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Research Paper

Unravelling the Entrepreneurial Ecosystem: Actors and Factors Shaping Agricultural MSMEs in Indonesia

Ahmad Zaki*, Satrio Tegar Gunung Koraag, Mawar Kusumawardhani
Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia

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Abstract

Agricultural micro, small, and medium enterprises (MSMEs) play a vital role in Indonesia's rural economy and food security, yet they face persistent structural challenges, including limited access to finance, weak infrastructure, and fragmented policy support. These constraints hinder their growth and resilience, particularly in rural areas. This study aims to examine the key actors and contextual factors shaping the entrepreneurial ecosystem (EE) of agricultural MSMEs in Indonesia, in order to identify strategic interventions that support sustainable and inclusive development. Using a qualitative approach, this research synthesizes data from peer-reviewed literature, official reports, and credible digital sources. The analysis is guided by the entrepreneurial ecosystem framework and network theory, applying thematic analysis to uncover actor-factor dynamics. The findings reveal a vibrant but uneven ecosystem, where strong local networks and community-market linkages are offset by low digital adoption, weak government engagement, and insufficient financial access. Infrastructure gaps and limited entrepreneurial literacy further constrain innovation and competitiveness. The study makes a conceptual contribution by contextualizing EE frameworks within Indonesian agriculture and integrating sustainability and inclusivity dimensions. Practically, it proposes policy reform, targeted digital inclusion, and rural infrastructure enhancement to empower women, youth, and smallholder entrepreneurs.

Keywords *Entrepreneurial Ecosystem, Agriculture, MSMEs, Rural Development*

INTRODUCTION

The agricultural sector is a cornerstone of Indonesia's economy, contributing significantly to employment, food security, and rural development, with over 13% of the national GDP derived from agriculture (Mukti et al., 2024a). Agricultural micro, small, and medium enterprises (MSMEs), often family-run and small-scale, employ millions in rural areas and drive activities such as farming, agro-processing, and value-added products. However, these enterprises face substantial challenges, including limited access to capital, technology, and markets, which are compounded by structural issues such as low productivity, fluctuating commodity prices, and seasonal variability (Mukti et al., 2024a; Purwantini & Sunarsih, 2019). These barriers, along with pest outbreaks and market volatility, hinder their growth, competitiveness, and contribution to export revenues compared to manufacturing counterparts (Saragih, 2018). The entrepreneurial ecosystem (EE) framework offers a lens for understanding how interconnected actors and factors foster or impede entrepreneurship in agriculture, particularly for MSMEs (Isenberg, 2011; Stam & Spigel, 2016). By unravelling these dynamics, this study aims to identify key actors, factors, and their interactions to enhance the resilience and sustainability of Indonesia's agricultural MSMEs, informing policies for inclusive economic progress (Acs et al., 2017).

Indonesia's agricultural MSMEs operate within a complex socio-economic landscape shaped by diverse stakeholders, including farmers, government institutions, universities, private

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Corresponding author's email: ahmad.zaki@upnyk.ac.id
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industries, financial institutions, and community networks. The quadruple helix model, emphasizing collaboration among these actors, is pivotal for strengthening the ecosystem, yet coordination and program sustainability remain limited (Mukti et al., 2025). The EE framework, rooted in systems and network theory, views ecosystems as networks where actors, such as business owners, communities, markets, and governments, interact to drive innovation and economic value (Burt, 1992; Stam & Spigel, 2016). In Indonesia, regions like East Java, Central Java, and Sumatra host dense MSME clusters in rice, horticulture, and palm oil production, benefiting from local cooperatives but facing land scarcity and infrastructure deficits.

