



Vermiculture-Based Organic Farming as a Sustainable Agribusiness Model: A Thematic Framework for Local Enterprise Development

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Abstract

Small agricultural enterprises in developing and emerging economies face persistent structural challenges: high input costs, thin margins, limited market access, and dependence on commodity pricing logic that systematically disadvantages small producers. This paper argues that vermiculture-based organic farming constitutes a conceptually coherent and strategically defensible agribusiness model for addressing these challenges within local enterprise development contexts, particularly in Southeast Asia. Drawing on a conceptual thematic synthesis of peer-reviewed literature across five domains — organic farming as entrepreneurial opportunity, vermiculture and vermicomposting as production logic, organic produce differentiation and consumer value, local market access strategy, and sustainable entrepreneurship and circular economy theory — the paper proposes an integrated agribusiness framework organized around three functional layers: a circular production layer in which organic waste is converted through vermiculture into vermicompost and subsequently into organically differentiated crops; a local market layer in which differentiated produce is positioned and distributed through short food supply chains and direct selling channels; and a value capture layer generating both enterprise value through cost control and premium pricing, and community value through employment, income generation, organic waste diversion, and ecological stewardship. The analysis establishes that the model's strategic coherence derives from the reinforcing relationships among its components — waste valorization reduces input costs, reduced input costs support organic differentiation, differentiation enables premium local market positioning, and local market embeddedness reinforces community value creation. The paper concludes that the model is conceptually robust and practically relevant, while explicitly acknowledging that site-specific market validation, financial modeling, and production planning are necessary prerequisites for any specific implementation. Recommendations are provided for small agricultural entrepreneurs, local government and development agencies, training institutions, and future researchers.

Keywords: *vermiculture-based agribusiness; organic farming entrepreneurship; sustainable agribusiness model; local enterprise development; short food supply chains; circular economy in agriculture; sustainable entrepreneurship*

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1. Introduction

The global food system is undergoing a period of structural reassessment. Rising consumer awareness of food safety, growing concern over the environmental consequences of chemically intensive agriculture, and the increasing fragility of conventional agricultural supply chains have collectively intensified interest in organic farming as both an environmental practice and an entrepreneurial opportunity. In developing and emerging economies, this transition carries particular strategic weight. Small agricultural enterprises — which constitute the dominant organizational form in rural and peri-urban food production across Southeast Asia — are simultaneously positioned at the intersection of

growing organic demand and deepening structural vulnerability: input cost inflation, margin compression, limited market access, and dependence on commodity pricing logic that systematically disadvantages small producers.

In the Philippine context, as in comparable economies across the region, small-scale farming households and community-based agricultural enterprises face a persistent structural tension. On one hand, they operate in environments where consumer demand for locally sourced, chemically safe, and organically produced food is expanding, driven by urbanization, health consciousness, and post-pandemic shifts in food purchasing behavior. On the other hand, the costs of participating in organic markets — certification overhead, soil transition periods, premium input requirements, and supply chain access — have historically limited the practical reachability of organic production for smallholder and micro-enterprise operators. The result is a strategic gap: an identifiable market opportunity that existing enterprise models are poorly equipped to exploit at local scale.

Vermiculture-based organic farming presents a conceptually distinctive response to this gap. Vermiculture — the systematic cultivation of earthworms, typically *Eisenia fetida* or related species, for the purpose of converting organic waste into vermicompost — functions simultaneously as a waste management technology, an organic input production system, and a soil enhancement mechanism. When integrated with organic crop production, vermiculture enables a farm enterprise to internalize a significant portion of its soil fertility inputs, reducing dependence on commercially purchased fertilizers and synthetic soil amendments. This input substitution logic is not merely an agronomic convenience; it constitutes a structural cost-control mechanism that alters the financial architecture of small farm operations in strategically meaningful ways.

Beyond its production logic, vermiculture-based organic farming carries a value proposition that extends into product positioning and market strategy. Organically produced fruits and vegetables grown through vermicompost-enriched soil can credibly claim attributes — chemical residue absence, soil health integrity, ecological cultivation practice, and freshness traceability — that are increasingly valued by health-conscious consumers, institutional food buyers, and local food system advocates. These attributes support product differentiation strategies that allow small organic producers to move away from commodity pricing toward value-based market positioning, even within local and informal retail environments. The strategic implication is significant: a small enterprise that controls its input production through vermiculture and positions its output through organic differentiation occupies a structurally more defensible competitive position than a conventional smallholder operating under price-taker conditions.

Equally important is the community dimension of this model. In local enterprise contexts, particularly in rural and peri-urban areas of developing economies, the value of a business model extends beyond the boundaries of the individual enterprise. Vermiculture-based organic farming models that create employment, generate local income, divert organic waste from landfills and informal dumping, and demonstrate ecologically responsible land use contribute forms of community value that are increasingly recognized in sustainable entrepreneurship literature as legitimate components of enterprise performance and social legitimacy. This multi-value logic — economic, environmental, and social — aligns the vermiculture-based organic farm with the strategic architecture of circular economy enterprise design, where waste streams become productive inputs and sustainability credentials reinforce rather than contradict commercial viability.

Despite the conceptual promise of this integration, the academic and strategic management literature has not yet produced a consolidated framework that brings together vermiculture-based production, organic product differentiation, local market strategy, cost and operational logic, and community value creation within a single analytically coherent agribusiness model. Studies of vermicomposting and its agronomic applications are abundant in soil science and agricultural research. Literature on organic food consumer behavior, willingness-to-pay dynamics, and organic certification systems is well developed in agricultural economics and food marketing. Sustainable entrepreneurship scholarship has advanced considerably in framing the logic of enterprises that simultaneously pursue economic and social-environmental objectives. Yet the integration of these bodies of knowledge into a strategic framework specifically designed to guide entrepreneurial decision-making in local vermiculture-based organic agribusiness remains underdeveloped.

This paper addresses that gap. It is written as a conceptual thematic synthesis — a paper that does not present primary empirical data but derives its contribution from the systematic integration of existing literature across multiple thematic domains, organized around a core strategic and entrepreneurial question: how can vermiculture-based organic farming be understood, designed, and managed as a sustainable agribusiness model for local enterprise development?

The paper pursues four specific objectives. First, it synthesizes existing literature on organic farming, vermiculture, sustainable entrepreneurship, and local agribusiness development in order to establish the conceptual foundations of the model. Second, it identifies the major strategic components of a vermiculture-based organic agribusiness enterprise, clarifying the functional relationships among production, differentiation, market access, cost management, and community contribution. Third, it explains how vermiculture specifically supports each of these strategic dimensions — not merely as an environmental add-on but as an operationally integrated mechanism that reinforces the model's commercial and social coherence. Fourth, it proposes a conceptual framework that links vermiculture-based production with enterprise and community value creation in a form that is analytically clear and practically applicable by entrepreneurs, agricultural development practitioners, local government units, and future researchers.

