International Journal of Innovative Research and Scientific Studies, 8(5) 2025, pages: 672-682

IJIRSS
International Journal of Innovative Research & Scientific Studies

**ISSN:** 2617-6548

URL: www.ijirss.com

# Sustainable entrepreneurship: Insight from a case study of hydroponic business in Urban Indonesia

Glenn Pardede[1*], Rosdiana Sijabat[2], Rizaldi Parani[3], Jacob Donald Tan[4]

[1,3,4]*Management, Faculty of Economics and Business, University of Pelita Harapan, Tangerang, Indonesia.*
[2]*Atma Jaya Catholic University of Indonesia, Indonesia.*

Corresponding author: Glenn Pardede (*Email: 01617200003@student.uph.edu*)

## Abstract

Sustainable Entrepreneurship (SE) is increasingly recognized as a promising field for addressing interconnected economic, social, and environmental challenges through entrepreneurial action. While SE remains underexplored, with much of the literature shaped by Global North contexts, little is understood about how it unfolds in the Global South, especially in the urban agricultural sector. This paper offers insights from a holistic, multiple-case study of hydroponic entrepreneurs in the urban region of Jakarta, Indonesia (Jabodetabek), examining how SE emerges in real-world contexts, resource-constrained settings. Guided by a constructivist paradigm, the study is based on data collected through in-depth interviews, field observations, and documentation. We employ thematic analysis and theoretical interpretation across four levels: individual, process, firm, and environment. There are eight identified themes, leading to three propositions that contribute to understanding SE in practice. The findings reveal that SE among hydroponic entrepreneurs in Jabodetabek emerges from personally meaningful concerns and evolves through adaptive, relational practices shaped by local conditions, with sustainability gradually represented as a contextual response, rather than a premeditated strategy. This study contributes to SE theory by introducing the concept of SE emergence through cross-level dynamic interactions across process and firm levels, with the individual at the core intersection, all embedded within the environmental context in which it takes place.

**Keywords:** Global South, Hydroponics, Jabodetabek, Sustainable Entrepreneurship, Urban Agriculture.

**DOI:** 10.53894/ijirss.v8i5.8809
**Funding:** This study received no specific financial support.
**History: Received:** 22 May 2025 / **Revised:** 26 June 2025 / **Accepted:** 30 June 2025 / **Published:** 24 July 2025

**Competing Interests:** The authors declare that they have no competing interests.
**Authors' Contributions:** All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
**Transparency:** The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
**Publisher:** Innovative Research Publishing

## 1. Introduction

Sustainable Entrepreneurship (SE) is emerging as a distinct field at the intersection of entrepreneurship and sustainability [1-3]. Rather than treating profit and sustainability as opposing goals, SE positions them as interdependent. It reframes entrepreneurship as a response to global challenges by advancing viable business models that generate social and environmental values while pursuing business success. As a nascent concept, SE continues to gain attention in academic discourse. Yet despite this growth, empirical understanding of how SE unfolds in practice remains limited, particularly in the Global South [4, 5].

While SE literature continues to expand, much of it remains anchored in perspectives from developed economies [6]. A persistent imbalance is evident in recent reviews [7], which highlight how academic production from the Global North continues to disproportionately shape the field. This analysis of SE publications identifies a notable underrepresentation of Global South contexts and calls for the development of inclusive frameworks that better reflect diverse environmental conditions. The imbalance risks reinforcing assumptions that SE patterns observed in the Global North are universally applicable.

This disparity is also evident in the urban agriculture sector, which combines environmental concerns with local food security and grassroots innovation [8]. Despite this, the entrepreneurial journeys of those engaged in urban agriculture, in which sustainability is practiced informally on a day-to-day basis, remain underexplored. To better understand how social entrepreneurship unfolds in this context, we focus on hydroponic entrepreneurs in the Jakarta Metropolitan Area (Jabodetabek). As a soilless cultivation method, hydroponics allows farmers to grow fresh vegetables locally while using less water and reducing chemical runoff and other forms of environmental degradation [9, 10]. In urban areas with limited land, hydroponics offers higher productivity and lower $CO_2$ emissions compared to conventional farming, making it a meaningful contributor to environmental goals [11].

In Jakarta and other Indonesian cities, hydroponic farming has emerged as an adaptive response to food insecurity and job loss during disruptive periods such as the COVID-19 pandemic [12-14]. This shift has prompted new entrepreneurial activity, which, through its contributions to sustainability, qualifies as a form of SE [15] even though the entrepreneurs themselves may not frame their business in such terms [16, 17]. Yet, their work contributes meaningfully to the triple bottom line (TBL), generating economic value, supporting local food systems, and reducing environmental impact. The practices of Jabodetabek's hydroponic entrepreneurs offer valuable insights into investigating SE as it emerges within the conditions of the Global South.

Through a case study approach to the hydroponic business, this research aims to generate context-sensitive insights into how SE is experienced and managed in everyday entrepreneurial life. In the following sections of the paper, we review relevant literature on SE and urban agriculture in the Global South, outline the methodological approach, and present key findings from the case study. In the closing section, we discuss the theoretical contributions and conclude the paper with implications and directions for future research.

## 2. Literature Review

### *2.1. Entrepreneurship Foundations*

Entrepreneurship has long been examined through the lens of opportunity, innovation, and market dynamics. These classical perspectives provide the foundation upon which newer forms of entrepreneurship, including sustainable entrepreneurship (SE), have developed by extending the focus beyond economic value to include social and ecological dimensions. Classical theorists laid the groundwork for understanding entrepreneurial action, beginning with Contreras and Dornberger [6], who viewed entrepreneurs as risk-bearers purchasing inputs at certain prices and selling outputs at uncertain ones. Kulak et al. [11] further emphasized uncertainty as the defining condition of entrepreneurship, arguing that entrepreneurs assume responsibility for non-insurable risks. Schaltegger and Wagner [1] introduced the idea of entrepreneurs as agents of 'creative destruction,' bringing innovation that disrupts market equilibrium. Later, Kulak et al. [11] proposed the process of entrepreneurship as equilibrium restoration, asserting it as a market equalizer through the entrepreneur's alertness to profit opportunities that arise from disequilibria. These foundational theories frame entrepreneurship as a key economic driver and underpin later shifts toward structured, process-oriented models of opportunity recognition.

