, with circular models minimizing waste and maximizing resource efficiency (OECD, 2019; Bappenas, 2024). Agility enables MSMEs to adopt eco-innovative practices, such as upcycling or renewable energy, aligning with SDG 9 (industry and innovation) and SDG 12 (responsible consumption and production). Unlike Bocken et al. (2014), who focus on circularity in large firms, this study highlights how MSMEs leverage agility for lifecycle extension, as seen in food and beverage firms adopting biodegradable packaging (Bappenas, 2025b). Rawashdeh et al. (2024) argue that digital transformation mediates agility's impact on sustainability, but in Indonesia, the low adoption of digital tools (16%) limits this mediation, necessitating alternative agility enablers like collaborative networks.

Arno's (2025) framework of strategic business agility is particularly relevant here, as MSMEs in Indonesia's manufacturing sector show potential for eco-innovation but are hindered by financing and technical knowledge gaps. For instance, Bappenas (2025b) notes that only 26% of micro firms implement formal green processes, reflecting limited operational flexibility compared to Arno's agile SMEs. Regional hubs, such as those in West Java, could enhance ecosystem learning, as supported by Rawashdeh et al. (2024), who emphasize the role of knowledge deftness in sustainability transitions. These hubs could bridge disparities, such as South Sulawesi's low readiness, by fostering cross-sectoral collaboration and technology transfer, aligning with SDG 13's focus on climate action.

3.3 Institutional and policy enablers

Bappenas identifies gaps in national green standards and ESG reporting, with programs like ANGIN's Wirausaha Hijau supporting capacity but lacking scalability. The projected financing shortfall of IDR 2,400 trillion by 2026 underscores the need for adaptive policies (Bappenas, 2025b). Institutional-level agility, such as adaptive policies (e.g., green tax allowances), is critical for enabling MSME transitions, aligning with SDG 9's focus on resilient infrastructure. Compared to Germany's KfW program, which OECD (2019) highlights as a model for green financing, Indonesia's policies require phased roadmaps to scale MSME support, as suggested by Bappenas (2025b). Arno's (2025) dimension of strategic business agility can be applied to institutional contexts, where policy adaptability

enables MSMEs to access green markets. However, fragmented ESG reporting and limited national standards hinder progress, particularly for micro firms (INDEF, 2024). Triangulating Bappenas (2025b) with OECD (2019) reveals that institutional barriers, such as bureaucratic inefficiencies, exacerbate financing gaps, necessitating agility-oriented interventions like public-private partnerships.

3.4 Integrative insights and conceptual model

The synthesis reveals that business agility operates across firm, network, and institutional levels, with opportunities in green markets (e.g., EU CBAM) and partnerships (e.g., 38 green startups in West Java). The proposed model integrates these dimensions to position MSMEs as agents of Indonesia's net-zero transition by 2060 (Bappenas, 2025a). The conceptual model extends dynamic capabilities theory (Teece et al., 2016) by linking agility to environmental outcomes, contrasting with Arno (2025), who focuses on general SME agility. Firm-level agility drives eco-innovation, as seen in manufacturing MSMEs adopting renewable energy, while network-level agility fosters collaborative decarbonization, as evidenced by startup ecosystems in West Java (Bappenas, 2025b). Institutional-level agility, through policies like green tax incentives, addresses financing gaps, aligning with SDG 13. Compared to Rawashdeh et al. (2024), who emphasize digital transformation, this study highlights contextual enablers like regional hubs and policy adaptability, which are critical in Indonesia's resource-constrained MSME landscape.

Regional disparities, such as South Sulawesi's 74% lack of green processes versus West Java's startup growth, underscore the need for tailored agility strategies (Arifah et al., 2024). For instance, agriculture MSMEs require capacity-building to enhance operational flexibility, while manufacturing firms benefit from digital tools, though adoption remains low (Bappenas, 2025b). The model also addresses SDG 8 by promoting inclusive growth through job creation in green sectors, aligning with Chung et al. (2019), who link agility to knowledge creation and competitiveness.

