

Local Community Empowerment Strategies In Developing Green Entrepreneurship In Climate Villages

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ABSTRACT

This study aims to formulate a local community empowerment strategy to drive a community based green entrepreneurship transition within the Climate Village (Kampung Iklim) program in the buffer zone of the New Capital City of Indonesia (Ibu Kota Nusantara - IKN), East Kalimantan Province. A qualitative approach was employed, utilizing interactive data condensation and a Litmus Test via Urgency, Seriousness, and Growth (USG) analysis, involving four climate villages and eight informants comprising village government officials and climate village administrators. The findings reveal that grassroots governance dynamics vary significantly. Furthermore, the analysis identifies management digitalization and transparency as the highest priorities for maintaining collective community trust. This study offers practical contributions to grassroots circular business models aimed at supporting sustainable regional climate resilience.

INTRODUCTION

The relentless expansion of extractive industries and the monumental geopolitical transition toward the development of Indonesia's new capital, Ibu Kota Nusantara (IKN), have placed East Kalimantan at a critical ecological and socio-economic crossroads. While these macro-economic shifts herald profound regional growth, they simultaneously induce localized environmental degradation, habitat fragmentation, and socio-economic marginalization of peripheral communities (Lemhannas RI, 2024; Frans *et al.*, 2026; World Bank, 2022). In response to these vulnerabilities, the Indonesian Ministry of Environment and Forestry established the Climate Village Program (Program Kampung Iklim or Proklam) to foster grass-roots adaptation and mitigation mechanisms. However, a major structural discrepancy persists within this framework: most localized climate actions remain strictly administrative or ritualistic, driven by short-term pursuit of environmental accolades rather than self-sustaining economic incentives. This gap accentuates the urgent need to transition from passive waste management into community-based green entrepreneurship.

Sustainable Entrepreneurship Theory emphasizes that long-term ecological preservation is inherently unattainable without the simultaneous generation of economic security (Cohen and Winn, 2007; Schaltegger and Wagner, 2011). While conventional corporate social responsibility (CSR) frameworks and top-down government interventions frequently provision physical infrastructure, they structurally overlook the internal organizational capacity, behavioural mechanics, and market integration required by grass-roots actors (Belz and Binder, 2023). This neglect manifests in widespread institutional fragility, post-award participation fatigue, and a structural relapse into linear "take-make-dispose" configurations once external financing ceases (Geissdoerfer *et al.*, 2017; Kirchherr *et al.*, 2017). Therefore, understanding how to mobilize, build rigorous ecological consciousness, and systematically structure local communities into resilient, collective corporate bodies remains an unresolved intellectual dilemma at the nexus of community development and environmental management (Ellen MacArthur Foundation, 2015; Mubarak *et al.*, 2024).

Prior academic literature on Community-Based Enterprises (CBE) underscores that the viability of localized environmental ventures heavily depends on local leadership and the alignment of green outputs with market demand (Peredo and Chrisman, 2006; Peredo and McLean, 2025). Nonetheless, a substantial research gap exists regarding how micro-level social networks (such as neighbourhood units or women's collectives) can actively deploy digital infrastructure and deep-tech hilirization to bridge the gap between rural ecological practices and formalized circular carbon markets (Anand *et al.*, 2024). Most existing models are built upon static rural contexts, leaving them largely unequipped for the highly dynamic, multi-sectoral landscapes of urbanizing buffer zones surrounding megaprojects like IKN (Frans *et al.*, 2026; Zhang *et al.*, 2023).

To address this theoretical and empirical void, this study investigates the socio-technical dynamics across four distinct Proklim locations in East Kalimantan consists of Kampung Baru (Penajam Paser Utara), Muara Rapak (Balikpapan), Tani Aman (Samarinda), and Kutai Lama (Kutai Kartanegara). By examining these heterogenous settings, this article offers a dual contribution theoretically, it extends Stakeholder Capitalism and Sustainable Entrepreneurship theories by positioning community structures as active business engines rather than passive beneficiaries (Freeman and Dmytriiev, 2024). Practically, it delivers an actionable, prioritized management framework using a structured USG Litmus Test. The objective of this study is to illuminate the specific strategic pathways required to transform raw grass-roots collective action into a self-sustaining, digitized, and culturally contextualized green entrepreneurship ecosystem.