By the 1980s, entrepreneurship research shifted from focusing on who entrepreneurs are to what they do. This shift, marked by Fajrina et al. [8] led to process-oriented approaches like Segal et al. [18], who emphasized discovering, evaluating, and exploiting opportunities. They highlighted how opportunity recognition is shaped by prior knowledge, motivation, and context. Cognitive perspectives complemented this view by focusing on how entrepreneurial intentions are influenced by traits, motivations, and awareness [18], connecting sustainability awareness to intention formation. Sisodia et al. [9] extended this into the SE domain, suggesting that intentions emerge when individuals are aware of threats to valued elements and believe they can make a difference.

### *2.2. Sustainability*

Sustainability, as defined by Bocken et al. [16] rests on two principles: meeting present needs without compromising future generations and recognizing limits in resources and institutions. This foundational view has evolved into the widely accepted three-pillar model: environmental, social, and economic, where sustainability is achieved when all domains are aligned within a systems perspective. This shift reframes sustainability as maintaining resilience and justice over time, influencing global frameworks such as the SDGs. Within this evolving discourse, businesses, particularly entrepreneurs, are increasingly seen as key actors in sustainability transitions. Rather than merely mitigating harm, sustainability-driven

entrepreneurs create systemic value through innovative solutions that address root challenges [19]. This sets the stage for SE, where opportunity, innovation, and value creation are tied to long-term ecological and social well-being.

## 3. Materials and Methods

As our aim is to explore entrepreneurs' experiences as they navigate the complex social, economic, and environmental dimensions of their hydroponic ventures, this research adopts a constructivist paradigm to capture the subjective and socially constructed realities. As Schaltegger and Wagner [1] note, the constructivist paradigm holds that reality is not an objective entity to be discovered but rather is constructed through human experience and interaction. The research was conducted using a qualitative research design, utilizing a multiple-case approach, which is suitable for examining complex phenomena in real-world settings [20].

### *3.1. Research Design*

This research employed a holistic multiple-case design. The research process comprised three sequential phases: (1) define and design, (2) prepare, collect, and analyze, and (3) conclude. The unit of analysis was sustainable entrepreneurship, with cases consisting of hydroponic businesses in Jabodetabek. The key informants within the enterprises were the (co-)founders, who possessed the most knowledge about the entrepreneurial journey of the business, from recognizing opportunities to transforming them into viable enterprises and expanding to their current state. The selection of cases was based on purposive sampling with three criteria.

1. They must operate on a commercial scale between 10,000 and 750,000 planting holes; large enough to indicate business activity but not yet at the scale of large enterprises.
2. They must have been in operation for at least three years, allowing sufficient time for the venture to evolve and provide insights into sustainable entrepreneurship processes.
3. They must be located within the Jabodetabek area, Indonesia, as the study area, representing a complex urban region in a developing country where sustainability practices are increasingly relevant.

A pilot study conducted in April 2024 helped refine the sampling criteria and familiarize the researcher with the hydroponics field and industry dynamics in Jabodetabek. This preparatory phase supported the qualitative approach by enabling a deeper understanding of how participants interpret their experiences, thereby informing both recruitment and data collection strategies. Based on the case selection criteria, four hydroponic businesses were selected: Toni, Dudi, Joko, and Anwar.

Data collection involved three methods: in-depth interviews, field observation, and document analysis (e.g., business plans, media reports). Data analysis employed the editing analysis style [20] to inductively analyze interview data, supported by Contreras and Dornberger [6] qualitative strategies. The analysis unfolded in five iterative steps: transcription, initial coding (word-by-word, line-by-line, incident-by-incident), focused coding into categories, theoretical dialogue to generate propositions, and verification through constant comparison. NVIVO software aided coding consistency, and triangulation across interviews, field notes, and documents ensured analytical depth. Insights were theoretically generalized to illuminate how SE is experienced and managed in Jabodetabek's hydroponic ventures.

Ethical safeguards were applied throughout the study. Participants were informed about the research purpose, and consent was obtained before each interview. Participation was voluntary, with the right to withdraw at any time. Real business names were used only with explicit permission, and all data were handled respectfully. Interview recordings, field notes, and documents were stored securely in password-protected folders. Photographs were taken and used only with prior consent and clear explanation of their intended use. The study upheld transparency, respect, and accountability, consistent with ethical standards for qualitative research.

## 4. Results and Discussion

This section has two parts. The first presents eight themes derived from interviews, observations, and informal interactions, showing how informants experienced SE. The second interprets these cross-case themes across four analytical levels to develop conceptual propositions. This approach reflects a constructivist stance, where empirical insights and theory emerge through interpretive dialogue.

## 5. Findings

### *5.1. Theme 1: Starting from Personal Concerns*

All informants entered hydroponic entrepreneurship due to personal motivations rather than strategic business goals. Anwar aimed to provide healthier dietary options for his wife. Dudi was driven by dissatisfaction with his stressful job. Toni was inspired by his wife's passion for gardening and the idea of turning unused space at home into a shared project. Joko, out of boredom, discovered a viral hydroponic video that sparked his curiosity and led to hands-on experimentation during the pandemic. Despite the differences, all began with hydroponics as a personal solution, not a commercial strategy. Sustainability was not initially part of their goals.

Finding: Informants began their ventures as responses to personally or family-meaningful problems, not necessarily strategic business intentions.