It is important to establish at the outset what this paper does not claim. It does not assert the financial feasibility of any specific vermiculture-based organic farming venture. Feasibility is site-specific, market-specific, and scale-specific; it depends on local input prices, consumer demand conditions, land availability, labor cost structures, and management capacity in ways that cannot be resolved by conceptual analysis alone. This paper's contribution is conceptual and strategic: it argues that the model is coherent, that its logic is defensible, and that it provides a useful organizing framework for entrepreneurial decision-making and institutional support — not that any particular business will succeed simply by adopting the model. That distinction between conceptual robustness and operational feasibility is maintained throughout the paper and is considered an essential condition of its intellectual integrity.

2. Review of Related Literature

2.1 Organic Agriculture and Local Agribusiness as an Entrepreneurial Opportunity

The body of literature examining organic agriculture as an entrepreneurial strategy for small-scale producers in developing economies has grown substantially over the past decade, and a broad consensus has emerged around the proposition that organic farming offers viable, if contextually conditioned, commercial and livelihood opportunities for smallholder operators. Jouzi et al. (2017), in a widely cited review focused on small-scale farmers in developing countries, identified several strategic advantages that organic farming offers relative to conventional agriculture: income improvement through premium pricing, reduced dependence on externally purchased synthetic inputs, enhanced environmental resilience, and expanded employment and social capacity within farming communities. These findings, replicated in varying forms across a range of country contexts, suggest that the entrepreneurial case for organic small-farm enterprise is not merely aspirational but grounded in recoverable patterns of commercial and social performance.

Evidence from Asia provides particularly relevant context for the Southeast Asian framing of this paper. Qiao et al. (2018), drawing on household survey data from Wanzai County in Jiangxi Province, China, found that certified organic farming contributed to significantly higher farm incomes for small-scale operators, with cooperative membership further amplifying economic returns. An earlier study by Qiao et al. (2015), comparing organic and fair-trade tea production in China and Sri Lanka, found that the price premium received by organic producers compensated for the labor intensity and yield differentials of organic production, and that certification generated social benefits including expanded local employment, particularly for women. These findings from Asian contexts carry direct analytical relevance for this paper's concern with local enterprise development in comparable emerging-economy settings.

Mariappan et al. (2019), examining organic farming in the Tamil Nadu region of India, found statistically significant differences in profitability between organic and conventional farming systems, attributing this to the dual effect of reduced input costs and higher market returns from organically produced rice. Hernandez et al. (2019), examining small organic farmers in rural Mexico, reinforced this argument by showing that reduced dependence on external chemical inputs is a structural financial advantage of organic production systems, not merely an ecological preference. Deka et al. (2020), in a multi-site case study of small organic tea growers in Assam, India, introduced the entrepreneurial behavior dimension explicitly, arguing that the successful organic small farmers in their study exhibited innovation, risk tolerance, and opportunity orientation — characteristics that distinguish sustainable farm enterprise from subsistence adaptation.

A significant strand of the literature, however, qualifies the entrepreneurial case for organic farming with evidence on structural barriers. Hattam (2019), using Theory of Planned Behavior to study avocado producers in

Mexico, found that even farmers with positive attitudes toward organic production held negative conversion intentions, largely due to concerns about certification access, technical capacity, and credit constraints. Chen (2015), in an extensive study of China's organic agriculture sector, found that small-scale farmer inclusion in organic value chains was highly conditioned by ownership structure and market channel access, with cooperative models outperforming contract-farming models in terms of farmer autonomy and income equity. The implication of this strand of evidence is clear: organic agriculture is an entrepreneurially viable path, but its commercial realization depends on the resolution of specific access, capacity, and market integration challenges — challenges that the vermiculture-based model addresses, at least in part, through its internal input production logic.

At the broader regional level, the commercial realization of local agribusiness opportunities must also be read against the structural conditions that shape entrepreneurship in ASEAN economies. Atento (2026) found that formal business entry in ASEAN is associated with factors such as population density, domestic credit to the private sector, GDP per capita, and persistent country-level heterogeneity, suggesting that small agribusiness models require not only production-level innovation but also supportive financial, institutional, and market environments.

Methodologically, this theme is dominated by case study and household survey designs, with most studies drawing from single countries or regions and relying on cross-sectional data. Few studies model the strategic design of organic small-farm enterprise as a whole system; most focus on income, certification, or market access as isolated variables. This methodological tendency toward component-level analysis — rather than integrated enterprise-level analysis — is itself a gap that the integrated framework proposed in this paper is designed to address.

2.2 Vermiculture and Vermicomposting: Production Logic and Agricultural Application

The scientific and agricultural management literature on vermiculture and vermicomposting is extensive, and its main findings are consistent across a wide range of experimental and review studies: vermicompost substantially improves soil fertility across physical, chemical, and biological dimensions, and vermicomposting represents a technically feasible, economically accessible, and operationally scalable method of converting organic waste into productive agricultural inputs. The strategic significance of these findings for small agribusiness enterprise design is considerable and underlies the production logic of the model proposed in this paper.

Lim et al. (2015), in a foundational review that has accumulated more than 400 citations, established that vermicompost improves soil aeration, porosity, bulk density, and water retention at the physical level, and enhances pH management, electrical conductivity, and organic matter content at the chemical level. Beyond nutrient provision, Lim et al. noted the presence of biologically active growth-promoting substances in vermicompost — including plant growth hormones — that contribute to crop performance in ways not fully explained by nutrient content alone. Rehman et al. (2023), in a comprehensive review, confirmed that vermicompost can serve as a sustainable substitute for chemical fertilizers and pesticides, supporting contaminant-free food production while improving soil health and reducing environmental stress on agricultural systems. Oyege et al. (2023), examining vermicompost application in grain crops including maize, wheat, barley, and rice, found that vermicompost improved soil quality, increased nutrient availability, and boosted crop productivity while also demonstrating pest and disease tolerance benefits — a finding of direct relevance to organic vegetable and fruit production systems.

Manzoor et al. (2024), focusing specifically on vegetable production, found that vermicompost application reduced soil pH where needed, improved porosity and water retention, enhanced microbial activity, and led to better germination, growth, and yield outcomes for vegetable crops under varying climatic stresses. This finding is particularly relevant for local organic farm enterprises oriented toward fresh vegetable and fruit production, which is the productive focus of the agribusiness model under analysis. Toor et al. (2024), in a controlled study of lettuce production in Turkey, found that a two percent vermicompost application rate produced the highest yield increase — 56 percent over the control — underscoring the dose-sensitivity of vermicompost application and the importance of management knowledge in realizing its benefits.

The waste conversion dimension of vermiculture carries equally important strategic implications. Kaur (2020) described vermicomposting as a low-cost, eco-biotechnological process in which earthworms and microorganisms jointly convert biodegradable wastes into a nutritive, pathogen-reduced organic fertilizer rich in humus, macronutrients, micronutrients, nitrogen-fixing bacteria, and plant growth hormones. Sharma et al. (2019), reviewing organic waste recycling in agriculture, identified vermicomposting as one of the most promising agricultural waste valorization technologies because it simultaneously reduces landfill pressure, replaces chemical fertilizer imports, and opens rural employment avenues — a combination of environmental and economic effects that aligns closely with the

community value logic developed in this paper. Dada (2024), in a review specifically oriented toward smallholder farmers in developing countries, argued that vermiculture and vermicomposting represent practically accessible technologies for small farms, noting that vermicomposting units can be constructed from locally available materials and managed without specialized scientific infrastructure.