Both internal and external factors influence the entrepreneurial ecosystem. Internal factors include farmers' entrepreneurial capacity, such as their ability to innovate, take risks, and manage resources, which is often limited by low entrepreneurial literacy (Mukti et al., 2024b; Anwarudin et al., 2020). External factors encompass policy, finance, human capital, market conditions, infrastructure, and sustainability orientation, forming the abiotic environment that influences actor interactions (Stam, 2015). Government policies, such as subsidies for organic farming or smart farming 4.0 initiatives, are critical but often lack integration, with only 25% of subsidies reaching rural farmers (Rivai & Anugrah, 2011; Rachmawati, 2020). Financial constraints, with only 32% of MSMEs accessing formal credit, restrict investments in technology and market expansion (Saragih, 2018). Human capital deficits, including low digital literacy and inadequate entrepreneurial education, hinder the adoption of innovation (Jan et al., 2025; Ningsih et al., 2021).

Market volatility, with 65% of farmers reporting income instability, underscores the need for models like community-supported agriculture (CSA) to stabilize incomes, though scalability is limited by logistical challenges and low consumer awareness (Saragih, 2018; Sulistyowati et al., 2023). Infrastructure shortcomings, such as poor irrigation and rural roads, increase post-harvest losses, while the adoption of technology, including drones and sensors, is hindered by high costs and a lack of skills, with only 10% of small-scale farmers adopting smart farming (Rachmawati, 2020; Abate & Sheferaw, 2023). Sustainability factors, including climate adaptation and organic farming, are critical but face barriers in knowledge and cost (Purwantini & Sunarsih, 2019; Rozci, 2021). These factors interact dynamically, with network theory highlighting how strong ties enhance knowledge flows and ecosystem resilience (Burt, 1992).

A pressing challenge is the declining interest of millennials in agricultural entrepreneurship, with 70% deterred by perceptions of low profitability, labor-intensive practices, and agriculture's low social status (Prastiyanto et al., 2022). Digitalization programs and entrepreneurship courses, such as those in Bogor, show potential to attract youth but face low awareness and accessibility (Ningsih et al., 2021). Socio-cultural factors, including the risk aversion of rural communities and traditional gender norms, further discourage entrepreneurial activities, particularly among women, despite their significant role in rural economies (Pujiriyani, 2022; Dimick & Richard, 2025). Community-based initiatives, such as cooperatives and *gotong royong* (mutual cooperation), foster social capital but require modernization to align with market demands (Sulistyowati et al., 2023; Hasan et al., 2025). Climate change exacerbates vulnerabilities, with 50% of farmers reporting crop failures due to unpredictable weather, necessitating the adoption of climate-smart agriculture (Rozci, 2021). Digital platforms offer opportunities for market access and knowledge transfer; however, the digital divide, characterized by limited internet access and low digital literacy, restricts the benefits of these platforms for rural farmers (Fadilla et al., 2023; Munaiseche et al., 2022). Addressing these challenges requires a holistic ecosystem approach to build resilience and competitiveness (Benussi & Samoggia, 2025).

Comparative studies from developing nations provide insights into effective ecosystem models. Ethiopia's focus on academic linkages, Malaysia's integrated policies, and China's digital

agriculture initiatives highlight strategies to enhance actor coordination, policy alignment, and technology adoption (Abate & Sheferaw, 2023; Aziz et al., 2022; Hu, 2025). Indian models emphasize community-driven approaches, aligning with Indonesia's communal traditions, while African cases underscore gender inclusivity and NGO roles, relevant for Indonesia's female-dominated rural workforce (Rathore et al., 2023; Dimick & Richard, 2025). These comparisons reveal transferable elements to strengthen Indonesia's agricultural ecosystems, particularly in addressing regional disparities between Java and the outer islands (Badan Pusat Statistik, 2023). Literature gaps include the limited integration of analyses of actor-factor interactions, a focus on urban sectors, and underexplored regional and gender dynamics, which this study aims to address (Purbasari et al., 2018; Stam & Spigel, 2016).