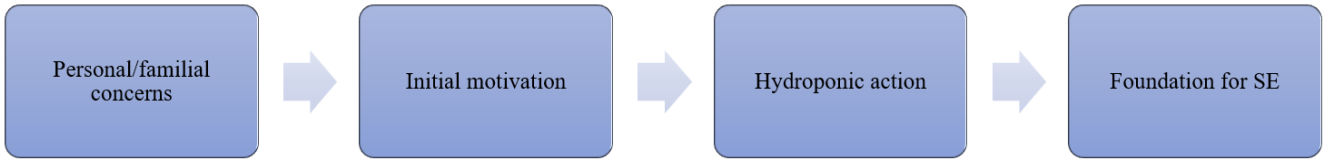


**Figure 1.**
Personal Concerns as the Starting Point for Hydroponic Ventures.

*5.2. Theme 2: Recognizing Opportunity in Everyday Settings*

None of the informants set out with a deliberate plan to build a business. Instead, they began to see hydroponics as a viable opportunity through casual interactions and unsolicited interest. Joko's neighbors praised his produce and began buying it; Anwar saw demand emerge from his wife's health community; Toni and Dudi found local buyers for what started as household crops. In all cases, the opportunity was not strategically sought but revealed through everyday feedback and social validation. Informants gradually reinterpreted their personal practices as economically meaningful in response to interest, encouragement, or demand from their surroundings.

Finding: Informants recognized business opportunities not through deliberate search but through continuous interaction with their environments, where small personal actions were met with interest, affirmation, or encouragement.

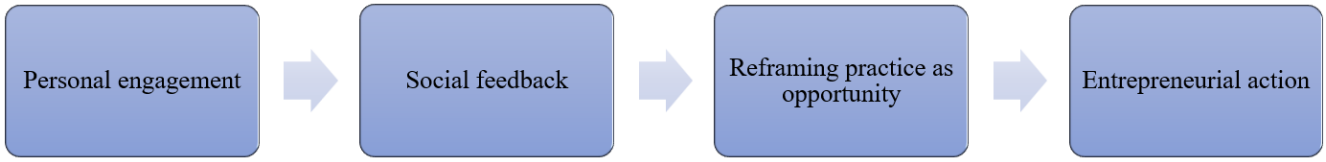


**Figure 2.**
Business Opportunities were Recognized in Everyday Life.

*5.3. Theme 3: Building Viable Practice Through Experimentation*

Before viewing hydroponics as a business, all informants engaged in personal, self-taught trials to test whether the method worked. With no formal training or agricultural background, they learned from peers, online resources, and direct experimentation using small setups at home. These experimentations aimed to prove the technical and economic feasibility; first growing for personal use, then sharing surplus with neighbors. Interest from these early recipients sparked initial sales, which gradually evolved into structured practices. Business models emerged not from formal planning, but from learning-by-doing and feedback loops embedded in everyday practice.

Finding: The business models were not designed upfront but emerged through experimentation. Informants initially engaged in hydroponics to test whether the method could work technically and economically, and only after confirming these aspects did structured practices start to take shape.

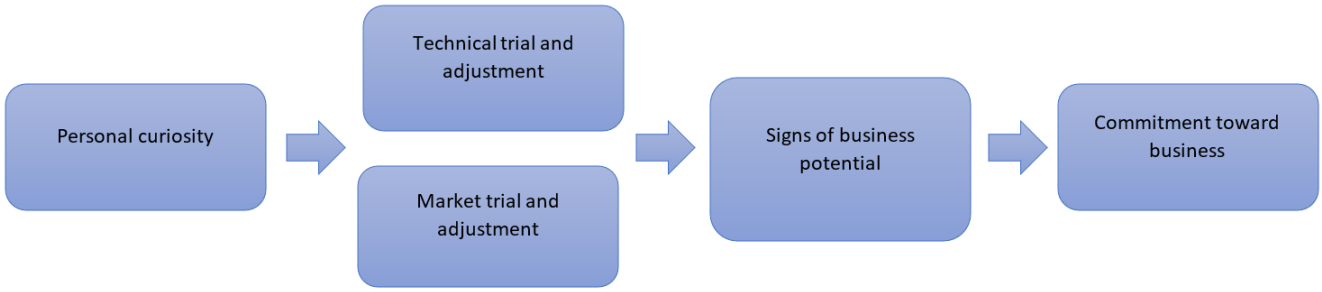


**Figure 3.**
Viable Practices Emerged through Experimentation.

*5.4. Theme 4: Sustainability Emerging in Practice*

Sustainability was not a predefined goal for the informants but emerged organically through practice. As they managed their hydroponic systems, they observed environmental benefits such as reduced pesticide use, efficient water consumption, minimal waste, and adaptability to limited or flood-prone spaces. These outcomes were not driven by sustainability discourse but arose from problem-solving in daily routines.

Social benefits also developed informally. Informants offered training, shared resources, and created low-barrier job opportunities. They hosted student interns, mentored youth, and supported community members through small but meaningful gestures. These contributions were not planned as social programs but grew out of relational values and neighborhood engagement. Meanwhile, on the economic side, as informed by the case selection, these ventures were already viable businesses. While the path toward sustainability was not premeditated, their practices supported resource efficiency and community value while maintaining commercial viability.

Finding: Environmental and social dimensions of sustainability emerged simultaneously and organically through informants' everyday practices, not as consciously planned strategies but as practical outcomes shaped by relational values in everyday conditions.

### *5.5. Theme 5: Building Trust While Meeting Needs*

As their ventures developed, informants shaped businesses around trust and care, especially toward local customers who were often neighbors, friends, or community members. Selling vegetables became a relational act, guided by empathy and balance rather than profit. They tailored products, stabilized prices, and maintained quality not to maximize profit, but to serve others while preserving their own well-being and autonomy. From customizing crops for health-focused communities to sharing roles with family members and limiting growth for personal time, informants treated customer trust as an integral part of their ventures. Their businesses were designed to meet both external needs and internal values such as dignity, health, and a manageable livelihood.