The literature also records the adoption barriers that practitioners face. Rastegari et al. (2023), in a mixed-methods study of Iranian farmers, found that the primary barriers to on-farm vermicomposting adoption included initial investment costs, short-term thinking among farmers, lack of necessary infrastructure, and insufficient subsidies. Lalander et al. (2015), in a Kampala, Uganda case study, demonstrated a 280 percent return on investment for a vermicomposting system treating cow manure at small-scale urban farm settings, while also acknowledging that hygiene quality management requires deliberate post-stabilization protocols. These findings collectively suggest that vermiculture is productively validated but adoption-constrained — a distinction that has implications for how the agribusiness model proposed in this paper should be framed for entrepreneurial and institutional audiences.

2.3 Value Proposition Design and Organic Produce Differentiation

The market for organic food is not homogeneous, and the literature on consumer preferences and willingness to pay for organic produce reveals a complex landscape of motivations, attribute priorities, and segmentation patterns that have significant implications for how small organic farm enterprises position their products. The dominant finding across this literature is that consumers do assign premium value to organic produce, but the magnitude and stability of that premium are conditioned by the credibility of organic claims, the visibility of health and environmental attributes, income levels, and the local or relational identity of the product.

Li et al. (2021), in a meta-analysis of 80 worldwide studies, estimated an overall willingness-to-pay premium for sustainable food products of approximately 29.5 percent on average, with the organic attribute generating higher willingness-to-pay estimates than other sustainability attributes. Crucially for the Southeast Asian context, Li et al. found that Asian willingness-to-pay estimates in percentage terms were comparable to European estimates and higher than North American ones — a finding that supports the commercial viability of premium organic positioning in emerging Asian markets. Nandi et al. (2017), studying consumers in Bangalore, India, found that approximately 90 percent of surveyed consumers expressed willingness to pay a premium for organic fruits and vegetables, with chemical residue concerns, trust in retailers, and family income among the significant predictors of that willingness.

Hu et al. (2024), in a study of young Chinese consumers, found that environmental concern, health consciousness, and green psychological benefits jointly shaped both organic food consumption attitudes and willingness to pay price premiums, confirming that the convergence of health and environmental motivation is strategically important for organic product communication. Cagalj et al. (2016), using experimental auctions in Croatia, found that organic tomatoes commanded a 59 percent premium and organic apples a 42 percent premium, with environmental and health claims adding further incremental premium on top of the base organic label. Mustapa et al. (2025), in a meta-analysis of consumer willingness to pay for short food supply chain products, found an average premium of 34.5 percent, with organic products within short supply chains receiving the highest willingness-to-pay estimates — a convergence finding of direct relevance to vermiculture-based local organic farm enterprises that combine both organic identity and short-chain proximity.

The relationship between local identity and organic value is consistently positive in the literature but is also more nuanced than simple complementarity. Jensen et al. (2019), studying Danish consumers, identified distinct consumer segments oriented respectively toward locally produced food and organically produced food, finding that some consumers view local and organic as complementary while others prioritize one over the other. Hempel et al. (2015), in a study combining consumer surveys and in-store choice experiments in Germany, found that organic-minded consumers placed higher value on local food production relative to non-organic-minded consumers, suggesting that the overlap between organic and local identity is most commercially significant among the consumer segment already predisposed to organic purchasing. Aleksejeva et al. (2021) found that consumers prefer short food supply chains for organic food purchases and that locally sourced organic produce is associated with food safety and quality perceptions that reinforce purchasing behavior.

Basha et al. (2019), in a large-scale study of Indian consumers, found that environmental concerns, health and lifestyle considerations, product quality, and support for local farmers were among the factors that significantly influenced purchasing intentions for organically produced food — a finding that suggests organic value propositions in developing Asian markets can successfully integrate multiple differentiation dimensions simultaneously. The

practical implication for the vermiculture-based organic agribusiness model is that product differentiation need not rely on formal certification alone. Freshness, local origin, visible ecological practice, and relationship-based trust — all characteristics naturally associated with small-scale vermiculture-based organic farm enterprises — constitute a commercially viable value proposition that can support premium positioning through market channels where formal certification overhead is prohibitive.

This trust-based differentiation logic is consistent with adjacent consumer-centered marketing research, which shows that community value signals can be translated into decision triggers such as trust, credibility, identity affirmation, and perceived relevance (Atento & Espelita, 2025). For small organic producers, this suggests that the credibility of organic claims may depend not only on formal labels but also on the producer's ability to communicate locally meaningful values in ways that consumers recognize and trust.

2.4 Market Access and Distribution Strategies for Small-Scale Organic Farms

Market access is the commercial pivot on which organic farm enterprise viability turns. The literature on distribution channels available to small organic producers reveals a broad set of mechanisms — direct selling, farmers' markets, community-supported agriculture, short food supply chains, institutional buyers, and local retail — each with distinct cost structures, revenue profiles, relationship requirements, and scalability constraints. Understanding the conditions under which these channels support sustainable small enterprise performance is central to the market strategy dimension of the vermiculture-based agribusiness model.

Kneafsey et al. (2013), in a comprehensive study of short food supply chains in the European Union, established that such chains are characterized by minimal intermediary involvement, direct traceability to the producer, and dominance by small-scale operators frequently engaged in organic farming. Their analysis identified community-supported agriculture, on-farm sales, farmers' markets, and collective sales to institutional buyers as the principal short-chain formats, and documented social, economic, and environmental benefits including producer income improvement, consumer food quality satisfaction, and reduced environmental logistics costs. Bui et al. (2021), examining short food supply chains in Vietnam — a directly relevant Southeast Asian comparator — found that small farmers participating in short chains reported stabilized input and output prices, more sustainable incomes, reduced gender discrimination in rural areas, and improved environmental practices, including adoption of organic and clean production methods.

Hardesty and Leff (2009), in a detailed case study analysis of three organic farming operations in the United States, found that marketing costs per dollar of revenue were lowest in the wholesale channel and highest in the farmers' market channel, due to the labor intensity of direct selling and transportation costs. However, they also found that direct marketing channels enabled smaller farmers to build financially viable operations by gaining market access and reducing marketing risk — a finding that qualifies simple revenue comparisons and emphasizes the total enterprise viability logic rather than channel-specific margin analysis. Park et al. (2014), using national farm-level data, found that marketing skills significantly affect the financial performance of direct-to-consumer sales, indicating that market channel selection alone does not determine enterprise performance; the capacity to manage relationships, price strategically, and control logistics within chosen channels matters as much as channel type.