RESEARCH METHOD

This study employed a qualitative multi-site case study research design to capture the complex, multi-layered socio-economic and ecological dynamics governing grass-roots green entrepreneurship. Fieldwork was conducted within the IKN buffer zone across four intentionally sampled locations representing distinct structural environments in East

Kalimantan (Lemhannas RI, 2024; World Bank, 2022). The urban residential landscape of Muara Rapak (Balikpapan), the high urban community of Tani Aman (Samarinda), the industrial-coastal transition zone of Kampung Baru (Penajam Paser Utara), and the culturally historical, riverine extractive ecosystem of Kutai Lama (Kutai Kartanegara). Data collection spanned three months in 2026, utilizing a triangulated methodology comprising extensive field observations, semi-structured in-depth interviews with key community catalysts (local heroes, neighbourhood leaders, and corporate CSR officers), and four separate Focus Group Discussions (FGDs) involving localized women's collectives (Dasa Wisma) and waste bank administrators.

Empirical data processing followed the interactive qualitative analysis model proposed by Miles *et al.* (2014) consisting of data condensation, data display, and conclusion drawing/verification. During the data condensation phase, raw field narratives and observation transcripts were categorized into functional issue clusters: Innovation & Technology, Institutional Structures, and Barriers & Ecological Impediments. To determine the strategic prioritization of these clusters, an evaluative Litmus Test using the Urgency, Seriousness, and Growth (USG) matrix was executed. Each strategic issue was evaluated on a five-point consensus scale (5 = Very High; 1 = Very Low) across three core criteria:

1. Urgency (U): Assessing how critical it is to immediately resolve the issue to avoid imminent structural collapse or stagnation in community participation.
2. Seriousness (S): Measuring the severity of the operational impact and systemic failure if the underlying issue remains unaddressed.
3. Growth (G): Estimating the exponential potential for scalability and economic value multiplication if the strategic path is successfully prioritized.

The aggregated scores derived from the USG matrix established the hierarchical order of strategic interventions required to stabilize and scale community-based green enterprises.

RESULTS AND DISCUSSION

The cross-case empirical field observations and primary narratives gathered from the designated regional informants were synthesized into three primary strategic intervention pillars: Innovation & Technology, Institutional Structures, and Barriers & Ecological Impediments. To transition these qualitative insights into an operational roadmap suitable for the dynamic IKN buffer landscape, an evaluative Litmus Test utilizing the Urgency, Seriousness, and Growth (USG) matrix was deployed to guide targeted policy recommendations.

Table 1. Clustering of Strategic Issues in Four Buffer Areas of IKN

Main Clusters	Indicators and Community Components	Empirical Description and Location
Innovation and Technology	• Pyrolysis energy unit • “Sibastara” dashboard • Commercial downstreaming	• Small scale conversion of plastic waste into liquid fuel in Muara Rapak Climate Village (Balikpapan). • Digitization of passbooks and real time cash transparency in Tani Aman (Samarinda.) • Transformation of raw ecoenzymes into high value products (Mama enzim and Enzim Classic) in Tani Aman (Samarinda)
Institutional and Structure	• Dasa Wisma Governance • Integrated CSR Partnerships • Proklam Accreditation Status	• Implementation of positive social sanctions and collective production mandates in Samarinda • Market absorption scheme (off taker) via Company CSR partnerships in Muara Rapak (Balikpapan). • Transition of administrative status from Madya, Utama to Lestari.
Obstacles and Challenges	• Post-Award Fatigue • External Dependency • Bio-Ecological constraints	• Decrease in active customers after the competition phase ended in PPU, Balikpapan, Samarinda, and Kutai Kartanegara. • Financial vulnerability due to the loss of corporate mentoring contracts. • Human wildlife conflicts (crocodile encounters) disrupting eco-tourism initiatives in Kutai Lama (Kutai Kartanegara)

Source : Primary data processed by the researcher, 2026

The field findings reveal significant discrepancies in organizational capacity and business maturity among the studied sites. In the Muara Rapak urban sector (branded as SEMARAK), the community has successfully advanced beyond traditional philanthropy by establishing an integrated corporate partnership with Pertamina Patra Niaga. This multi stakeholder dynamic aligns with Stakeholder Capitalism, where environmental actions are co-created to satisfy both ecological balance and corporate green mandates (Freeman & Dmytriyev, 2024). Utilizing a rigorous social mapping approach, this partnership establishes a long-term off-taker contract where the state-owned enterprise systematically buys back products generated by the local *Kelompok Wanita Tani* (KWT), mitigating market access risks. By securing structural market channels, the enterprise effectively transitions from a volatile social collective into a formalized business entity capable of ensuring financial endurance (Belz & Binder, 2023; Cohen & Winn, 2007).

