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"Foster Rice Fields" Ecosystem Development Strategy: Designing a Productive Agricultural Land Ownership System as a Model for Empowering the Elderly Based on Three-Party Institutions

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Abstract
Background. Indonesia's growing population of productive elderly people creates opportunities to design a new economic model that empowers this group beyond mere labor, namely as owners of productive assets.
Objectives. This article examines "Foster Rice Fields", a scheme that allows the elderly to own or adopt productive rice fields that are fully managed by village workers, as a case study in designing inclusive business ecosystem development strategies. In contrast to the single- or two-party institutional approach that is prevalent in social entrepreneurship studies, this study uses the business ecosystem strategy framework to analyze Foster Rice Fields as a value proposition that requires the alignment of seven components: elderly actors, institutional actors (business entities, organizing institutions, village partners), land resources, supporting infrastructure, market and distribution of results, policy frameworks, and knowledge bases.
Methods. Using a qualitative case study approach based on secondary data, this study maps the ecosystem's components and outlines four strategic stages of its development—initiation, expansion, authority, and renewal—adapted from the framework of business ecosystem evolution. This study also proposes a compensation mechanism based on management fees (rather than profit sharing from land value) as a technical solution to maintain the ecosystem's financial sustainability without overburdening the elderly.
Results. The results show that the success of this kind of ecosystem depends on the clarity of each actor's role, the transparency of the cost structure, and the readiness of supporting infrastructure from the initiation stage.
Conclusion. The main contribution of this article is to offer an ecosystem development strategy framework that can be adopted by socio-business system designers in Indonesia to design similar productive asset ownership schemes for vulnerable groups, complemented by methodological recommendations to measure their social impact on follow-up research.

Keywords: business ecosystem strategy, elderly economic empowerment, three-party institutions, community-supported agriculture, productive asset ownership

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INTRODUCTION

Indonesia is entering a demographic transition phase marked by an increasing proportion of the elderly population. According to data from the Central Statistics Agency, Indonesia's elderly population will reach 33.43 million in 2024 and is projected to increase significantly to nearly 65 million by 2045. Despite the common perception that an aging population is a demographic burden, data show that Indonesia's elderly are increasingly active in the workforce, with 55.32 percent of the elderly still working in 2024 (Ministry of Agriculture, 2025).

Research by Khasanah et al. (2025) indicates that farmers in Indramayu not only endure but also adapt to dual challenges, demonstrating nuanced thinking and multidimensional adaptation. Profit-loss evaluations, limited access to production assets, local social networks, and prior farming experience contextually shape farmers' decision-making. Farmers' adaptation also reveals ecological and institutional factors anchored in local knowledge and communal innovation. Setiawan et al. (2025) investigated sustainable waste management technologies in Palembang City, encompassing waste origins from residences, offices, enterprises, markets, public amenities, and regions; waste management policies are delineated in Government Regulations (Law, Presidential Regulation, Ministerial Regulation, and Regional Regulation); the existing waste management technology remains unintegrated and functions through open dumping; hindrances include institutional factors, financing, regulations, community involvement, technical operations, and the implementation of zero waste management; furthermore, comprehensive recommendations for sustainable and eco-friendly waste management technologies are strongly advocated. Wardani et al. (2023) discovered that chicory rates among the most promising species for microgreen farming. Microgreen production gained popularity in metropolitan parts of Indonesia during the pandemic, coinciding with the government's policy on Community Activity Restrictions. Using organic fertilizers in the growing medium for microgreens is vital as a nutrient source to support sustainable plant development and productivity. Sarifuddin et al. (2024) examined farming cost efficiency and the factors affecting rice-growing expenses. The study used a descriptive quantitative method, gathering data through surveys and interviews with 176 rice farmer respondents in the natural stone industrial region of Cirebon district. The analysis used frontier cost analysis with Frontier4.1 software and the Maximum Likelihood Estimation (MLE) approach. This research shows that average cost efficiency, or allocative efficiency, in the

natural stone industrial area is 0.20. Age affects the inefficiency of rice farming in natural stone industrial sites. Factors directly influencing cultivation costs are land acreage, urea, labor, rice selling price, land rental price, and labor wages.