Table 2. Summary of key findings across sources

Dimension	Bappenas (2025b)	OECD (2019)	World Bank (2023)	UNDP (2025)
MSME Contribution	Contributes 61% to GDP and 97% to employment	Emphasizes the need to strengthen SME entrepreneurship	Highlights MSMEs as the backbone of economic growth	Supports MSMEs through KUR (People's Business Credit) and digital payment systems
Financing Gap	Projects a financing shortfall of IDR 2,400 trillion by 2026	Identifies financing as a primary challenge for SMEs	Stresses the importance of enhancing MSME access to credit	Promotes financing through programs like SDG Venture Scaler
Environmental Impact	Estimates 216 million tons of CO_2 emissions annually	Reviews Indonesia's green growth policies	Notes the need for policy enablers to support green transitions	Leads low-carbon pathways, including initiatives like REDD+
Adoption of Green Practices	Less than 5% of MSMEs hold ISO 14001 certification	Advocates for incentives to promote sustainable practice adoption	Focuses on fiscal and financial policies to facilitate transitions	Supports capacity-building programs and green startup networks

3.5 Data limitations and mitigation

The reliance on secondary data, particularly from Bappenas (2025b), introduces potential limitations, such as biases in self-reported surveys. For example, the IESR survey cited in Bappenas (2025b) indicates high conceptual familiarity with green energy (e.g.,

24% interest in sustainable energy programs), but actual implementation remains low (<5% ISO 14001 certification), suggesting overreporting of awareness.

The use of secondary data, while comprehensive, carries risks of bias, particularly in self-reported surveys like those conducted by IESR for Bappenas (2025b). Self-reported data may inflate perceived awareness due to social desirability, as MSMEs may overstate familiarity with green concepts without translating this into practice. This is evident in the gap between reported interest (24%) and actual adoption (5%), highlighting the need for agility to bridge conceptual understanding and practical implementation (Teece et al., 2016). To mitigate these biases, the study triangulates Bappenas data with critical academic perspectives (e.g., OECD, 2019) and peer-reviewed studies (e.g., Rawashdeh et al., 2024; Ali et al., 2023). For instance, OECD's (2019) critique of institutional barriers validates Bappenas' findings on financing gaps, while Rawashdeh et al. (2024) provide empirical support for agility's role in eco-innovation, ensuring a balanced synthesis.

This triangulation strengthens the study's robustness by cross-referencing policy data with academic insights, addressing potential optimism in Bappenas (2025b) reports. For example, while Bappenas highlights green startup growth in West Java, OECD (2019) notes broader institutional challenges, such as fragmented ESG reporting, which contextualizes the scalability issue. The reliance on dynamic capabilities theory further mitigates bias by framing low adoption rates as a lack of strategic sensitivity, which agility can address through adaptive innovation and policy enablers (Teece et al., 2016; Arno, 2025). Future studies could incorporate primary data, such as interviews with MSME owners, to validate secondary findings and further reduce self-reporting biases.

3.6 Synthesis and contribution to SDGs

The findings synthesize how business agility enables MSMEs to contribute to Indonesia's environmental economy and SDGs. At the firm-level, agility drives eco-innovation, such as adopting renewable energy, though limited by low digital transformation (16%) and technical knowledge gaps (Bappenas, 2025b). Network-level agility fosters collaborative ecosystems, as seen in West Java's 38 cleantech startups, supporting SDG 9 through innovation and SDG 13 through decarbonization. Institutional-level agility, via adaptive policies, addresses financing gaps, aligning with SDG 8's focus on inclusive growth. Compared to Arno (2025), this study uniquely integrates Indonesia-specific data, emphasizing regional disparities (e.g., South Sulawesi's 74% lack of green processes) and contextual enablers like regional hubs.