Gonzalez-Azcarate et al. (2021), studying Spanish consumers, found that food quality, health information, and rural development support were primary drivers of short food supply chain participation, while lack of convenience and difficulty in finding reliable producers were principal barriers. These consumer-side findings have practical implications for how small organic farm enterprises should position themselves in local markets: clear product communication, reliability of supply, and ease of access are market competence requirements that are as strategically important as production quality. Mosadegh Sedghy et al. (2024), in an analysis of organic fruit supply chains in retail versus short channels, found that consumers are willing to pay a higher premium for organic products in short channels, and that short channels confer greater market power to producers relative to the retail channel.

Digital visibility may also become a complementary market-access mechanism for small organic producers, although it should be treated as a trust-building tool rather than a substitute for product quality or supply reliability. In an adjacent Philippine consumer-intention study, Espelita et al. (2026) found that brand trust was the strongest predictor of enrollment intention, while social media usage had a smaller but still positive contribution, indicating that digital exposure is most useful when it reinforces credibility rather than merely increasing promotional volume.

Yacaman Ochoa et al. (2020), examining peri-urban organic agriculture and short food supply chains in Spain, found that proximity to urban markets constitutes a comparative advantage for small organic producers, enabling fresher supply, faster rotation of perishable produce, and stronger consumer relationships. For the Southeast Asian context, where small agricultural enterprises frequently operate in peri-urban or community-proximate settings with relatively direct access to household and institutional buyers, this proximity advantage is structurally available and strategically exploitable. Hansika et al. (2021), in a climate-focused evaluation of an organic direct farmers' market in Kurunegala, Sri Lanka — one of the closest geographic and institutional comparators to the Philippine context in the entire literature — found that farmer incomes increased and stabilized after joining the organic direct market, and that the market achieved economic, social, and environmental sustainability simultaneously.

2.5 Sustainable Entrepreneurship, Circular Economy Logic, and Community Value Creation

The theoretical architecture of the vermiculture-based organic agribusiness model finds its most direct conceptual home in the intersecting literatures of sustainable entrepreneurship and circular economy. These two bodies of knowledge converge around a shared proposition: that enterprise design can simultaneously pursue economic viability, environmental stewardship, and social value creation — and that the integration of these three dimensions is not a constraint on commercial performance but a structural reinforcement of it.

Rosario et al. (2022), in a scoping review of sustainable entrepreneurship literature, defined the field as the alignment of social, economic, and ecological objectives within entrepreneurial activity, noting that service-oriented and resource-efficient business models have contributed significantly to the growth of sustainable entrepreneurship as both a practice and a scholarly domain. Ebabu et al. (2025), in a systematic review and bibliometric analysis synthesizing 476 peer-reviewed studies on sustainable entrepreneurship from 2000 to 2024, confirmed that sustainable entrepreneurship plays a pivotal role in driving economic growth, job creation, and innovation, particularly in green sectors such as renewable energy and waste management — and identified agricultural waste management as one of the sectors where this evidence base is most actionable. Al-Qudah et al. (2021), examining data from fifteen RCEP countries including multiple Southeast Asian economies, found a positive relationship between social entrepreneurship and sustainable development, reinforcing the case for enterprise models that integrate economic and social value creation rather than treating them as trade-offs.

The circular economy dimension is equally important to the paper's analytical architecture. Velasco-Munoz et al. (2021), in a systematic review of circular economy frameworks applied to agriculture, identified waste-to-resource conversion, nutrient cycling, and closed-loop production as the core circular strategies available to agricultural enterprises, and confirmed that these strategies reduce dependence on external input markets while improving soil health and long-term productive capacity. Donner et al. (2021), analyzing 39 cases of eco-innovative business models valorizing agricultural waste and by-products, identified technical and logistical feasibility, price competitiveness of bio-based products, local stakeholder involvement, and space availability as critical success factors for circular agribusiness models — each of which is present in the vermiculture-based organic farm enterprise design analyzed in this paper. Peng et al. (2025), in a systematic review of circular economy applications in agriculture, confirmed that vermicomposting and composting are among the most widely documented technical innovations within agricultural circular economy practice.

The institutional support dimension of this model also connects with education for sustainable development. Atento (2025) found that Philippine higher education institutions often integrate SDG themes unevenly in management education, with stronger emphasis on SDG 4 and SDG 8 but weaker attention to SDG 2 and SDG 13, despite the relevance of food security and climate resilience to Philippine development conditions. This suggests that training institutions supporting vermiculture-based agribusiness can contribute not only technical skills but also sustainability literacy aligned with locally urgent development priorities.

The community value dimension of sustainable agribusiness enterprise has received growing attention in the literature, though it remains underdeveloped relative to the economic and environmental strands. Jouzi et al. (2017) documented that organic farming enhances employment opportunities, social capacity, and food purchasing power within farming communities — outcomes that are amplified rather than diminished when the enterprise operates at local scale with direct community supply chains. Qiao et al. (2015) found that certified organic production projects in China and Sri Lanka created paid local employment, community organizing, and training opportunities, particularly benefiting women of reproductive age. These social value effects are not incidental to the enterprise model but are structurally embedded in its logic: a farm enterprise that converts local organic waste into productive inputs, employs

community labor in cultivation and processing, and sells differentiated produce through local channels is, by design, a community value creator — not merely a private economic actor.

2.6 Synthesis of Literature

Taken together, the five thematic strands reviewed in this section converge on a set of analytically consistent findings that collectively support the conceptual architecture of the vermiculture-based organic agribusiness model. The literature on organic farming as an entrepreneurial opportunity establishes that small-scale organic producers in developing and emerging economies can achieve income improvement, input cost reduction, and social capacity gains relative to conventional agricultural practice — but that these outcomes are conditioned on market access, technical capacity, and some form of institutional or cooperative support. The literature on vermiculture and vermicomposting confirms that earthworm-based organic waste conversion is a technically robust, cost-accessible, and agronomically validated method of producing high-quality soil amendments that support crop yield, soil health, and environmental sustainability across a range of crop types and production scales relevant to small farm enterprises.

The consumer behavior and organic differentiation literature establishes that demand for organic produce carrying health, safety, environmental, and local-origin attributes is substantial and demonstrably price-inelastic among key consumer segments — including in Asian emerging-market contexts where willingness-to-pay estimates are comparable to European markets. This finding provides a market-side foundation for the differentiation logic embedded in the proposed model. The short food supply chain and direct marketing literature reinforces this by showing that proximity-based, relationship-anchored market channels can improve producer income, market power, and supply chain resilience for small organic producers — though the literature also establishes that channel selection alone does not determine enterprise performance; marketing skill, supply reliability, and consumer communication capacity matter as much as channel type.

Finally, the sustainable entrepreneurship and circular economy literature provides the overarching theoretical legitimacy for the integration of these dimensions within a single enterprise design. Circular economy practice in agriculture, anchored in waste-to-resource conversion and closed-loop nutrient cycling, has been shown to improve resource efficiency, reduce input costs, and generate social and environmental value simultaneously. The five themes are not merely additive — they are mutually reinforcing. Vermiculture supports organic production; organic production supports differentiation; differentiation supports premium pricing in local channels; local channels support community value; and community value reinforces the enterprise's social legitimacy and resilience.