Most models of elderly economic empowerment being developed in Indonesia—including the culinary business model that employs the elderly as service workers—position the elderly as workers or recipients of services. A question that has not been explored much is how to design a model in which the elderly play the role of owners of productive assets, rather than just labor or consumers. This shift in roles has significant engineering-industry implications: instead of designing a work system alone, designers need to design a business ecosystem that connects various actors, resources, and compensation mechanisms that are much more complex than conventional work schemes.

This article examines "Foster Rice Fields", a concrete scheme that allows the elderly to have the right to cultivate or adopt productive rice plots (±1,000 square meters), with the entire planting process to harvest managed by village workers, and the harvest can be used by the elderly themselves, donated, or converted into financial value. The scheme involves three institutional parties: a business entity that serves as a client-acquisition gateway, an organizing institution that coordinates technical operations, and a village partner that implements the field work.

In contrast to the approaches prevalent in the social entrepreneurship literature—which generally focus on single or multiple institutional structures (e.g., hybrid for-profit/nonprofit organizations)—this study argues that the Sawah Asuh scheme is better understood through the framework of a business ecosystem strategy, as it involves multilateral connections between independent but interdependent actors to realize a common value proposition (Adner, 2017). This ecosystem approach also allows a more dynamic analysis of how such schemes can grow and evolve over time, rather than merely capturing institutional conditions at a single point in time.

This article aims to: (1) map the components that make up the Foster Rice Field ecosystem and how they are interconnected; (2) formulate the strategic stages of the development of the ecosystem from initiation to long-term sustainability; and (3) design a transparent and sustainable financial compensation mechanism for all actors involved, as part of the engineering-industry solutions strategy to build an inclusive business ecosystem based on productive asset ownership for the elderly.

LITERATURE REVIEW

Business Ecosystem Strategy: Concepts and Components

Moore (1993) first introduced the concept of an business ecosystem in a Harvard Business Review article, proposing that companies should be seen not as members of a single industry but as part of an ecosystem that transcends conventional industry boundaries. Moore (1996) further argued that business ecosystems evolve through four stages: exploitation (early formation and search for partners), expansion (expansion of reach and scale), authority (establishment of position and standards), and renewal or death (continuous adaptation or failure to survive).

Adner (2017) broadens the understanding of ecosystems by proposing an "ecosystem-as-structure" approach, which defines an ecosystem as an alignment structure of partners that must interact for a focal value proposition to be realized. Unlike the view of ecosystems as mere affiliates, this structural approach emphasizes what configuration of actors is needed to create shared value, a question particularly relevant to designing new systems involving many independent parties.

Value in a business ecosystem is rarely created by a single organization; instead, it is increasingly generated through co-creation in complex networks (Adner, 2017), where each party contributes complementary services toward a greater purpose (Adner & Kapoor, 2010; Moore, 1993). Orchestrating various assets in this kind of network can increase the organization's overall value without requiring one party to build all assets and capabilities independently (Cusumano et al., 2020).

Community-Supported Agriculture as a Model Precedent

In agriculture, the model structurally closest to the Sawah Asuh scheme is community-supported agriculture (CSA), a system that connects food producers and consumers more closely, where consumers subscribe to or adopt crops from certain farmers or groups of farmers (Wikipedia/CSA, 2026). CSA is an alternative socioeconomic model in agriculture and food distribution that allows producers and consumers to share farming risks, and it has developed widely as a form of civic agriculture that aims to strengthen community through local markets.

Research on CSA shows that this model creates synergies across ecological, economic, and social sustainability, although evidence on its economic and social impacts still requires more research than its environmental impact has (CSA systematic review, 2023). What distinguishes Foster Rice Fields from conventional CSA is the main beneficiary subjects: in

classic CSAs, consumers subscribe to get fresh food and support local farmers, while in Foster Rice Fields, the elderly play the role of owners/initiators who adopt land as a form of social investment and meaningful activities, with crops as optional additional benefits (can be used alone, donated, or converted into money).