Muara Rapak has adopted technology driven industrial recycling by running a mechanical pyrolysis unit that processes problematic plastic waste into liquid fuel. This operationalization demonstrates a localized execution of the Circular Carbon Economy

framework, specifically transforming municipal waste streams into secondary energy resources to achieve sustainable regional dynamics (Geissdoerfer et al., 2017; Kirchherr et al., 2017). Supported by an agile governance structure, community leaders coordinate with municipal agencies (DLH and public works) via rapid digital groups, maintaining an efficient five-minute response loop to handle operational community bottlenecks. Such rapid coordination underscores the crucial role of digital transformation in reducing transaction costs and modernizing community-based public communications (Anand et al., 2024).

Looking at the high-density neighbourhood of Tani Aman in Samarinda presents a unique model of highly transparent, self-sufficient digital governance operating entirely without large corporate CSR budgets. This specific setting represents an autonomous Community-Based Enterprise (CBE) model that relies extensively on collective social capital, peer trust, and indigenous leadership rather than external capital resources to enforce sustainability (Peredo & Chrisman, 2006; Peredo & McLean, 2025). Tani Aman developed and launched the "Sibastara" website, an online ledger system that enables waste bank depositors to check their non-cash savings balances in real-time. This digital framework serves as an essential mechanism for institutional trust-building and transactional transparency, which effectively prevents the participation fatigue that commonly disrupts volunteer-driven grassroots initiatives (Anand et al., 2024; Mubarak et al., 2024). Furthermore, the inclusion of community-led digital bookkeeping platforms fosters localized financial empowerment and broadens economic access at the grassroots level (Fourqoniah et al., 2024).

The community has also achieved advanced product hilirization by fermenting organic waste into specialized eco-enzymes. This process includes the cultivation of natural *Pitera* fungi, creating high-value intermediate inputs suitable for cosmetic and health applications. This high-value technological application illustrates how grassroots eco-innovations can actively transition into higher economic margins, validating that long-term ecological preservation is inherently unattainable without the simultaneous generation of financial security (Schaltegger & Wagner, 2011). This operational system is sustained by the local Dasa Wisma framework under strong grass-roots leadership (local heroes), which applies peer motivation by requiring each household unit to produce at least one batch of eco-enzyme per month. They also link neighbourhood administrative services (such as obtaining reference letters) to active waste bank participation.

Table 2. Comparative Matrix of Characteristics and Sustainable Barriers

Research Location	Typology Characteristics	Competitive Advantages	Specific Barriers and Vulnerabilities
Balikpapan (Muara Rapak Climate Village)	Metropolitan Urban	Advanced pyrolysis technology, established corporate market absorption	Challenges in long term technology management, generational age gap among active community members
Samarinda (Tani Aman Climate Village)	Dense Settlement	Digitalization of Sibastara, highly disciplined collective structure of Dasa Wisma	Severe physical land limitations for expanding hydroponic farming and output capacity
Kutai Kartanegara (Kutai Lama Climate Village)	Coastal and Extractive Ecotourism	Strong cultural ecotourism niche, unique handicraft market integration (Seraung Sisik Naga)	High risk bio-ecological human and wildlife conflicts , Passive human resource dynamics inherited from post mining dependencies
Penajam Paser Utara (Kampung Baru Climate Village)	IKN Transition area and Mangrove area	Complete initial physical infrastructure for mangrove ecotourism	Stagnation and passive ecotourism organizational members, severe decline in active depositor base

Source: Field data condensed by the Researcher, 2026

Penajam Paser Utara (Kampung Baru) and Kutai Kartanegara (Kutai Lama) reveal notable vulnerabilities in the community based enterprise model. Despite holding an advanced Proklam status, Kampung Baru suffers from a severe decline in active depositors, dropping from over twenty down to sixteen individuals. The local economy remains strictly extractive, relying on selling unprocessed recyclables directly to wholesale scrap dealers, while previously successful initiatives like eco-enzyme processing have entirely ceased. The local mangrove ecotourism sector has experienced a severe drop in tourist arrivals, reducing the volume of waste collected and diminishing the financial incentives for local women volunteers.