From a strategy perspective, this movement away from commodity-price competition also parallels adjacent SME research on value innovation. Teodosio et al. (2025) show that Philippine micro and small enterprises can pursue more defensible market positions by combining differentiated service design, digital touchpoints, customer-centered utility, and sustainability features, a logic that resonates with the vermiculture-based model's emphasis on cost control, organic differentiation, and locally embedded value creation.

2.7 Gaps in the Literature

Despite the depth of the individual thematic literatures reviewed, several significant gaps limit the practical utility of existing scholarship for entrepreneurs and development practitioners seeking to design, evaluate, or support vermiculture-based organic agribusiness enterprises. The most consequential gap is the absence of integrated frameworks. The existing literature addresses organic farming, vermicomposting, consumer behavior, short food supply chains, and sustainable entrepreneurship as largely separate domains. This fragmentation means that entrepreneurs and institutional supporters lack a consolidated analytical tool for understanding how the components of a vermiculture-based organic farm enterprise interact as a strategic system.

A second gap concerns geographic and institutional specificity. The majority of literature on organic farming entrepreneurship, consumer willingness to pay, and short food supply chains originates from European, North American, Chinese, and Indian contexts. Southeast Asian evidence is sparse, and the institutional conditions, consumer market structures, land tenure arrangements, and local government support environments in Southeast Asian economies differ materially from European or Chinese conditions.

A third gap concerns the community value dimension of agribusiness enterprise design. While sustainable entrepreneurship literature acknowledges the importance of social value creation, few studies operationalize community value creation — employment generation, waste reduction, income circulation, ecological stewardship —

as an integral component of agribusiness enterprise performance. A fourth gap is methodological: most empirical studies in this domain are cross-sectional, component-specific, and context-bound, reflecting a scholarly tendency to study parts of the problem rather than the system as a whole.

2.8 Contribution of the Present Paper

This paper addresses the gaps identified above by proposing an integrated thematic framework that brings together the production, differentiation, market access, cost management, and community value dimensions of vermiculture-based organic farming within a single analytically coherent agribusiness model. Rather than treating these dimensions as separate research objects, the paper examines their structural interconnections and argues that the viability of the model derives from the reinforcing relationships among its components — not from the independent performance of any single element.

The paper contributes to the sustainable entrepreneurship literature by grounding circular economy logic in the operational and strategic realities of small-scale agricultural enterprise, particularly in Southeast Asian and comparable emerging-economy contexts. It contributes to the organic agribusiness literature by providing a strategic framework that goes beyond production and certification to address market positioning, channel strategy, and community value creation as integrated enterprise design problems. And it contributes to the circular economy in agriculture literature by showing how vermicomposting functions not merely as a waste management technology but as the productive core of a strategically coherent agribusiness system. The proposed framework is intended to be useful not only as a scholarly contribution but as a practical organizing tool for small agricultural entrepreneurs, local government agricultural development units, farming cooperatives, and training institutions.

3. Methodology

3.1 Research Design

This paper adopts a conceptual thematic synthesis design. Conceptual thematic synthesis is a form of qualitative, non-empirical scholarly inquiry in which existing bodies of literature across multiple thematic domains are systematically gathered, analytically organized, and interpretively integrated to generate new conceptual understanding — in this case, a strategic framework for understanding vermiculture-based organic farming as a sustainable agribusiness model for local enterprise development. This design is appropriate for research questions that are integrative rather than empirical in character: questions that ask not what a specific population reports or what a dataset reveals, but how existing knowledge across distinct scholarly domains can be organized into a coherent explanatory and prescriptive framework.

The choice of a non-empirical design reflects both the nature of the research problem and the state of the existing literature. As established in Section 2.7, no integrated framework currently exists that connects vermiculture-based production logic, organic product differentiation, local market access strategy, circular economy cost logic, and community value creation within a single agribusiness model architecture. This paper does not generate, collect, or analyze primary data. It does not conduct surveys, interviews, experiments, or statistical analyses. All analytical findings derive from the integration and interpretation of existing peer-reviewed literature.

3.2 Literature Search and Selection

Literature for this paper was gathered through systematic searches of the Consensus database, a peer-reviewed academic literature search platform providing access to more than 200 million scholarly papers indexed across Semantic Scholar, PubMed, Scopus, and related repositories. Searches were conducted using ten targeted queries corresponding to the five thematic areas of the review — two queries per theme — with peer-reviewed publications filtered to exclude preprints. Search queries were constructed using academic terminology appropriate to each thematic domain and were designed to capture studies most directly relevant to the paper's core strategic and entrepreneurial problem framing.

Papers were selected for inclusion based on thematic relevance to the paper's research objectives, methodological credibility as indicated by peer-review status and citation record, geographic diversity with particular attention to developing-economy and Southeast Asian contexts, and recency, with preference given to studies published within the past decade while also retaining foundational works of enduring analytical importance.

3.3 Thematic Synthesis Procedure

Retrieved literature was organized into five thematic clusters corresponding to the strategic architecture of the vermiculture-based organic agribusiness model: the entrepreneurial opportunity structure of organic farming; the production and input logic of vermiculture and vermicomposting; the value proposition and differentiation logic of organic produce; the market access and distribution strategy available to small organic producers; and the sustainable entrepreneurship and circular economy logic that provides the integrative theoretical frame for the model. These themes were sequenced deliberately from foundational agronomic and market context through to strategic and social synthesis, ensuring that each thematic section builds analytically on the preceding one.

Within each theme, papers were read for their principal findings, methodological characteristics, geographic scope, and points of agreement, disagreement, or qualification with other studies in the same domain. Findings were organized analytically rather than catalogued sequentially. Where studies converged on common conclusions, this convergence was treated as indicative of an established pattern. Where studies diverged, those divergences were noted and their implications for the paper's argument were addressed.

3.4 Framework Development

The integrated agribusiness framework proposed in Section 4.6 was developed through an iterative process of cross-thematic synthesis. After each thematic cluster was analyzed individually, the structural relationships among the five themes were examined for logical coherence, internal consistency, and practical applicability. The framework organizes the model's components — organic waste inputs, vermiculture and vermicomposting system, soil enhancement, organic crop production, differentiated produce, local market channels, enterprise value, and community value — into a connected system in which the output of each component serves as an input or enabler for the next. No element of the framework was introduced without a grounding in the reviewed literature.

3.5 Evaluative and Analytical Criteria

Throughout the synthesis, three evaluative criteria were applied consistently. The first is analytical grounding: every claim about the model's components or their relationships must be traceable to evidence or established reasoning in the reviewed literature. The second is strategic coherence: the framework must hold together as a logic system in which each component reinforces rather than contradicts the others. The third is practitioner relevance: the framework must be interpretable and useful by entrepreneurs, development practitioners, and institutional supporters operating in local agricultural enterprise contexts in Southeast Asia and comparable emerging-economy settings.