Finding: Informants designed their ventures not purely as commercial efforts but as trust-based relationships, balancing the needs of others with their own needs for dignity, health, and a manageable way of working.

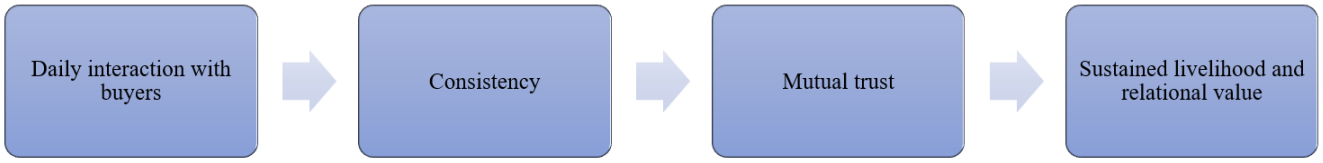


**Figure 4.**
Formation of Trust-based Value Exchange.

### *5.6. Theme 6: Managing Costs with Ingenuity*

As their ventures matured, informants became resourceful in managing costs through hands-on experimentation and adaptive problem-solving. Instead of formal budgeting tools, they modified systems using simple, locally available materials. From designing energy-efficient irrigation, reusing waste, automating processes, and avoiding unnecessary purchases like branded packaging or imported media, these choices were not driven by innovation for its own sake, but by practicality, autonomy, and a desire to keep operations affordable and replicable. Their response to constraints was not innovative, but rather a pragmatic response, one shaped by the need for efficiency and minimal resource expenditure.

Finding: Informants managed costs through practical ingenuity by using adaptive, resource-efficient methods suited to their specific conditions and guided by principles of simplicity and sufficiency.

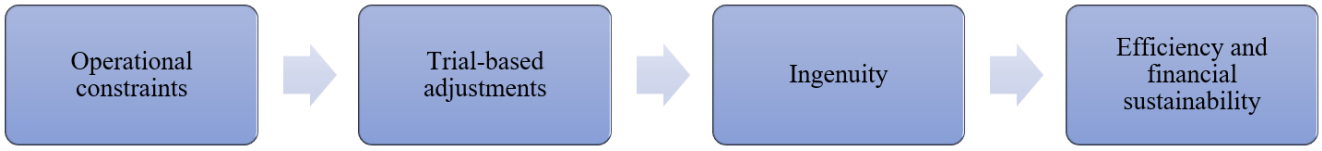


**Figure 5.**
Managing Cost Through Creative and Context-Aware Solutions.

### *5.7. Theme 7: Managing with Simplicity*

As their operations stabilized, informants adopted informal, low-pressure management systems that matched their personal capacities. Instead of formal tools, they relied on simple routines dividing tasks with family, standardizing packaging and pricing, limiting crop varieties, and maintaining manual records. These approaches were not shortcuts but deliberate strategies to sustain manageable, efficient operations aligned with their life balance and values.

Finding: Informants maintained operational control by embracing simple management strategies. They deliberately chose methods that matched their capacity, values, and desire for balanced routines.

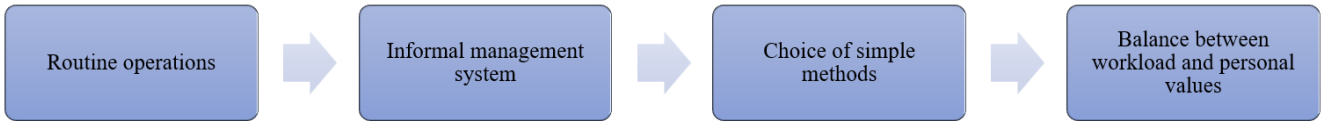


**Figure 6.**
Simple Management Strategies Aligned with Personal Capacity and Values.

### *5.8. Theme 8: Expanding Gradually and Organically*

After achieving operational stability, informants expanded their ventures across three dimensions: markets, operations, and services. They did this not through formal planning, but through responsive decisions shaped by growing confidence and opportunity. Market expansion included supplying restaurants, online buyers, and partner brands. Operationally, they diversified crops, reclaimed underused land, and scaled up their systems. Service expansion emerged as they began hosting interns, providing training, and engaging with community programs. These expansions were not strategic blueprints but organic outcomes of visibility, experience, and readiness.

Finding: Informants expanded their businesses across markets, operations, and services in ways that emerged from growing stability, visibility, and practical readiness.

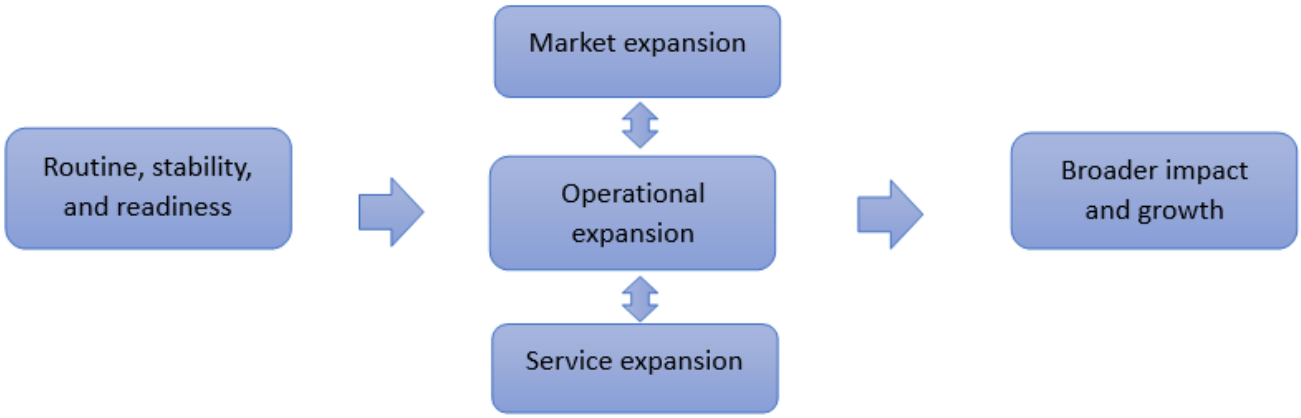


**Figure 7.**
Expansion as a Response to Practice-Based Readiness.

*5.9. Individual-Level Insight*

The informants' engagement in hydroponics did not begin with strategic market intent, a theme well documented in entrepreneurship literature [9] but as a response to deeply personal concerns. Their sensitivity to unmet needs in daily life reflects entrepreneurial cognitive alertness, where individuals perceive problems as opportunities [11] describe entrepreneurs as those who act on gaps, unlike traditional views that emphasize market scanning [7]. The informants' opportunity recognition was inward-facing, driven by personal needs rather than external cues.