LITERATURE REVIEW

Entrepreneurial Ecosystem

The entrepreneurial ecosystem (EE) represents a dynamic framework of interconnected actors and factors that foster productive entrepreneurship, innovation, and economic growth within a specific context (Purbasari et al., 2019). This concept emphasizes the interdependence of elements such as policy, finance, human capital, markets, and infrastructure, which collectively enable entrepreneurs to thrive while addressing local challenges like resource constraints in developing economies (Abate & Sheferaw, 2023). In emerging markets, EEs often reveal imbalances, where strong community networks compensate for weak institutional support, promoting knowledge transfer and resilience (Wube & Atwal, 2023). Network theory underpins this framework, highlighting how actor interactions—characterised by cohesion, heterogeneity, and frequency—facilitate value creation and innovation (Purbasari et al., 2018).

Agricultural MSMEs

Agricultural micro, small, and medium enterprises (MSMEs) embody a specialised subset of MSMEs, focusing on farming, agro-processing, and value-added activities that are essential for food security and rural livelihoods in developing nations (Hu, 2025; Hasan et al., 2025). These enterprises face unique vulnerabilities, including climate variability, supply chain disruptions, and limited technological access, yet they hold potential for sustainable innovation through knowledge-based entrepreneurship (Aliabadi et al., 2022; Lorenz et al., 2023). In contexts like Indonesia and the Philippines, agricultural MSMEs benefit from community-driven networks that facilitate traditional knowledge sharing, but gaps in formal support—such as extension services and incubation—hinder scalability (Purbasari et al., 2019; Lorenz et al., 2023).

RESEARCH METHOD

This study employs a qualitative design using a systematic literature review to examine the actors and factors influencing Indonesia's agricultural MSME ecosystem. Relevant literature was sourced from peer-reviewed journals, policy papers, government reports, and statistical data, selected based on topical relevance and credibility. A snowballing technique was used to identify additional studies. Thematic content analysis was applied, guided by Isenberg's Entrepreneurial Ecosystem Model and Burt's Network Theory. Coding combined deductive and inductive approaches: initial codes were drawn from theoretical constructs, then refined as new patterns emerged. Codes were organized into two domains: (1) key actors (e.g., government, finance, education, community), and (2) ecosystem factors (e.g., infrastructure, digital access, sustainability). To ensure rigor, data triangulation across diverse sources was conducted, and peer cross-checking improved coding reliability. An audit trail documented analytical decisions, and comparative insights from other developing contexts were integrated to strengthen interpretation.

FINDINGS AND DISCUSSION

Actors in the Entrepreneurial Ecosystem of Agricultural MSMEs

The entrepreneurial ecosystem for agricultural MSMEs in Indonesia comprises a diverse set of actors, including farmers, government institutions, financial institutions, educational and research institutions, market actors, support organizations, and community networks. These actors align with global EE frameworks and the quadruple helix model but exhibit unique characteristics due to Indonesia's agricultural and socio-economic context.

1. Farmers and MSME Owners

   Farmers and MSME owners are central actors, driving innovation, risk-taking, and sustainable practices (Hasan et al., 2025). Young and educated farmers demonstrate higher adaptability and entrepreneurial capacity, with programs like the Young Agricultural Entrepreneur Program (PWMP) at Padjadjaran University, enhancing competencies among 60% of participants (Mukti et al., 2018). However, many individuals face challenges such as low entrepreneurial literacy, limited market access, and gender biases, particularly for women and young people (Dimick & Richard, 2025). Their ability to adopt innovations, such as organic farming or digital tools, determines ecosystem vibrancy, with successful MSMEs leveraging community networks for resilience (Lorenz et al., 2023).

2. Government Institutions

   Government bodies, including the Ministry of Agriculture, the Ministry of Cooperatives and SMEs, and regional governments, shape the ecosystem through policies, subsidies, and extension services (Purbasari et al., 2019; Mukti et al., 2025). Initiatives like the One Village One Product program and village funds aim to support MSME growth, but bureaucratic delays and fragmented implementation limit their impact, with only 25% of subsidies reaching rural farmers (Rivai & Anugrah, 2011; Fkun et al., 2023). Extension services offer technical expertise, yet their reach is uneven, particularly in remote areas such as Papua. Coordination challenges and limited direct engagement with MSMEs further constrain their effectiveness (Abate & Sheferaw, 2023).