3.6 Limitations of the Approach

Several limitations of the conceptual thematic synthesis design merit explicit acknowledgment. First, this paper does not generate primary evidence. Its analytical findings are derived from existing literature and cannot substitute for the site-specific market research, financial modeling, production planning, and risk assessment that any specific vermiculture-based organic agribusiness venture would require before implementation. Second, the literature base reflects uneven geographic coverage, with studies from Europe, North America, China, and India substantially more numerous than studies from Southeast Asia. Third, the thematic synthesis approach produces integrative understanding at the cost of depth within any single domain — a design choice rather than an oversight, as the paper's purpose is strategic integration rather than disciplinary comprehensiveness.

4. Thematic Findings and Framework Development

4.1 Vermiculture as Input Innovation

The first and most foundational strategic insight to emerge from the literature synthesis is that vermiculture functions, within the context of small organic agribusiness, not merely as an environmental practice but as a form of input innovation — a deliberate reorganization of the enterprise's resource acquisition logic that replaces purchased synthetic inputs with internally produced organic ones. This reframing carries significant strategic implications that extend well beyond agronomy.

Conventional smallholder agriculture is structurally dependent on externally sourced inputs — synthetic fertilizers, pesticides, and soil conditioners — whose prices are subject to global commodity dynamics entirely beyond the control of local producers. This dependency creates a cost structure that is simultaneously inflexible and exposed: when input prices rise, margins compress; when input supply is disrupted, production falters. The vermiculture system disrupts this dependency by converting organic waste — a resource that is locally abundant, continuously generated, and effectively without acquisition cost — into vermicompost, a soil amendment whose agronomic performance the literature has established as comparable or superior to synthetic fertilizer in key dimensions of soil fertility, crop yield, and biological soil health.

The strategic innovation is not biological but organizational: it consists of recognizing organic waste as a productive asset rather than a disposal problem, and designing the enterprise to capture that asset systematically. Dada (2024) established that this organizational recognition is practically accessible to smallholder farmers in developing countries, noting that vermicomposting units can be established from locally available materials without specialized infrastructure. Lim et al. (2015) confirmed that the agronomic returns from this investment — improved soil aeration, water retention, nutrient availability, and biological activity — are substantial and durable. Rastegari et al. (2023) identified the principal barriers to adoption as initial investment cost, short-term orientation, and lack of training support — barriers that are organizational and institutional rather than technically fundamental, and therefore resolvable through enterprise design choices and institutional support.

What the literature collectively establishes is that vermiculture, when integrated into a small farm enterprise at the design level rather than adopted as an add-on, shifts the cost structure of organic production in a direction that improves both commercial sustainability and environmental performance simultaneously. This is the first structural link in the integrated agribusiness model: input innovation through waste valorization creates the agronomic and economic foundation on which the remaining strategic components are built.

4.2 Organic Farming as Product Differentiation

The second strategic finding concerns the relationship between organic production methods and market positioning. The literature synthesis reveals that organic produce carries a demonstrably differentiated value proposition in consumer markets — but that the realization of that differentiation into actual price premium depends critically on the credibility, visibility, and communication of the attributes that organic production generates.

The attributes that consumers associate with organically produced fruits and vegetables — absence of chemical residues, health and nutritional safety, ecological cultivation practice, freshness, and local origin — are precisely the attributes that vermiculture-based organic production is structurally positioned to deliver and credibly communicate. Rehman et al. (2023) established that vermicompost-grown produce can credibly claim contaminant-free production. Manzoor et al. (2024) demonstrated improved vegetable quality outcomes under vermicompost application. Li et al. (2021) confirmed that the organic attribute commands the highest willingness-to-pay premium among all sustainable food attributes, averaging nearly 30 percent above conventional alternatives globally, with Asian market premiums comparable to European ones. Nandi et al. (2017) found that chemical residue concerns and trust in producers were significant drivers of willingness to pay in Indian consumers — a proxy consumer profile with meaningful relevance to Southeast Asian urban and peri-urban markets.

The differentiation argument becomes strategically stronger when local identity is added to organic identity. Aleksejeva et al. (2021) found that consumers prefer short food supply chains for organic purchases, associating local organic produce with quality and safety above commercially distributed alternatives. Mustapa et al. (2025) found that organic products within short supply chains command the highest willingness-to-pay estimates among all short food supply chain product types. The important qualification that the literature introduces at this point is the distinction between potential differentiation and realized premium. Hattam (2019) demonstrated that positive consumer attitudes toward organic food do not automatically translate into purchasing behavior when access, price visibility, and trust are not managed. The strategic implication is that product differentiation in a vermiculture-based organic agribusiness requires active management: the enterprise must not only produce organically but must communicate the origin, method, and safety attributes of its produce through direct interaction, labeling, and relationship-building with buyers.

4.3 Local Market Access as Commercial Strategy

The third strategic finding addresses market channel selection and management for small organic farm enterprises. The literature establishes that small organic producers generally have access to a portfolio of local and

direct market channels — farmers' markets, direct household selling, community-supported agriculture, local retailers, and institutional buyers such as schools, hospitals, and government canteens — and that the strategic management of this channel portfolio, rather than exclusive reliance on any single channel, is associated with stronger financial performance and reduced market risk.

Kneafsey et al. (2013) established that short food supply chains are structurally compatible with small organic production systems and deliver a combination of producer income improvement, consumer quality satisfaction, and environmental logistics benefits. Bui et al. (2021) demonstrated these benefits under Vietnamese conditions — a Southeast Asian context that approximates the institutional and market environment relevant to this paper — finding that short food supply chain participation stabilized revenues and improved farmer confidence. Hansika et al. (2021), studying a direct organic farmers' market in Sri Lanka, found simultaneous economic, social, and environmental sustainability outcomes for participating small organic producers.

The financial architecture of direct and local market channels, however, is more complex than simple revenue comparison suggests. Hardesty and Leff (2009) found that farmers' market channels carry the highest marketing costs per dollar of revenue among all channel types, due to labor-intensive selling and transportation requirements. Park et al. (2014) found that direct-to-consumer channel performance is significantly moderated by marketing skill — producers with strong marketing and management competence outperform those without, even within the same channel type. Cortes et al. (2023), modeling channel allocation for small farms, found that an approximately even split between direct consumer channels and aggregator channels optimized seasonal revenue performance better than exclusive reliance on either. Jayalath et al. (2022), modeling organic perishable supply chains, found that minimizing unsold produce and post-harvest waste through coordinated volume-channel matching is a critical determinant of enterprise profitability. For small vermiculture-based organic farm enterprises, this means that production planning and market channel coordination must be treated as integrated management functions.

4.4 Circularity as Cost and Sustainability Logic

The fourth strategic finding concerns the role of circular economy logic in structuring both the cost efficiency and the environmental credibility of the vermiculture-based organic agribusiness model. The literature synthesis reveals that circular economy practice in agriculture — specifically the conversion of organic waste streams into productive inputs — generates a dual dividend: it reduces operating costs by replacing purchased inputs with internally produced ones, and it creates environmental value by diverting waste from landfills, reducing synthetic chemical use, and supporting soil carbon sequestration.