Table 3. Distribution of MSME Respondents by Sector and Province in the 2023 Green and Sustainability Awareness Survey

Sectors /Province	Trading	Agriculture	Service	Food and Beverage Accommodation Provider	Manufacture	Construction	Others	Total
South Sumatera	10	16	1	66	4	5	7	49
North Sumatera	22	11	10	9	15	4	1	72
West Sumatera	12	14	1	-	5	0	5	37
Jakarta	22	-	8	6	18	11	20	85
Banten	4	4	4	-	46	7	6	67
West Java	58	14	16	32	63	18	3	204
East Java	45	27	11	17	28	6	23	157
Central Java	11	3	47	124	13	45	6	249
West Nusa Tenggara	5	5	-	6	2	11	28	47
South Sulawesi	11	10	2	-	6	3	1	33
Total	200	100	100	200	200	100	100	1000

(Bappenas, 2025b)

The proposed model advances dynamic capabilities theory by linking agility to environmental outcomes, offering a multidimensional framework that contrasts with Rawashdeh et al.'s (2024) focus on digital mediation. This framework positions MSMEs as key agents in Indonesia's net-zero transition by 2060, addressing gaps in eco-innovation, financing, and policy adaptability. By triangulating Bappenas (2025b) with OECD (2019), World Bank (2023), and UNDP (2025), the study provides actionable insights for policymakers, such as scaling green financing and capacity-building hubs to enhance MSME agility and SDG integration. A preliminary survey was conducted in 2023 to analyze the energy and environmental potential of Indonesian MSMEs. The survey covered the top 10 provinces in Indonesia in terms of the number of SMEs (Ministry of Cooperatives and SMEs of Indonesia, 2022) which are as follows in table 3. The distribution of enterprises by scale is as follows in table 4. The allocation of samples per sector was based on the proportional distribution derived from Bank Indonesia's data on MSME loan disbursement by sector.

Table 4. Distribution of MSMEs by Size Category and Province in Indonesia

Provinces	Micro	Small	Medium	Total
South Sumatera	25	17	7	49
North Sumatera	36	25	11	72
West Sumatera	19	13	5	37
Jakarta	42	30	13	85
Banten	34	23	10	67
West Java	102	72	30	204
East Java	78	55	24	157
Central Java	125	87	37	249
West Nusa Tenggara	23	16	8	47
South Sulawesi	16	12	5	33
Total	500	350	150	1000

(Bappenas, 2025b)

4. Conclusions

This integrative literature review set out to answer three research questions examining how business agility enables Indonesian MSMEs to contribute to the environmental economy and align with SDGs 8, 9, and 13. By synthesizing data from Bappenas (2025b), peer-reviewed studies, and international reports (OECD, 2019; World Bank, 2023; UNDP, 2025), the study reveals that agility operates across firm, network, and institutional levels to address critical challenges. Addressing RQ1, firm-level agility manifests through eco-innovation, such as renewable energy adoption, enabling MSMEs to sense and respond to environmental shifts. Responding to RQ2, key enablers include collaborative ecosystems—exemplified by West Java's 38 cleantech startups—while primary barriers persist as financing gaps (IDR 2,400 trillion shortfall by 2026) and limited digital transformation (16% adoption rate). Answering RQ3, the multidimensional framework demonstrates how micro-level agile practices can be scaled through institutional interventions, such as adaptive green tax policies, to bridge the gap between individual MSME actions and Indonesia's net-zero by 2060 target. However, regional disparities, such as South Sulawesi's 74% lack of green processes, underscore the need for tailored strategies. The following sections elaborate on these findings and their implications for policy and practice.

Theoretically, the proposed multidimensional model extends dynamic capabilities theory (Teece et al., 2016) by linking agility to environmental outcomes, contrasting with Arno's (2025) general SME focus by emphasizing Indonesia-specific challenges like sectoral variations and financing barriers. Practically, the findings inform Indonesia's RPJMN 2025–2029 by recommending: national green standards to unify ESG reporting, inancial incentives to address the IDR 2,400 trillion gap, capacity-building hubs to enhance technical knowledge, stakeholder collaborations to scale green startups, and data-driven monitoring

to track MSME transitions. These interventions strengthen MSMEs' role in achieving net-zero by 2060, fostering inclusive growth (SDG 8).