3. Financial Institutions

   Financial actors, including commercial banks, rural cooperatives, microfinance institutions, and fintech platforms, play a crucial role in providing capital (Munaiseche et al., 2022). However, only 32% of agricultural MSMEs access formal credit due to stringent collateral requirements and low financial literacy (Ogujiuba et al., 2023). Fintech innovations are emerging in Java but face adoption barriers in outer islands due to infrastructure deficits (Haqqi, 2021). Cooperatives offer alternative financing but often lack scalability, prompting entrepreneurs to turn to high-interest informal lending (Aziz et al., 2022).

4. Educational and Research Institutions

   Universities (e.g., Siliwangi University, Padjadjaran University) and research centers like the Indonesian Institute of Sciences (LIPI) foster innovation through agribusiness incubators, training programs, and technology development (Hasan et al., 2025). Programs like agrivarsity initiatives integrate entrepreneurship education with sustainable practices, but their impact is concentrated in urban areas, leaving rural MSMEs underserved (Rathore et al., 2023; Hu, 2025). These actors are pivotal for building human capital and digital literacy but require stronger rural linkages (Aliabadi et al., 2022).

5. Market Actors and Supply Chain Partners

   Market actors, including traders, distributors, cooperatives, and agribusiness corporations, shape demand, pricing, and distribution channels (Purbasari et al., 2019). Cooperatives in Java and Sumatra facilitate market access for products such as palm oil and coffee; however, smallholders face exploitation by middlemen, with 65% reporting income instability due to

price volatility (Saragih, 2018; Rahman et al., 2023). Digital platforms, such as e-commerce marketplaces, are emerging enablers; nonetheless, rural MSMEs lag in adoption due to the digital divide. Global demand for sustainable products drives diversification, but logistics barriers hinder export competitiveness (Benussi & Samoggia, 2025).

6. Support Organizations and NGOs

Support organizations, including farmer groups, incubators, and NGOs like Mercy Corps, contribute through capacity building, advocacy, and social entrepreneurship (Lorenz et al., 2023; Sulistyowati et al., 2023). Urban-based incubators offer mentoring and market linkages; however, only 15% of collaborative programs are sustained beyond their initial funding (Mukti et al., 2025; Aziz et al., 2022). Farmer groups foster peer learning, yet lack formal integration with broader ecosystems (Aliabadi et al., 2022). NGOs promote sustainable practices, such as agroforestry, but funding constraints limit their ability to reach a wider audience.

7. Community and Culture

Local communities and cultural factors significantly influence entrepreneurial attitudes, with traditions like *gotong royong* (mutual cooperation) fostering social capital and knowledge sharing (Chilita, 2024; Hasan et al., 2025). However, cultural perceptions of agriculture as a low-prestige profession deter 70% of millennials from entering the sector, and gender norms limit women's participation in formal networks (Prastiyanto et al., 2022; Dimick & Richard, 2025). Community-driven ecosystems foster resilience but require modernization to align with market demands.

Factors Shaping the Entrepreneurial Ecosystem

The ecosystem is shaped by enabling and constraining factors that interact with actors to influence the performance and sustainability of MSMEs. These factors reflect Indonesia's agricultural context and global EE trends.

1. Information and Knowledge Access

Access to information through extension services, digital platforms, and market data is critical for competitiveness (Purbasari et al., 2019). However, extension services are limited in remote areas, and digital platforms like weather forecasting apps face adoption barriers due to low digital literacy, with only 30% of field extension workers engaging with cyber extension (Fadilla et al., 2023; Jan et al., 2025). Market information on pricing and demand trends is often accessed through informal networks, highlighting gaps in dissemination (Rahman et al., 2023).