Kutai Lama demonstrates strong cultural integration by incorporating the highly regulated "Sisik Naga" motif into traditional Seraung handicrafts under the explicit authority of the Kutai Sultanate. However, its broader green economic diversification has stalled. Local attempts to scale up aquacultural and river-based eco-tourism initiatives were disrupted by severe human-wildlife conflicts, specifically an increase in crocodile encounters along the

river channels. This ecological risk effectively ended local nature tourism plans and limited physical community mobility near the water.

Tabel 3. USG Analysis Priority Sequence of Management Intervention Strategies

No	Recommendation Strategy / Main Intervention	U	S	G	Total	Priority
1	Digitalization and transparency, implementation of an online collective balance tracking platform (Sibastara Model)	5	4	5	14	I
2	Product diversification and downstreaming, commercial extraction of Ecoenzyme into cosmetic and pharmaceutical commodities	4	4	4	12	II
3	Traditional market independence, reduces CSR dependency through green business incubation	4	3	4	11	III
4	Ecological disturbance mitigation, wildlife conflict management and safe tourism zoning planning	3	4	3	10	IV

Source: USG analysis results based on panel discussion, 2026

The prioritized USG Litmus Test identifies Digitalization & Transparency as the primary strategic intervention (Score 14). Field assessments confirm that the core point of failure within community enterprises is not an absence of physical infrastructure, but rather a gradual loss of trust among residents when transactional records are kept manually. By deploying open-access interfaces like Sibastara, a community can establish transparent financial records, which helps re-engage inactive depositors. Product Diversification and Hilirization emerged as the secondary priority (Score 12). Leaving community enterprises stuck in basic raw material collection yields minimal financial returns, leading to volunteer fatigue. Upgrading simple organic waste into specialized inputs like cosmetic-grade Pitera eco-enzymes generates substantially higher profit margins. This economic return provides sustainable incentives to support long term community participation.

Our data highlights a major gap in how local residents understand the carbon economy. Even though these communities are doing the heavy lifting of carbon reduction by planting mangroves and recycling heaps of trash, they have no idea what carbon credits or formal carbon tracking actually mean. This disconnect is ironic since private companies in East Kalimantan are proving every day that voluntary carbon programs can bring in great rewards and organizational value (Pitaloka & Sanistasya, 2025). The local teams, on the other hand, are still focused entirely on just cleaning up visible physical trash.

We put Digitalization and Transparency at the very top of our USG list to fix this specific issue. Getting clear data and reliable digital accounting systems running (like the *Sibastara* idea) is the essential first step. Without digital proof of what each household is doing for the environment, these grassroots groups can't provide the certified math required to join official carbon credit markets. Future help from the government or corporate partners needs to look past short-term equipment giveaways. It is time to focus heavily on teaching digital financial skills and building real marketing connections. That is the support needed to

turn these local green groups into legally recognized, independent cooperatives that can truly run their own businesses in the new IKN economy.

CONCLUSIONS AND LIMITATIONS

This study reveals that building successful green businesses in East Kalimantan's Climate Villages depends far more on strong local leaders and clear digital tracking than on official government titles. The data across our four research sites shows that while a community can easily get together to start a green project, keeping that project alive over the long haul is tough. Grassroots groups remain highly vulnerable to volunteer burnout once competitions end, unpredictable market shifts, and sudden environmental setbacks.

We found that linking existing neighborhood groups, like the *Dasa Wisma*, with open digital tracking platforms like "Sibastara" creates a highly practical roadmap. This combination rebuilds community trust and keeps neighbors actively involved. To become truly self-sufficient, these neighborhood businesses need to move away from just collecting raw garbage. Upgrading to high-value products, such as specialized eco-enzymes, allows them to secure their own financial future rather than depending on unpredictable corporate CSR grants.

A main limitation of this work is its purely qualitative focus. We analyzed how these groups function day-to-day, but we did not calculate exact carbon storage numbers or audit the specific financial ledgers of each business. The intense economic changes happening right now around the IKN buffer zone might make it hard to copy these exact results in areas that lack the same level of new infrastructure or corporate presence.

Moving forward, future studies should focus on creating simple, math-based carbon tracking tools that regular citizens can use. This will make it possible to connect small-scale neighborhood recycling data directly to international carbon markets and official green funding networks. For immediate next steps, local policymakers and corporate partners need to shift away from just donating physical equipment. Instead, investments should go toward digital business tools, official product quality certifications, and helping these local groups reform into independent, legally recognized cooperatives.

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