The Elderly as Economic Actors: From Labor to Asset Owners

Studies on the economic participation of the elderly in Indonesia have mainly discussed labor force participation, finding that health factors and head-of-household status significantly determine the elderly's decision to remain employed (Indonesian Economic Journal, 2022). However, the literature on the elderly as owners or controllers of productive assets—rather than as labor providers—is still very limited in the Indonesian context. This gap is important to fill, as owning productive assets can give the elderly a sense of agency and financial sustainability after retirement that differs from simply receiving wages from work.

Notanubun et al. (2026). Qualitative findings reveal persistent challenges, including limited feed availability, weak institutional support, and low adoption of improved technologies. In conclusion, strengthening technical management and promoting GFP implementation are critical for improving productivity. The study implies that policy interventions and extension services should focus on capacity building and sustainable farming practices to support smallholder farmers

METHODS

This study uses a qualitative case study approach, examining the "Sawah Asuh" scheme as a single case within the broader business ecosystem of Uma Oma Group. The case study approach was chosen because the phenomenon studied—the design of business ecosystem strategies for productive asset ownership by the elderly—is new and has not been widely documented academically in Indonesia (Yin, 2018).

The data used in this study are sourced from secondary data, including: (1) the design document of the Foster Rice Field scheme, which includes institutional structure, compensation mechanisms, and financial projections; (2) the publication of official statistics of the Central Statistics Agency on the demographics of the elderly and national agricultural productivity; (3) market data on land prices and agricultural land rents in Indonesia; (4) regulations on legal fees for land transactions (BPHTB, PPAT services); and (5) academic literature on business ecosystem strategies and community-supported agriculture.

The analysis was carried out through three stages: first, mapping ecosystem components using an ecosystem-as-structure framework (Adner, 2017), which identifies the actors, resources, and connectivity mechanisms needed for the value proposition of Foster Rice Fields to be realized; second, the formulation of strategic stages of ecosystem development by adapting the four-stage business ecosystem evolution framework (Moore, 1996); and third, cost-benefit analysis to design a transparent financial compensation mechanism for the three institutional parties involved. This research is descriptive-analytical and prescriptive (strategy design), with the main limitation being the absence of primary data from field trials; therefore, the validity of the proposed framework is conceptual and requires empirical verification in follow-up research.

DISCUSSION

Foster Rice Fields as an Ecosystem Value Proposition

The Foster Rice Field Scheme offers the following value proposition: the elderly can have full cultivation rights or adopt a seasonal one-productive rice field plot (±1,000 square meters), without the need to be directly involved in the farming process, as the entire planting-to-harvest cycle is managed by village workers. The harvest can then be used according to the elderly's preferences—consumed by themselves, donated to communities in need, or converted into financial value through sales by village partners.

No single party can realize this value proposition alone. Following the definition of an ecosystem as a connected structure (Adner, 2017), it is necessary to identify the partners with whom it must interact: those who have access to an elderly client base, those who have the capacity to manage agricultural operations remotely on behalf of landowners, and those who have technical skills in farming in the field. The absence of one of these parties will cause the value proposition to not be fully realized—a characteristic that underscores the ecosystem (not just transactional) nature of these schemes.

Mapping Ecosystem Components

Based on the ecosystem-as-structure framework, Figure 1 maps the seven components that make up the Foster Rice Field ecosystem and their connection to the core value proposition.



Figure 1. Mapping Sawah Asuh

The seven components fall into three functional categories. First, the actor component (elderly actors and institutional actors) consists of parties directly involved in transactions and decision-making. Institutional actors consist of three parties with different roles: business entities that serve as gateways for client acquisition and marketing, organizing agencies that coordinate technical operations from planning to reporting, and village partners who serve as daily technical implementers in the field. This three-party configuration—rather than the two parties common in the study of for-profit/nonprofit hybrid organizations—arises from the complexity of physical asset management (agricultural land), which requires specialized technical coordination rather than simpler service management.