Velasco-Munoz et al. (2021) identified waste-to-resource conversion and nutrient cycling as core circular strategies for agricultural enterprises, and confirmed that these strategies reduce dependence on external input markets while improving soil health and long-term productive capacity. Donner et al. (2021), analyzing 39 circular agribusiness cases, found that price competitiveness of bio-based products relative to synthetic alternatives is a critical success factor — a condition that vermicompost satisfies, given that its primary feedstocks are organic wastes with negligible acquisition cost. Sharma et al. (2019) estimated that agricultural organic waste recycling reduces chemical fertilizer import and production costs, opens rural employment avenues, and delivers environmental benefits including reduced greenhouse gas emissions and land conservation.

The sustainability logic of circularity reinforces the differentiation logic analyzed in Section 4.2. An enterprise that converts local organic waste into farm inputs, eliminates synthetic chemicals from its production system, and grows produce in vermicompost-enhanced soil has an ecologically authentic claim to organic identity — a claim that is not dependent on third-party certification because it is visible and verifiable through direct producer-consumer relationship. By improving soil health through vermicompost application, the enterprise also makes a form of capital investment in soil fertility that compounds over time rather than depreciating — a long-term productivity asset that conventional input-dependent farming does not generate.

4.5 Community Value as Enterprise Contribution

The fifth strategic finding concerns the community value dimension of the vermiculture-based organic agribusiness model. The literature synthesis establishes that sustainable enterprise design — particularly in local food system contexts — generates social value that extends beyond the boundaries of the individual firm, and that this social value creation is not merely incidental to enterprise performance but is structurally embedded in the model's operational logic.

Jouzi et al. (2017) documented that organic farming enhances employment opportunities, social capacity, and food purchasing power within farming communities — outcomes that are amplified rather than diminished when the enterprise operates at local scale with direct community supply chains. Qiao et al. (2015) found that organic production projects created paid local employment, supported community organizing, and generated income opportunities for women. Ebabu et al. (2025), synthesizing 476 studies on sustainable entrepreneurship, confirmed job creation and community economic development as among the most consistently documented outcomes of sustainable enterprise in the agricultural and green economy sectors.

The vermiculture system adds a specific community value dimension that conventional organic farming models do not share: organic waste diversion. Small agricultural enterprises operating vermiculture systems contribute to local waste reduction by converting organic household, market, and agricultural waste into productive inputs rather than allowing it to accumulate in public spaces, water bodies, or informal dump sites — an environmental outcome of direct relevance to community health and municipal waste management in peri-urban and rural Southeast Asian settings. The community value argument, carefully stated, is that the vermiculture-based organic agribusiness model is designed in a way that makes community benefit a structural output rather than a voluntary add-on.

4.6 The Proposed Vermiculture-Based Organic Agribusiness Framework

The five thematic findings synthesized above are not independent analytical conclusions. They are structurally interconnected components of a single enterprise system whose coherence derives from the logical relationships among them. The integrated framework presented here formalizes those relationships into a model that is analytically grounded, strategically actionable, and applicable to local enterprise development in Southeast Asian and comparable emerging-economy contexts.

The framework organizes the vermiculture-based organic agribusiness enterprise as a system with three functional layers and two value output streams.

The production layer comprises the enterprise's core input and output operations. Organic waste — sourced from household, market, agricultural, or community origins — enters the vermiculture and vermicomposting system, where earthworms convert it into vermicompost. Vermicompost is applied to farm soil, improving physical, chemical, and biological soil properties and supporting organic crop production. The result is a flow of organically produced fruits and vegetables with demonstrable health, safety, and ecological attributes. This layer is circular in design: waste enters, vermicompost is produced, crops are grown, and the organic residues of crop production re-enter the waste stream as new vermicomposting feedstock.

The market layer comprises the enterprise's value realization operations. Organically produced differentiated produce is communicated, priced, and distributed through a portfolio of local market channels — direct household selling, farmers' markets, local retailers, community-supported agriculture arrangements, and institutional buyers. Channel selection and management are guided by the principles of volume-channel matching, marketing skill development, perishability management, and relationship investment with buyers. The premium pricing enabled by organic differentiation and local identity is the primary revenue mechanism of this layer.

The value capture layer comprises the two streams of value that the enterprise generates and distributes. Enterprise value — revenue, cost control through internal input production, margin sustainability, and competitive positioning through differentiation — is the commercial return that sustains the enterprise. Community value — local employment, income generation, organic waste diversion, and ecological stewardship — is the social and environmental return that extends beyond the enterprise boundary and constitutes the model's contribution to community and local development outcomes.

The structural logic connecting the three layers is reinforcing rather than sequential. The production layer's circular input logic reduces the cost base that the market layer must recover, making premium pricing commercially viable rather than commercially necessary. The market layer's differentiation premium validates the production layer's organic practice and incentivizes continued investment in vermicompost quality. The value capture layer's community benefits reinforce the enterprise's social legitimacy, support local buyer trust, and contribute to the broader ecosystem of community support that sustains the production layer's operational continuity. The proposed framework does not claim universal applicability. Its realization in any specific location requires site-specific assessment of organic waste availability, land suitability, local market demand, labor cost structure, and institutional support environment.

5. Discussion of Findings

5.1 Implications for Sustainable Entrepreneurship Theory

The integrated framework proposed in this paper carries several theoretical implications for sustainable entrepreneurship as a scholarly field. The most significant is the demonstration that circular economy logic and sustainable enterprise design are not only compatible with commercial viability in small agribusiness contexts but are structurally reinforcing of it. Much of the sustainable entrepreneurship literature has wrestled with what is sometimes framed as the tension between social-environmental mission and commercial performance — a tension that implies trade-offs between doing good and doing well. The vermiculture-based organic agribusiness model, as analyzed in this paper, does not exhibit that tension at the design level. The same operational decisions that generate environmental benefit — waste valorization through vermiculture, elimination of synthetic chemicals, soil health investment through organic amendment — also reduce input costs, improve product quality, and strengthen market positioning.

This finding is consistent with Rosario et al.'s (2022) argument that sustainable entrepreneurship represents an alignment rather than a compromise among economic, ecological, and social objectives — but it advances that argument by grounding it in the specific operational and strategic mechanisms through which alignment is achieved. The framework also contributes to the theoretical understanding of community value creation within enterprise design. As Ebabu et al. (2025) established through systematic review, the social impacts of sustainable entrepreneurship — job creation, income generation, community resilience — are among the most consistently documented outcomes of this class of enterprise. The vermiculture-based agribusiness model demonstrates that these social outcomes can be embedded in the operational logic of a commercially motivated small agribusiness through deliberate enterprise design, without requiring social enterprise legal structures, philanthropic intent, or subsidy mechanisms.