This aligns with Segal et al. [18] who argue that entrepreneurial motivation often stems from a desire for autonomy and personal fulfillment. Initially, the informants did not see hydroponics as a contribution to sustainability; over time, social and environmental benefits emerged [2] but here was incidentally through practice. Their ventures evolved from addressing personal needs into opportunities for economic and community engagement, reflecting the "insurgent path" of SE described by Muñoz and Cohen [17] where sustainability emerges from action, not intention. Although here, it is evident that their actions were oriented toward self-serving goals rather than broader societal contribution (*change one's own world*, instead of *changing the world*).

Customer relationships were rooted in trust and mutual care, echoing Contreras and Dornberger [6] view of trust as a social mechanism for cooperation. Yet, this relational trust also constrained scalability: ventures remained closely tied to the entrepreneurs' personal presence, highlighting the tension between personal commitment and business growth [1].

Proposition 1: Sustainable entrepreneurship can emerge from a personal problem-solving orientation grounded in personally meaningful concerns, without entrepreneurial intention or predefined sustainability goals.

This insight suggests that individual-level triggers should not be seen as deviations from SE but as legitimate alternative origins. This challenges normative expectations in SE literature that ventures must begin with explicit sustainability intentions. Instead, sustainability can emerge through personal trajectories shaped by identity, care, and lived experience. The contribution to SE theory is threefold. First, SE can originate without sustainability logic, arising instead through personal meaning and everyday practice. Second, opportunity recognition may be better understood as situated responsiveness, where entrepreneurs act on problems as they encounter them rather than predefining them. Third, the insurgent path [17] is expanded beyond ideological resistance to include relational, embedded engagement. This proposition invites further inquiry into how inward-facing, self-responsive entrepreneurial processes evolve into sustainability pathways and how they interact with broader dynamics across the SE journey.

*5.10. Process-Level Insight*

In the framework of SE, opportunities for achieving economic profit are viewed within the context of social and environmental value advancement [17]. Hence, the process of SE discusses how such opportunities unfold, with the 'how' describing the mechanisms of action and development, and the 'what' referring to the defining features of entrepreneurial practice. These aspects will analyze the seven main themes located in the data, examining how each theme evolves over time and what qualities influenced their development. This strategy aims to highlight the processes by which SE was manifested and transformed within the lives of the informants.

*5.11. The How: Developmental Trajectories Over Time*

Comparing the experiences of the hydroponic informants to the Convergent Model demonstrates how their development process cannot be strictly adhered to the scoped definitional stages. While some of the phases do exist, their execution was neither linear nor intentional. In the initial phases, the informants shifted from individual concerns to actual hands-on workshops, blending problem identification with opportunity recognition.

This phenomenon, initiated by amateurs, stripping stage trial after stage trial without any designated set-out guidelines, resonates with the Effectuation theory [18], which is centered around goal formation and evolution through active

participation and interplay. As Moya-Clemente et al. [15] likewise argue, entrepreneurial judgment develops through iterative processes of experimentation instead of following predetermined stages. The informants' experiences do illustrate this notion, since their experiments proceeded without a tangible final goal, amplifying the messiness between the stages of their entrepreneurial cycle. The following table offers a summary of how each informant framed hydroponics as an opportunity.

**Table 1.**
How Hydroponic Informants Reframed Personal Concerns into Entrepreneurial Opportunities.

| Hydroponic informants | Identified Personal Concerns | Opportunity Framed Through Hydroponics |
|---|---|---|
| Anwar | Limited access to pesticide-free vegetables | Used hydroponics to produce healthy, pesticide-free vegetables. He began by experimenting to grow vegetables for his family (particularly his wife) and later expanded to serve a broader community with similar needs for healthy produce. |
| Dudi | Workplace discomfort | Established a hydroponic business as a potential new occupation that offered a more natural, peaceful, and self-managed work environment. He experimented to test his ability to grow vegetables. Early harvests were supplied to a neighbor's diner. |
| Toni | Need for meaningful utilization of the household for the family | Built a hydroponic installation in the yard of the Sawangan house as a meaningful way to utilize the land for the family. He experimented after the installation was built to test his ability to grow vegetables. The produce was initially intended for sharing with neighbors. |
| Joko | Boredom and influence from online hydroponic influencers | Replicated a viral hydroponic installation as a personal challenge and productive project. He was motivated by curiosity and a desire to test its feasibility. Produce from early trials was sold to nearby neighbors. |

The development of the business ventures by the hydroponic informants was not a straightforward step-by-step process; it was rather fluid and iterative. Instead of one attempting to detect a problem and subsequently strategize a solution, an informant oscillates between sensing, experimenting, and realizing their potential to generate value. Their approach, which seems practical, is aligned with Effectuation theory [1] as opportunities were realized not through goals or plans, but through action and engagement.

In the beginning, the economic returns primarily catered to the household's consumption needs, but gradually, some surplus produce was made available to the community, thus enabling the potential clientele to be identified. Through this process, social and environmental aspects were naturally captured, with the informants' motives transforming from personal to community concerns.