Second, the resource and infrastructure components (land resources and supporting infrastructure) are physical prerequisites that enable operations, including rice fields, irrigation systems, agricultural production tools, and supporting infrastructure such as transportation, temporary storage warehouses, and reporting systems for the elderly on crop conditions and

yields. Third, the supporting institutional components (policy framework, knowledge base, and compensation mechanisms) ensure the ecosystem's sustainability and legitimacy, including applicable agrarian regulations, scientific data on productivity and farming costs as a basis for planning, and transparent financial compensation mechanisms for all parties.

Compensation Mechanism as a Technical Solution for Ecosystem Sustainability

One of the main challenges in designing this kind of multi-stakeholder ecosystem is to determine a fair and transparent compensation mechanism for the three institutional actors, without overburdening the elderly as the main value owners. This research proposes a technical solution in the form of a strict separation between direct costs in the form of land prices or land leases and service management fees, which are the basis for compensation for institutional parties.

The price of land or land lease—estimated at the range of IDR 100 million to IDR 300 million per plot for the full ownership scheme, or IDR 2.5 million to IDR 4 million per plot per planting season for the seasonal adoption scheme based on data on the Indonesian rural land market (Lamudi, 2026)—is fully forwarded to the landowner or village partners, without deductions for other institutions. On the other hand, the operational costs of farming (seeds, fertilizers, soil tillage, planting and maintenance manpower, irrigation, harvesting, and storage), which is estimated at IDR 1,207,500 per plot per planting season based on national rice farming cost data scaled to units per plot (BPS, 2026), become the basis for calculating management fees of 20 percent, or the equivalent of IDR 241,500 per plot per season.

The management fee is then divided among three institutional actors based on the proportion of their respective workloads: the organizing institution receives the largest portion (50 percent) because it bears the overall technical coordination; village partners receive 35 percent as compensation for the daily technical implementation in the field; and business entities receive 15 percent as compensation for the client acquisition function. Table 1 summarizes these costs and compensation.

Table 1. Cost Structure and Compensation Mechanism of Foster Rice Fields Ecosystem (per Plot ±1,000 m² per Planting Season)

Components	Estimated Value	Recipients/Compensation Basis
Land rental price (adoption scheme)	IDR 2,500,000 – IDR 4,000,000	100% is passed on to the landowner/village partner

Land purchase price (ownership scheme)	IDR 100,000,000 – IDR 300,000,000	100% owned by the elderly; outside the fee base
Farming Operational Costs	IDR 1,207,500 / season	Basis for calculation of management fees (20%)
Management fee (20% of operational)	IDR 241.500 / season	Divided into 3 institutional parties
— Organizing body	IDR 120,750 (50%)	Comprehensive technical coordination
— Village partners	IDR 84,525 (35%)	Field technical implementation
— Business entities	IDR 36,225 (15%)	Client acquisition and marketing

Table 1. Processed by the author based on rural land market data (Lamudi, 2026) and scaled national rice farming costs (BPS, 2026).

This technical solution aligns with the industry-engineering principle of separating direct costs from service fees in project analysis, preventing double charging of system end-users. From an ecosystem strategy perspective, this separation also maintains inter-sector trust: seniors gain clarity that the fees paid are purely for management services, not hidden markups on the value of the land to which they are fully entitled.

Economic Feasibility from a Crop Yield Perspective

The ecosystem's sustainability also depends on the value the elderly perceive as owners. Based on national rice productivity data (BPS, 2026), the average productivity reaches 53.18 quintals of Milled Dry Rice per hectare, equivalent to 532 kilograms of Milled Dry Rice per plot (0.1 hectares). Assuming a milling yield of 62 percent of grain to rice, the estimated yield is around 330 kilograms of rice per plot per planting season (reasonable range of 280–400 kilograms depending on land productivity). If converted to economic value with an estimated selling price of farmer-level rice of Rp12,000 per kilogram, the value of the crop reaches Rp3.4 million to Rp4.8 million per plot—commensurate with or exceed the total rental and operating costs for seasonal adoption schemes (±Rp4.2 million per season). This value equivalence is strategically important: ecosystems that offer a value proposition that is economically "break-even" or beneficial to the elderly (beyond the non-financial benefits of social connectedness and a sense of belonging) will have a stronger sustainability appeal than schemes that are purely philanthropic and rely on sustainable donations.