2. Entrepreneurial Literacy and Human Capital

Entrepreneurial literacy, encompassing sustainable agriculture and business skills, is a key determinant of MSME success (Hasan et al., 2025). Training programs have increased entrepreneurial intentions among students by 40%, but scalability is limited, and rural farmers face low literacy levels (Ningsih et al., 2021; Hu, 2025).

3. Financial Capital

Access to finance remains a significant barrier, with only 32% of MSMEs accessing formal credit, and government subsidies are often mismanaged (Fkun et al., 2023). Fintech solutions are nascent in rural areas, and informal lending undermines sustainability (Munaiseche et al., 2022). Inclusive financing models, such as cooperative-led microfinance, can enhance resilience (Aziz et al., 2022).

4. Support Services and Incubation

Business development services and incubators support the growth of MSMEs; however, their urban bias and insufficient funding (with 80% of incubators reporting shortages) limit their impact in rural areas (Lorenz et al., 2023). Farmer groups act as informal networks but lack integration with formal incubators (Aliabadi et al., 2022).

5. Infrastructure and Technology

Infrastructure deficits in irrigation, roads, and digital connectivity lead to increased post-harvest losses and limit productivity (Ministry of Agriculture Indonesia, 2024; Jan et al., 2025). Smart farming technologies, such as drones and sensors, are adopted by fewer than 10% of small-scale farmers due to high costs and low digital literacy (Rachmawati, 2020; Munaiseche et al., 2022). Tailored solutions are needed to enhance technology adoption (Benussi & Samoggia, 2025).

6. Social and Cultural Factors

Communal traditions foster collaboration, but risk aversion and low societal prestige for agriculture discourage youth participation, with 70% of millennials viewing the sector as unappealing (Chilita, 2024; Prastiyanto et al., 2022). Gender norms limit women's access to resources, despite their contributions (Dimick & Richard, 2025). Cultural shifts are needed to enhance entrepreneurial motivation.

7. Sustainability Orientation

A triple bottom line approach, integrating economic, social, and environmental goals, is critical, with practices such as agroforestry and organic farming enhancing resilience (Hasan et al., 2025; Aliabadi et al., 2022). However, adoption is limited by knowledge and cost barriers, and policy fragmentation hinders sustainability integration (Purwantini & Sunarsih, 2019; Wube & Atwal, 2023). Climate change exacerbates productivity losses, with 50% of farmers reporting crop failures due to unpredictable weather (Rozci, 2021).

Role of Actors in Fostering Entrepreneurship

The interplay of actors is pivotal for agricultural MSMEs, with farmers leveraging training programs like PWMP to enhance innovation and risk-taking (Mukti et al., 2018). Government institutions provide critical policy support but are hindered by fragmentation, echoing findings from Ethiopia and Indonesia (Rivai & Anugrah, 2011; Abate & Sheferaw, 2023). Universities act as knowledge hubs, yet their urban focus leaves rural MSMEs underserved (Ningsih et al., 2021; Hu, 2025). Private industries facilitate market access but risk creating dependency due to unequal power dynamics (Purnaningsih & Sugihen, 2008). Community organizations and NGOs foster collective action and sustainable practices, but weak institutional frameworks and funding constraints limit their impact (Sulistyowati et al., 2023). Network theory highlights strong community-market ties but weak government linkages, suggesting a need for structured platforms like regional innovation hubs to enhance coordination (Burt, 1992; Fkun et al., 2023).

Impact of Financial and Technological Barriers

Financial and technological barriers significantly constrain MSMEs. Limited credit access (32%) and mismanaged subsidies reflect systemic financial inclusion issues, consistent with findings in South Africa (Ogujiuba et al., 2023). The low adoption of smart farming technologies (10%) due to high costs and low digital literacy aligns with the challenges in Pakistan (Rachmawati, 2020; Jan et al., 2025). Integrating microfinance with technology training could address these gaps, as seen in North Sulawesi's digital EE (Munaiseche et al., 2022). Strengthening cyber extension and rural infrastructure is critical to enhance productivity and ecosystem vitality (Fadilla et al., 2023).