5.2 Relevance for Southeast Asian and Emerging-Market Agribusiness Contexts

The framework developed in this paper holds particular relevance for Southeast Asian local agribusiness development for reasons that are structural rather than merely geographic. The conditions that the model is designed to address — small land scale, high input cost exposure, market access fragmentation, consumer food safety concern, organic waste management challenges in peri-urban areas, and the need for enterprise models that generate community as well as private value — are characteristic features of smallholder agricultural enterprise across the Philippines, Vietnam, Indonesia, Thailand, and comparable economies in the region.

The Vietnamese evidence reviewed in Section 2.4 demonstrated that short food supply chain participation under developing-economy conditions can stabilize farmer incomes, improve environmental practices, and generate social equity outcomes. The Sri Lankan evidence from Hansika et al. (2021) showed that a direct organic farmers' market achieved simultaneous economic, social, and environmental sustainability. Li et al.'s (2021) finding that Asian willingness-to-pay estimates for organic and sustainable food products are comparable to European levels challenges the assumption that organic premiums are a wealthy-economy phenomenon not transferable to Southeast Asian markets. Rising urban middle-class populations, post-pandemic health consciousness, and growing awareness of food safety risks from conventional agriculture are structural demand drivers in the region that provide a genuine and expanding market basis for the differentiation strategy embedded in the proposed framework.

5.3 Practitioner and Institutional Implications

For small agricultural entrepreneurs, the framework provides an organizing logic for enterprise design decisions that are often made in isolation: input sourcing, production method, product positioning, channel selection, and community relationship management. The framework's central practical message is that these decisions are interconnected and that coherence among them — designing the enterprise so that each decision reinforces rather than contradicts the others — is the mechanism through which sustainable commercial performance is achieved. An entrepreneur who installs a vermiculture system but continues sourcing synthetic fertilizers has not adopted the model. An entrepreneur who produces organically but sells through commodity intermediaries without price differentiation has not realized the model's commercial potential.

For local government units, agricultural extension services, and community development agencies, the framework identifies several specific intervention points where institutional support can unlock enterprise viability without creating dependency. Training in vermiculture setup and management, facilitation of organic waste collection networks, support for local farmers' market establishment, assistance with organic product communication,

and inclusion of local organic producers in institutional procurement channels are all interventions that address the adoption barriers identified in the literature while respecting the commercial logic of the enterprise model. For training institutions and agricultural education programs, the framework suggests that integrated curricula should treat vermiculture technology, organic production management, product marketing, local market strategy, and circular economy principles as a coherent body of practical knowledge.

5.4 Boundaries of the Analysis

The analytical boundaries of this paper must be stated with equal clarity to the claims it makes. The framework proposed here is conceptually coherent and literature-grounded, but it is not a feasibility determination. It does not establish that any specific vermiculture-based organic farm venture will be financially viable; that determination requires site-specific market research, financial modeling, production planning, technical assessment, and risk evaluation that fall entirely outside the scope of conceptual thematic synthesis. Entrepreneurs and institutions that use this framework as a planning tool must supplement it with empirical investigation of the specific conditions — consumer demand levels, input availability, land suitability, labor cost, and competitive landscape — that prevail in their particular locations.

Furthermore, the framework's integrative logic assumes a minimum level of management capacity, market development, and institutional context that may not be uniformly present across all local enterprise settings in Southeast Asia. In locations where local consumer markets for organic produce are nascent, where organic waste collection infrastructure is absent, or where access to vermiculture training is unavailable, the adoption barriers identified by Rastegari et al. (2023) may be sufficiently substantial to delay or prevent the model's realization regardless of its conceptual coherence.

6. Conclusions and Recommendations

6.1 Conclusions

This paper set out to develop a thematic framework for understanding vermiculture-based organic farming as a sustainable agribusiness model for local enterprise development. Drawing on a systematic synthesis of peer-reviewed literature across five thematic domains, the paper has proposed an integrated agribusiness framework organized around three functional layers and two value output streams.

The analysis yields four principal conclusions. First, vermiculture functions as a form of input innovation that structurally alters the cost architecture of small organic farm enterprise by substituting internally produced organic soil amendments for externally purchased synthetic inputs. Second, organically produced fruits and vegetables grown through vermiculture-enhanced systems carry a demonstrable and commercially realizable value proposition in local consumer markets, including in Asian emerging-economy contexts. Third, the circular economy logic embedded in the vermiculture system generates a dual dividend of cost efficiency and environmental credibility that is structurally self-reinforcing. Fourth, the community value outputs of the model — employment generation, local income circulation, organic waste diversion, and ecological stewardship — are structural consequences of the model's operational design rather than voluntary social contributions.

Taken together, these four conclusions support the paper's central argument: that vermiculture-based organic farming constitutes a conceptually coherent and strategically defensible agribusiness model for local enterprise development. The model's coherence derives from the reinforcing relationships among its components, not from the independent performance of any single element.

6.2 Recommendations

For small agricultural entrepreneurs, the primary recommendation is to treat the model as an integrated enterprise system rather than a collection of independent practices. Installing a vermiculture unit without redesigning input sourcing, product positioning, and market channel strategy leaves most of the model's strategic value unrealized. Enterprise design should begin with the circular input logic, proceed through product differentiation strategy, and extend into deliberate local market channel development — with each decision made in awareness of its relationship to the others.

For local government units and community development agencies, the recommendation is to identify and support the specific adoption barriers — access to vermicomposting training, organic waste feedstock collection, local market infrastructure, and institutional procurement inclusion — that prevent otherwise viable small organic farm enterprises from reaching commercial operation. Targeted support at these bottlenecks is likely to generate greater enterprise development impact than generalized agricultural subsidies.

For agricultural training institutions, the recommendation is to develop integrated curricula that treat vermiculture technology, organic production management, product marketing, local market strategy, and circular economy principles as a coherent body of practical knowledge rather than as separate technical modules. For future researchers, the most important recommendation is to generate empirical evidence on vermiculture-based organic agribusiness enterprise performance in Southeast Asian contexts — specifically in the Philippines, Vietnam, Indonesia, and Thailand — where the structural conditions addressed by the model are most directly present. Longitudinal case studies, comparative channel analyses, and financial modeling studies that specify the conditions under which the model reaches commercial viability under local cost and price conditions would each make substantial contributions. For pilot project designers, initial implementation should be treated as a structured learning opportunity to test local market demand conditions, vermicompost production requirements, and channel management challenges that are not resolvable through conceptual analysis alone.

6.3 Closing Statement

Sustainable local agribusiness development in Southeast Asia requires enterprise models that are simultaneously commercially viable, environmentally responsible, and socially contributive — models that small entrepreneurs can actually build and manage with accessible resources, in local markets, under the institutional conditions that actually prevail. The vermiculture-based organic agribusiness framework proposed in this paper is offered as one such model: analytically grounded, strategically coherent, and designed for the conditions where it is most needed. Its realization in specific locations will require empirical validation, institutional support, and entrepreneurial commitment that go well beyond what any conceptual paper can provide. What this paper contributes is the integrated framework within which those practical efforts can be organized, evaluated, and refined — a foundation from which evidence-based agribusiness development can proceed with greater strategic clarity than the fragmented literature has previously made possible.

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