Unlike the Convergent Model, with which the sequential construction of sustainability goals tends to amalgamate, the SE process of the informants illustrates a blend of economic, social, and environmental factors. It depicts integration that is simultaneous, rather effortless. The informants had a relatively freehand approach to their SE framework. They demonstrated a nonlinear, open-ended approach that allowed for gradual, trust-based, informal marketing schemes to foster customer relationships. This process illustrates the emergent, situation-specific characteristic of SE that focuses on learning through action and constant adjustment.

*5.12. The What: Recurring Qualities of SE Practice*

The developmental process of SE among the hydroponic informants was characterized by five recurring qualities: emergent intentionality, practice-led opportunity formation, contextual embeddedness, non-linear adaptation, and layered meaning-making. These qualities highlight that SE did not emerge from a predefined strategy but evolved organically through personal concerns and ongoing engagement.

The informants began with personal issues such as health, food safety, and land use, and gradually transformed these into entrepreneurial opportunities through iterative experimentation. This process was not linear but marked by cycles of trial and feedback, with entrepreneurial actions unfolding through practice rather than strategic planning, aligning with Effectuation theory [9] and path creation theory [8]. Context played a crucial role, shaping the pace and direction of their ventures, and the informants' adaptation was consistently driven by core values such as family well-being and community contribution. Sustainability, therefore, emerged incrementally, not as a strategic goal but as a cumulative outcome of lived practice, reinforcing the view that SE is a fluid, context-sensitive process driven by personal values and everyday decisions.

Proposition 2: Sustainable entrepreneurship can develop through a dynamic loop of experiential and practice-led actions, rather than through sequential stages of venture creation.

This proposition contributes to SE theory in two important ways. First, it extends the understanding of SE by showing that sustainability can emerge through everyday practices, even without initial strategic intent (as discussed in Proposition 1). Second, it highlights how SE processes unfold through dynamic, relational feedback shaped by continuous interaction with personal contexts, environments, and lived narratives rather than through sequential or predefined blueprints. This aligns with processual perspectives in SE [17], particularly their emphasis on emotional engagement with enduring personal concerns. The findings indicate that models such as Belz and Binder [2], convergent models, which assume a

sequential and ordered integration of sustainability dimensions, may not fully capture the emergent and overlapping dynamics observed in this study.

*5.13. Firm-level Insight*

Most of the existing literature on SE tends to emphasize the integration of formally defined sustainability strategies into business models and organizational systems [1]. However, the informants in this study illustrate that sustainable practices can also emerge organically through informal structuring, adaptive routines, and responsive engagement with local realities rather than from predefined frameworks. These firms advanced not through rigid planning or governance, but through action: grounded in context, shaped by operational choices, and sustained through relationships.

The hydroponic ventures examined here did not rely on top-down approaches to organization. Instead, their internal structures evolved through negotiation, mutual understanding, and day-to-day adjustments. This aligns with Wahyuni [20] notion of 'organizing' as a fluid, ongoing process, and Schaltegger and Wagner [1] effectual logic, where goals are redefined based on available means and emerging conditions. In contrast to traditional SE models that assume deliberate sustainability integration from the outset, these ventures enacted sustainability through lived practice.

This adaptive, hands-on approach offers an alternative to the assumption that social or sustainable enterprises must be guided by formal strategies, institutionalized systems, or growth-oriented blueprints. These hydroponic ventures progressed through self-directed, relationally grounded systems that remained flexible and responsive to change. Sustainability, in this context, was not a fixed endpoint or framework, but a continuous, emergent practice shaped by context, relationships, and experiential learning. Such a model is especially relevant in resource-constrained or informal environments, where rigid structures may be impractical, and trust-based organizing becomes the foundation of sustainable enterprise.

Proposition 3a: Sustainable entrepreneurship can be maintained at the firm level through emergent routines, informal but resilient structures, and situated organizing principles that reflect adaptive, relational, and experiential logics, even in the absence of formal strategic systems or growth-oriented blueprints.

*5.14. Environmental-Level Insight*

SE research remains dominated by frameworks from the Global North, leaving Global South contexts underrepresented [3]. This study contributes to redressing that imbalance by showing how sustainability emerged in Jabodetabek through informal, adaptive practices shaped by institutional voids, fragmented infrastructures, and everyday constraints, which are conditions that correspond well to entrepreneurial ecosystems in the Global South [18].

Hydroponic entrepreneurs did not rely on formal sustainability plans or state-driven transitions. Instead, they responded to immediate challenges such as lack of land rights, water access, or public support through improvisation, relational trust, and resourcefulness. Sustainability was not a declared goal but an emergent outcome of actions like reusing materials, reducing pesticide use, and conserving water. These practices align with effectuation [9] and bricolage [2], highlighting how SE in constrained environments is built through means at hand and social embeddedness.

Operating in informal ecosystems, these entrepreneurs sustained their ventures through consistency, local ties, and informal communication (e.g., WhatsApp, *arisan* networks), rather than formal partnerships or institutional support. Their transitions toward sustainability were driven by necessity and care for community well-being, not strategic design. This affirms calls for deeper contextualization in SE theory [20] and positions the Global South as a generator of alternative entrepreneurial logics.

Proposition 3b: Sustainable entrepreneurship is actively shaped by the environmental context. Sustainable entrepreneurship is actively shaped by the environmental context. In Global South settings marked by institutional voids, fragmented ecosystems, and urban informality, SE emerges not through formal strategy but through adaptive engagement, relational organizing, and informal structuring in response to systemic uncertainty and scarcity. These dynamics act as enabling constraints that shape entrepreneurial pathways for sustainability.

*5.15. Merging Propositions 3a and 3b into a Unified Proposition 3*

Although propositions 3a and 3b were initially derived from different analytical levels (firm and environment), they ultimately describe interdependent dynamics of the same phenomenon. The informal, flexible, and relational organizing logic observed at the firm level (proposition 3a) was shaped by and responsive to the structural constraints of the environment (proposition 3b). These dynamics are not parallel but mutually constitutive. The entrepreneurs' reliance on relational trust, role flexibility, and responsive decision-making was not merely a preference but a necessary adaptation to systemic uncertainty and the lack of institutional support. In other words, the environmental constraints directly shaped the firm-level structures and organizing principles.