Market Access and Socio-Cultural Influences

Market access challenges, with 65% of farmers facing income instability, highlight the need for models like CSA, which face scalability issues due to logistical constraints and low consumer awareness (Saragih, 2018; Sulistyowati et al., 2023). Digital platforms could bridge market linkages, but the digital divide limits adoption. Socio-cultural factors, including the low-status perception of

agriculture (resulting in 70% millennial disengagement) and gender biases, deter participation, aligning with findings in India (Prastiyanto et al., 2022; Rathore et al., 2023). Cultural campaigns and inclusive policies could reposition agriculture as entrepreneurial and empower women (Dimick & Richard, 2025).

Policy and Sustainability Challenges

Fragmented government policies and high-cost smart farming initiatives limit ecosystem impact, particularly with an ageing farmer demographic (Rivai & Anugrah, 2011; Rachmawati, 2020). Climate change, causing 50% of farmers to report crop failures, underscores the need for climate-smart agriculture (Rozci, 2021). Sustainable practices, such as organic farming, face barriers in terms of cost and market demand, requiring robust policy support (Purwantini & Sunarsih, 2019). Comparative insights from Iran and India suggest integrating sustainability into policy frameworks to enhance ecosystem resilience (Aliabadi et al., 2022; Rathore et al., 2023).

Implications for Ecosystem Development

The findings advocate a holistic approach to strengthen the ecosystem. Enhancing quadruple helix collaboration can address coordination gaps, while scaling agribusiness incubators and digitalization initiatives can bridge financial and technological barriers (Mukti et al., 2025). Rural-focused infrastructure investments and digital training, as seen in China and Malawi, could enhance competitiveness (Hu, 2025; Chilita, 2024). Cultural campaigns to reposition agriculture and inclusive policies for youth and women are essential (Prastiyanto et al., 2022; Dimick & Richard, 2025). Integrating climate resilience and sustainability into policies will ensure long-term viability (Rozci, 2021; Benussi & Samoggia, 2025). Theoretically, this study advances EE models by contextualizing them to Indonesian agriculture, integrating triple bottom line perspectives (Stam, 2015; Benussi & Samoggia, 2025). Practically, it suggests enhancing government coordination, expanding fintech access, and prioritizing rural infrastructure (Fkun et al., 2023).

CONCLUSIONS

This study concludes that Indonesia's agricultural MSME ecosystem is shaped by diverse actors—entrepreneurs, cooperatives, financial institutions, government bodies, NGOs, and communities—and key factors such as policy, finance, human capital, infrastructure, markets, and sustainability. However, ecosystem development remains constrained by fragmentation, limited financial access, weak knowledge flows, and infrastructure gaps. The study enhances entrepreneurial ecosystem and network theory in agriculture while offering practical insights for improving policy coherence, digital transformation, and inclusive entrepreneurship. One immediate implication for local stakeholders is the establishment of rural innovation hubs and the revitalization of farmer cooperatives to strengthen grassroots support systems. Strengthening coordination and inclusion is essential for fostering a more resilient and innovation-driven ecosystem.

LIMITATIONS & FURTHER RESEARCH

This research is limited by its reliance on secondary data, which may result in a reduced contextual depth and overlook local nuances. The literature reviewed was mainly in English and Indonesian, possibly excluding region-specific insights, especially from underserved areas such as Eastern Indonesia. Limited access to disaggregated data also affects the representativeness of findings. Additionally, secondary sources may reflect publication biases, often emphasizing formal narratives while underrepresenting the challenges faced at the ground level. These constraints underscore the need for future studies to employ primary data collection and longitudinal

approaches, thereby enhancing the ability to capture digital adoption, climate risks, regional diversity, and gender inclusion in ecosystem development.

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