Strategic Stages of Ecosystem Development

Adapting the four-stage business ecosystem evolution framework (Moore, 1996), this study formulates a strategy for developing Foster Rice Fields through the four stages shown in Figure 2.

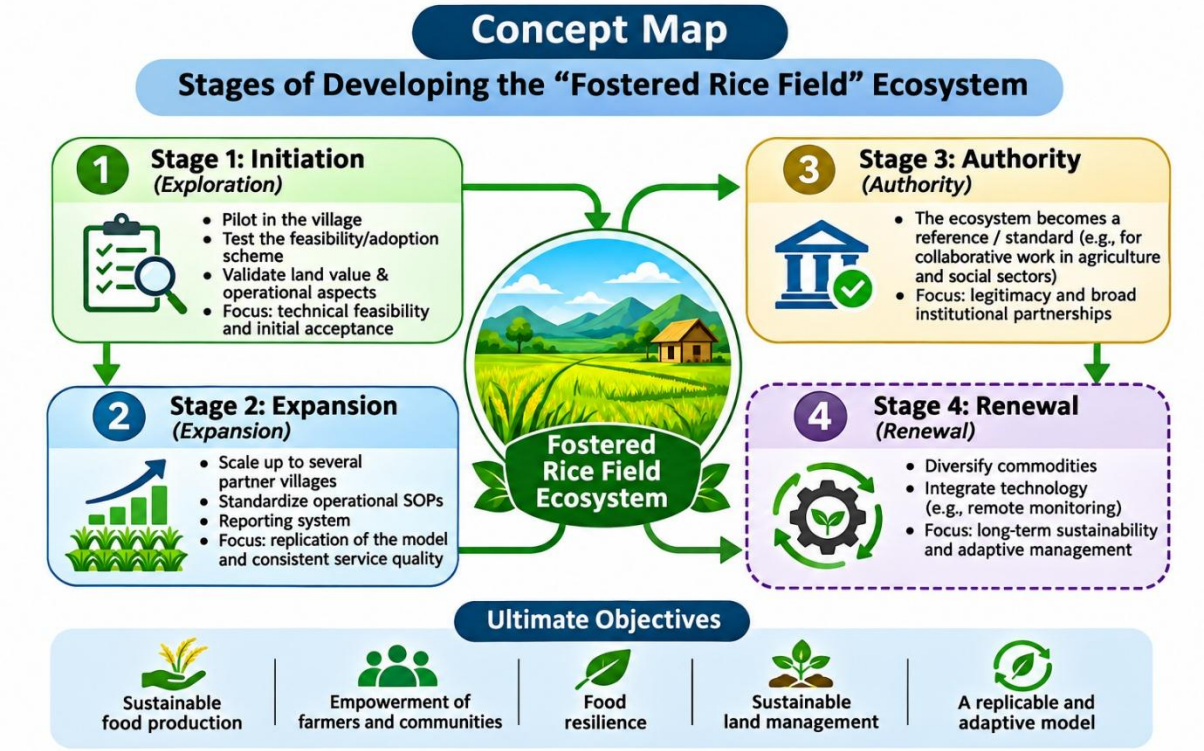


Figure 2. Concept Map of the Stages of Developing the "Fostered Rice Field" Ecosystem

In the exploitation stage, the main focus was to test the scheme's technical feasibility on a small scale—one partner village—to validate assumptions about land prices, operating costs, and initial receipts from prospective elderly participants. This stage is crucial because the cost data used in this study (Table 1) are national aggregate estimates that must be verified against real conditions in specific partner locations, given the significant variation in land prices and agricultural productivity across Indonesia.

In the expansion stage, the ecosystem is expanded to several additional partner villages, accompanied by standardization of operational procedures and reporting systems to maintain consistent service quality across multiple locations. This stage requires the organizing agency to replicate the model without sacrificing the quality of technical coordination, a common challenge when scaling a business ecosystem that relies on intensive human coordination (Adner, 2017).