Moreover, both propositions revolve around the same core mechanisms: improvisation instead of planning, relational embeddedness instead of formal structure, resilience through flexibility rather than scale or efficiency, and pragmatic sustainability through routine action rather than strategy. This suggests that these two levels are inseparable, convergent drivers with the same underlying logic: that SE in the Global South is emergent, relationally organized, and shaped through adaptive engagement with structural constraints. For this reason, it is both analytically and conceptually appropriate to merge them into a single proposition.

Proposition 3: Sustainable entrepreneurship is a context-responsive practice, shaped by the environmental context where it happens.

*5.16. Cross-Level Dynamics in the Emergence of SE*

This study examined how SE unfolded across four interlinked levels: individual, process, firm, and environment, among hydroponic entrepreneurs in Jabodetabek. Rather than being shaped by isolated factors, SE emerged through recursive, cross-level interactions.

Across all levels, a consistent pattern is evident: SE did not begin with strategic goals or sustainability intentions but was triggered by personally meaningful concerns such as family health, lifestyle change, or spatial use (Proposition 1). These concerns initiated practice-led experimentation shaped by contextual feedback, gradually producing value that became embedded in routines and relationships (Proposition 2).

At the firm level, SE was sustained not by formal structures but by relational reliability, flexible roles, and informal organizing grounded in trust (Proposition 3a). These dynamics were not autonomous; they were shaped by an environment marked by institutional voids and infrastructural gaps.

In response, entrepreneurs adapted through bricolage and relational improvisation, using what was available to maintain operations and deliver sustainability outcomes (Proposition 3b). Together, these are expressions of the same logic: SE in the Global South emerges through context-responsive engagement with structural constraints (Proposition 3).

The findings address the three sub-research questions.

First, what factors contributed to the emergence of SE? SE was internally driven by personal concerns and sustained by adaptive routines and informal systems. Second, how did these factors interact? SE emerged through a dynamic loop: individual concerns informed experiments, which evolved into firm routines, shaped in turn by environmental constraints.

Third, why were these processes necessary? In the absence of formal institutions and strategic roadmaps, SE had to be improvised, relational, and grounded in local realities. These were not secondary responses, but the primary mechanisms through which sustainability was enacted.

In this view, SE is not a universal model to apply but a locally situated process to be enacted: adaptive, relational, and deeply embedded in place, identity, and lived experience. It redefines what best practices look like in the Global South, which are not strategic plans but context-responsive pathways shaped from the ground up.

The integrative insights are visualized in Figure 8, which illustrates how SE in this context emerges through layered, interdependent processes shaped by individual motivations, experiential engagement, relational organizing, and environmental constraints.

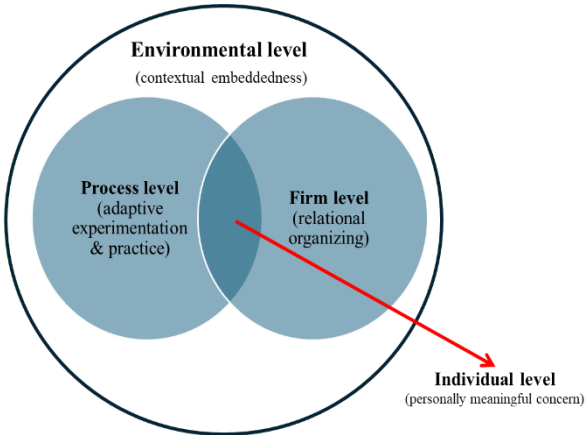


**Figure 8.**
Cross-Level Dynamics in the Emergence of SE in the Global South: Insights from a Case Study of Hydroponic Business in Urban Indonesia

## 6. Conclusion

This study examined how SE is experienced and managed by small-to-medium hydroponic entrepreneurs in Jabodetabek, Indonesia. We reveal that SE in this context does not originate from strategic intent or predefined sustainability goals, but from personally meaningful concerns, such as family health, lifestyle, boredom, or a desire for purposeful activity. These concerns, grounded in everyday life, prompted entrepreneurial engagement through situated action and personal meaning-making.

SE unfolded as an emergent and adaptive process, shaped by experimentation, relational feedback, and contextual learning. Rather than following linear models, entrepreneurs refined their practices through trial-and-error, gradually generating sustainability outcomes as natural extensions of their evolving work.

The role of context was central. Operating amid institutional voids, fragmented infrastructure, and urban informality, entrepreneurs relied on informal routines, trust-based organizing, and resourceful adaptation. Their ventures were not built through formal structures but sustained through resilience-in-practice. Taken together, these insights show that SE in Jabodetabek is a bottom-up, relational, and context-responsive process.

It evolves from lived experience and unfolds through continuous adaptation that is shaped by individual concerns, embedded practices, and environmental realities.

## 7. Acknowledgements

This study contributes to SE theory in several key ways. First, we reframe how SE may originate. Rather than emerging from sustainability-driven intentions or externally defined opportunities, SE can begin from personally meaningful concerns rooted in entrepreneurs' lived realities. This expands SE theory beyond models that presume premeditated sustainability commitments and responds to research gaps regarding SE in underexplored contexts like Indonesia's urban agriculture. Second, we complement stage-based frameworks such as Belz and Binder [2] Convergent Model by showing that SE may not unfold sequentially.

While elements of the model were present, they emerged through feedback loops, improvisation, and situated experimentation. In Jabodetabek and similar Global South contexts, structural informality and environmental unpredictability make stage-based progression less feasible.

Third, drawing on Muñoz and Cohen [17] insurgent concept, we advance SE as an evolving enactment shaped by lived concerns and adaptive engagement. It enriches the conceptual vocabulary by emphasizing mechanisms such as emergent intentionality, practice-led opportunity formation, contextual embeddedness, and relational trust. Fourth, we support calls [20] to contextualize SE theory and build knowledge from the Global South.