Limitations, such as biases in self-reported Bappenas (2025b) data, were mitigated through triangulation with critical sources (OECD, 2019; Rawashdeh et al., 2024), ensuring robust findings. Future research should incorporate primary data and ASEAN-comparative studies to enhance generalizability. By positioning MSMEs as agents of sustainable transformation, this study underscores agility's role in bridging micro-level practices with macro-level environmental goals, offering a pathway for inclusive, resilient, and sustainable economic development in Indonesia.

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Conflicts of Interest
The author declares no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Declaration of Generative AI Use
During the preparation of this work, the author used Grok (developed by xAI) and NotebookLM to assist in synthesizing literature, drafting sections, and refining academic tone. After using these tools, the author reviewed and edited the content as needed and took full responsibility for the content of the publication.

References

Ali, P. R., Machfud, M., Sukardi, S., Noor, E., & Purnomo, D. (2023). Indonesian agroindustry business agility: Enablers and challenges in the poultry industry based on ISM model. *Heliyon, 9*, e16808. https://doi.org/10.1016/j.heliyon.2023.e16808

Al-Shaer, H., Liu, Y. S., & Albitar, K. (2023). Driving businesses towards a better climate: Macro and micro mechanisms to protect the planet. *Business Strategy and the Environment, 33*(3), 1810–1833. https://doi.org/10.1002/bse.3575

Arno, P. (2025). SME business agility framework: A comprehensive review of capabilities, dimensions, and enablers. *IEEE Access.* https://doi.org/10.1109/ACCESS.2025.3572526

Bappenas. (2024). *Peta jalan & rencana aksi nasional ekonomi sirkular Indonesia 2025–2045.* Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (Bappenas).

Bappenas. (2025a). *Rencana pembangunan jangka menengah nasional (RPJMN) 2025–2029: Perekonomian hijau dan inklusif.* Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (Bappenas).

Bappenas. (2025b). *White paper: Unveiling the future of sustainable business through empowering green MSMEs.* Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (Bappenas).

Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production, 65*(2), 42–56. https://doi.org/10.1016/j.jclepro.2013.11.039

Chung, T. T. R., Liang, T. P., Peng, C. H., & Chen, D. N. (2019). Knowledge creation and organizational performance: Moderating and mediating processes from an organizational agility perspective. *AIS Transactions on Human-Computer Interaction, 11*(2), 79–106. https://doi.org/10.17705/1thci.00114

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147–160. https://doi.org/10.2307/2095101

Doz, Y. L. (2020). Fostering strategic agility: How individual executives and human resource practices contribute. *Human Resource Management Review, 30*(1), 100693. https://doi.org/10.1016/j.hrmr.2019.100693

Doz, Y. L., & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning, 43*, 370–382. https://doi.org/10.1016/j.lrp.2009.07.006

Hamieddine, C., & Akioud, M. (2025). Agility for resilience: A qualitative exploration of companies' strategies in a volatile, uncertain, complex, and ambiguous environment. *Corporate & Business Strategy Review, 6*(2), 111–119. https://doi.org/10.22495/cbsrv6i2art11

Institute for Development of Economics and Finance (INDEF). (2024). *Peran platform digital terhadap pengembangan UMKM di Indonesia.* Institute for Development of Economics and Finance.

Kementerian Koordinator Bidang Perekonomian Republik Indonesia (Kemenko Perekonomian). (2025). *Pemerintah dorong UMKM naik kelas, tingkatkan kontribusi terhadap ekspor Indonesia* [Press release]. Kementerian Koordinator Bidang Perekonomian Republik Indonesia.