At the authority stage, ecosystems that have been proven to run consistently have the potential to become a reference or standard for external parties, for example through cooperation with local government agriculture or social services, which can strengthen

legitimacy and expand access to non-commercial funding. Finally, at the renewal stage, the ecosystem's long-term sustainability requires diversification—for example, expanding into agricultural commodities beyond rice or integrating technologies such as app-based remote monitoring—to accommodate changing preferences among the elderly and environmental challenges that arise from time to time.

This staged framework confirms that ecosystem development is not a one-time event, but a dynamic process that requires a different strategy at each phase—a perspective not captured by static institutional analysis that reflects only the organizational structure at a single point in time.

Managerial Implications and Impact Measurement Recommendations

The findings of this ecosystem analysis yield several managerial implications. First, the success of a productive asset ownership scheme for the elderly depends on clearly defining each institutional actor's role from the design stage to avoid overlapping responsibilities that can lead to future conflicts. Second, transparency of the cost structure—especially the separation of land prices from management fees—is a prerequisite for trust and cannot be compromised, given that the elderly, as a vulnerable group, need assurance that their assets are not exploited by management. Third, ecosystem development strategies need to be planned in stages, with adequate field validation at the initiation stage before large-scale expansion.

As a methodological note, this study deliberately does not make quantitative social impact measurement the main focus of the analysis, given that this article emphasizes the ecosystem design strategy itself. However, for the purpose of evaluating sustainability at the advanced stages of ecosystem development, further research is suggested to consider the application of the Social Return on Investment (SROI) framework—a method of quantifying social value that has been widely applied in the evaluation of similar community-supported agriculture initiatives (Alijani & Sadeghi, 2022; SROI study in CSA, 2023)—as a complementary instrument to measure the social value generated by the Foster Rice Field ecosystem more rigorously, especially at the stage of expansion and authority when primary data from real operations are available. Implementing SROI at this stage can complement—not replace—the ecosystem strategy framework that is the main focus of this article by providing quantitative evidence of the social value generated for a wider range of stakeholders.

CONCLUSION

This research shows that productive asset ownership schemes for the elderly, as exemplified by "Foster Rice Fields", are better understood through the strategic framework of the business ecosystem than through the single or multiple institutional frameworks prevalent in conventional social entrepreneurship studies. This ecosystem requires the interconnectedness of seven components—elderly actors, three-party institutional actors, land resources, supporting infrastructure, markets and distribution of outputs, policy frameworks, and knowledge bases—all of which must align for the value proposition to be realized sustainably.

The main contribution of this research is the framework of a compensation mechanism that expressly separates direct costs (land prices) from management service fees, a technical solution that maintains financial transparency and prevents the covert exploitation of the elderly as a vulnerable group, as well as the main value owners in the ecosystem. The research also outlines four strategic stages of ecosystem development—initiation, expansion, authority, and renewal—affirming that building an inclusive business ecosystem is a gradual process that requires a different strategy at each phase, rather than a one-time event completed during initial institutional design.

This study has significant limitations because it lacks primary data from field implementation, so the estimated costs, land prices, and compensation proportions are conceptual and require empirical validation. Further research is strongly recommended to: (1) conduct a small-scale pilot project in one partner village to validate all cost assumptions and acceptance of the scheme by the elderly and village partners; (2) conduct a survey of the satisfaction and preferences of the elderly regarding the choice of ownership scheme (full versus seasonal adoption) and the choice of crop utilization; (3) fully implement the Social Return on Investment framework at the ecosystem expansion stage, including the stage of proving outcomes, adjusting deadweights and attributions, to calculating the actual SROI ratio, in order to complement the strategy framework proposed in this article with measurable evidence of social impact; and (4) comparing the Sawah Asuh ecosystem governance model with a community-supported agriculture scheme or similar productive asset ownership in other countries with a comparable demographic context, in order to enrich the benchmark base for the development of an inclusive business ecosystem based on asset ownership in Indonesia.

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