Institutional voids and urban informality do not merely constrain SE; they shape its form, timing, and practice. Rather than seeking generalization, this study extends the diversity of theorizing by amplifying the voices and experiences of entrepreneurs operating in underrepresented realities.

## 8. Limitations and Directions for Future Research

As a qualitative, context-specific study, this research is inherently limited in scope. It does not aim to offer generalizable truths but to provide situated insights into how SE takes shape in the Jabodetabek hydroponic sector. Its focus on small-to-medium-sized entrepreneurs also means that other actors, such as large agri-tech firms, policymakers, or rural producers, are not represented.

Future research could compare urban and rural hydroponic systems or extend the inquiry to other regions in Indonesia and the Global South. Longitudinal designs may capture how SE evolves beyond early stages. Further exploration of social identity, family roles, and digital networks could enrich understanding of opportunity formation. While this study assumed economic viability based on pilot data and as informed by the case selection criteria, future studies might more deeply examine how economic sustainability interacts with social and environmental dimensions. The conceptual propositions here could also be tested across sectors and geographies to refine SE theory in the Global South.

## References


[1] S. Schaltegger and M. Wagner, "Sustainable entrepreneurship and sustainability innovation: Categories and interactions," *Business Strategy and the Environment*, vol. 20, no. 4, pp. 222-237, 2011.

[2] F. M. Belz and J. K. Binder, "Sustainable entrepreneurship: A convergent process model," *Business Strategy and the Environment*, vol. 26, no. 1, pp. 1-17, 2017.

[3] R. O. De Carvalho, M. B. Machado, V. S. Scherer, G. C. Fuentes, C. A. S. da Luz, and M. L. G. S. da Luz, "Hydroponic lettuce production and minimally processed lettuce," *Agricultural Engineering International: CIGR Journal*, 2015.

[4] S. Khavul and G. D. Bruton, "Harnessing innovation for change: Sustainability and poverty in developing countries," *Journal of Management Studies*, vol. 50, no. 2, pp. 285–306, 2013.

[5] M. Rivera-Santos, D. Holt, D. Littlewood, and A. Kolk, "Social entrepreneurship in sub-Saharan Africa," *Academy of Management Perspectives*, vol. 29, no. 1, pp. 72-91, 2015.

[6] F. Contreras and U. Dornberger, "Sustainable entrepreneurship as a field of knowledge: analyzing the global south," *Sustainability*, vol. 15, no. 1, p. 31, 2022.

[7] M. H. Abbas and M. Bulut, "Navigating the landscape of sustainable entrepreneurship research: a systematic literature review," *Discover Sustainability*, vol. 5, no. 1, p. 171, 2024.

[8] N. Fajrina, D. Baker, and R. R. Brotodjojo, "Covid-19 and Its Effect on Home Gardening Behaviour in Indonesia," in *International Symposium Southeast Asia Vegetable 2021 (SEAVEG 2021)*, 2022.

[9] G. S. Sisodia, R. Alshamsi, and B. S. Sergi, "Business valuation strategy for new hydroponic farm development–a proposal towards sustainable agriculture development in United Arab Emirates," *British Food Journal*, vol. 123, no. 4, pp. 1560-1577, 2021.

[10] M. Del Pilar Casado-Belmonte, E. Terán-Yépez, G. M. Carrillo, and M. De las Mercedes Capobianco-Uriarte, *Exploring internationalization in sustainable entrepreneurship. In Building an entrepreneurial and sustainable society*. Hershey, PA: IGI Global, 2020.

[11] M. Kulak, A. Graves, and J. Chatterton, "Reducing greenhouse gas emissions with urban agriculture: A life cycle assessment perspective," *Landscape and Urban Planning*, vol. 111, pp. 68-78, 2013.

[12] H. Tarigan, "Pengembangan sumber daya manusia pertanian pada era disrupsi: upaya mendukung agribisnis inklusif," in *Forum Penelitian Agro Ekonomi*, 2020, vol. 38, no. 2, pp. 89-101.

[13] I. Nurhayati and R. T. K. Rinda, "Business prospects for hydroponic vegetables in the midst of the covid-19 pandemic: a case study on "Indah berbagi foundation"," *Jurnal Manajemen (Edisi Elektronik)*, vol. 12, no. 1, pp. 126-143, 2021.

[14] S. S. A. Husain and M. A. M. Anas, "To study the necessity of hydroponic farming business during covid-19 and its impact on environment sustainability," presented at the National Conference, 2022.

[15] I. Moya-Clemente, G. Ribes-Giner, and J. C. Chaves-Vargas, "Sustainable entrepreneurship: An approach from bibliometric analysis," *Journal of Business Economics and Management*, vol. 22, no. 2, pp. 297-319, 2021.

[16] N. M. Bocken, S. W. Short, P. Rana, and S. Evans, "A literature and practice review to develop sustainable business model archetypes," *Journal of Cleaner Production*, vol. 65, pp. 42-56, 2014.

[17] P. Muñoz and B. Cohen, "Sustainable entrepreneurship research: Taking stock and looking ahead," *Business Strategy and the Environment,* vol. 27, no. 3, pp. 300-322, 2018.
[18] G. Segal, D. Borgia, and J. Schoenfeld, "The motivation to become an entrepreneur," *International journal of Entrepreneurial Behavior & Research,* vol. 11, no. 1, pp. 42-57, 2005.
[19] N. A. Thompson, A. M. Herrmann, and M. P. Hekkert, "How sustainable entrepreneurs engage in institutional change: Insights from biomass torrefaction in the Netherlands," *Journal of Cleaner Production,* vol. 106, pp. 608-618, 2015.
[20] S. Wahyuni, *Qualitative research method: Theory and practice*, 3rd ed. Jakarta: Penerbit Salemba, 2024.