Kwasek, A., Kocot, M., Rodowicki, S., Kandefer, K., Szymanska, M., Sobon, D., & Trzaskowska-Dmoch, A. (2025). The impact of organizational agility on the sustainable development of the organization in the context of Economy 5.0. *Sustainability, 17*(15), 6907. https://doi.org/10.3390/su17156907

Liu, H. M., & Yang, H. F. (2019). Network resource meets organizational agility: Creating an idiosyncratic competitive advantage for SMEs. *Management Decision, 58*(10), 2153–2171. https://doi.org/10.1108/MD-10-2017-1061

New Energy Nexus Indonesia. (2024). *Policy guideline: Ekosistem startup cleantech di tingkat nasional dan subnasional.* New Energy Nexus Indonesia. (2024).

Organisation for Economic Co-operation and Development (OECD). (2019). *OECD green growth policy review of Indonesia 2019.* OECD Environmental Performance Reviews. https://doi.org/10.1787/1eee39bc-en

Oermann, M. H., & Knafl, K. A. (2021). Strategies for completing a successful integrative review. *Nurse Author & Editor, 31*(3–4), 65–68. https://doi.org/10.1111/nae2.30

Overby, E., Bharadwaj, A., & Sambamurthy, V. (2006). Enterprise agility and the enabling role of information technology. *European Journal of Information Systems, 15*(2), 120–131. https://doi.org/10.1057/palgrave.ejis.3000600

Rawashdeh, A., Abdallah, A. B., Alfawaeer, M., Al Dweiri, M., & Al-Jaghbeer, F. (2024). The impact of strategic agility on environmental sustainability: The mediating role of digital transformation. *Sustainability, 16*(3), 1338. https://doi.org/10.3390/su16031338

Rigby, D. K., Sutherland, J., & Noble, A. (2018). Agile at scale. *Harvard Business Review, 96*(3), 88–96. https://hbr.org/2018/05/agile-at-scale

Sivaiah, P., & Vinodan, A. (2025). Framework for sustainable SME management: Integrating innovation, technology, and circular economy approach. *Small Enterprise Research, 32*(1), 26–49. https://doi.org/10.1080/13215906.2025.2513262

Spence, M., Gherib, J. B. B., & Biwole, V. M. O. (2008). A framework of SMEs' strategic involvement in sustainable development. In *Sustainable innovation and entrepreneurship* (pp. 49–70). Edward Elgar. https://doi.org/10.4337/9781848441552.00010

Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *The Journal of Strategic Information Systems, 28*(2), 218–237. https://doi.org/10.1016/j.jsis.2018.12.002

Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review, 58*(4), 13–35. https://doi.org/10.1525/cmr.2016.58.4.13

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356–367. https://doi.org/10.1177/1534484305278283

United Nations Department of Economic and Social Affairs (UNDESA). (2020). *Micro-, small and medium-sized enterprises (MSMEs) and their role in achieving the Sustainable Development Goals.* United Nations Department of Economic and Social Affairs.

United Nations Development Programme (UNDP). (2025). *Annual report 2024.* UNDP Indonesia.

United Nations (UN). (2021). *The Sustainable Development Goals report 2021.* United Nations

World Bank. (2023). *Indonesia economic prospects.* World Bank Group.

Yusuf, M., Surya, B., Menne, F., Ruslan, M., Suriani, S., & Iskandar, I. (2023). Business agility and competitive advantage of SMEs in Makassar City, Indonesia. *Sustainability, 15*(1), 627. https://doi.org/10.3390/su15010627

Zahoor, N., Golgeci, I., Haapanen, L., Ali, I., & Arslan, A. (2022). The role of dynamic capabilities and strategic agility of B2B high-tech small and medium-sized enterprises during COVID-19 pandemic: Exploratory case studies from Finland. *Industrial*

Marketing Management, 105, 502–514. https://doi.org/10.1016/j.indmarman.2022.07.006

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