

# Green Entrepreneurship in Agroecological Value Chains: A Case Study of Organic Rice Production in Matèkpo, Benin

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## Abstract

In the context of escalating environmental degradation, climate uncertainty, and unsustainable agricultural practices worldwide, agroecology has increasingly emerged as a viable approach to developing sustainable and resilient food systems. This is particularly relevant in West Africa, where smallholder farmers constitute the backbone of rural economies and face the double challenge of environmental vulnerability and socio-economic marginalization. Agroecological transitions in this region are not only essential for restoring ecosystems but also represent critical socio-economic opportunities for communities. Among these opportunities, green entrepreneurship within agroecological value chains stands out as a promising pathway to align economic viability with environmental stewardship and social inclusion.

This study investigates green entrepreneurship in the specific context of organic rice production in Matèkpo, a rural community in Benin. It explores how actors along the organic rice value chain including smallholder farmers, cooperatives, local entrepreneurs, and supporting NGOs develop innovative business models that create and capture economic value while simultaneously promoting environmental conservation and enhancing local livelihoods. The research aims to contribute empirical evidence from Sub-Saharan Africa, where studies on the intersection of green entrepreneurship and agroecology remain limited.

The central research question guiding this study is: How is green entrepreneurship emerging and structured within the agroecological rice value chain in Matèkpo, Benin, and what are its economic, environmental, and social impacts? To address this question, the study sets out three main objectives: (1) to analyze the entrepreneurial strategies adopted by key value chain actors in organic rice production; (2) to assess the environmental and social benefits associated with agroecological practices; and (3) to identify institutional, financial, and policy enablers or barriers influencing the development of green entrepreneurship in this context.

The theoretical framework integrates two complementary perspectives. First, green entrepreneurship theory, which emphasizes innovative entrepreneurial activity that addresses environmental challenges while generating economic value, provides insight into the motivations and dynamics driving sustainable business creation. Second, agroecological value chain analysis extends traditional value chain approaches by incorporating ecological sustainability, equity, and resilience, highlighting the interconnectedness of economic, environmental, and social dimensions in rural production systems. This interdisciplinary lens allows a nuanced examination of how entrepreneurship can serve as a driver for sustainable rural development.

Methodologically, the research adopts a qualitative case study design focused on Matèkpo, selected for its pioneering role in organic rice production in Benin. Data collection involved 25 semi-structured interviews with farmers, cooperative leaders, local entrepreneurs, and NGO representatives, supplemented by three focus group discussions involving women and youth rice producers. In addition, field observations documented farming practices, processing activities, and local market interactions. Data were analyzed through thematic coding, aligned with the study's objectives, to elucidate patterns related to entrepreneurial strategy, environmental outcomes, social inclusion, and institutional support.

Preliminary findings reveal several critical dynamics shaping the green entrepreneurial ecosystem in Matèkpo. First, a notable emergence of green entrepreneurs is observed among smallholder farmers who are organized primarily through cooperatives. These actors adopt agroecological techniques such as composting, crop rotation, and the avoidance of chemical inputs, not merely for ecological reasons but as a deliberate strategy to access niche markets demanding organic products. Their entrepreneurial efforts reflect a dual commitment to environmental stewardship and economic sustainability.

Second, value creation within this system transcends pure financial profit. Entrepreneurs derive significant benefits in terms of community recognition, improved soil fertility, and enhanced food security, indicating that environmental ethics are deeply embedded in their business models. This aligns with theoretical perspectives that redefine entrepreneurship beyond conventional profit motives to include social and ecological value creation.

Third, despite growing urban demand for organic rice, farmers face substantial challenges that hinder the scaling of green entrepreneurship. High certification costs, limited access to affordable financing, and a lack of enabling government policies represent persistent constraints. These barriers underscore the importance of institutional support to unlock the full potential of agroecological value chains.

Fourth, social innovation emerges as a vital component of the local green economy. Initiatives supported by NGOs and cooperatives foster inclusive participation, particularly empowering women and youth through capacity-building programs, microcredit schemes, and collective marketing strategies. Such inclusive models contribute not only to equitable development but also enhance the resilience and sustainability of the value chain.

In discussing these findings, the study highlights that green entrepreneurship rooted in agroecological principles offers a viable pathway toward an inclusive green economy in rural Africa. It challenges narrow economic interpretations of entrepreneurship by foregrounding models that integrate economic resilience, ecological sustainability, and social justice. However, it also stresses that such transitions require deliberate and sustained support from enabling institutions, adapted financial mechanisms, and coherent policy frameworks. The Matèkpo case exemplifies how community-based innovation, when combined with external technical and financial assistance, can nurture vibrant entrepreneurial ecosystems capable of driving sustainable development.

The implications of this research are manifold. For scholars, it provides a comprehensive framework to analyze green entrepreneurship in agroecological systems, offering transferable insights applicable to other crops and regions. Policymakers are encouraged to create supportive environments through accessible certification processes, targeted subsidies, and improved

infrastructure. For practitioners and donors, the study underscores the necessity of investing in capacity building, facilitating market access, and fostering multi-stakeholder collaboration to strengthen agroecological value chains.

In conclusion, the case of organic rice production in Matèkpo, Benin, demonstrates the strong potential of green entrepreneurship within agroecological value chains to advance the goals of sustainable rural development and the green economy. Local actors' integration of environmental ethics with market-based strategies not only improves livelihoods but also contributes to systemic transformations toward more sustainable and inclusive food systems. This research enriches global conversations on inclusive green growth by illuminating how localized, bottom-up entrepreneurial initiatives can be pivotal in addressing complex environmental and socio-economic challenges in the Global South.

**Keywords:** value chains, sustainable development, Benin, food systems, inclusive economy.

## 1. Introduction and Research Context

The dual crises of environmental degradation and food insecurity are among the most pressing challenges facing humanity in the 21st century. Climate change, soil depletion, biodiversity loss, and pollution from chemical-intensive agriculture threaten not only ecological systems but also the livelihoods and food security of billions of people worldwide. Nowhere is this more evident than in Sub-Saharan Africa, where the majority of the population relies directly on agriculture for subsistence and income, yet faces increasing vulnerability due to climate variability, poor infrastructure, and limited access to sustainable farming technologies (FAO, 2018).

In this context, **agroecology** has emerged as a promising paradigm for rethinking food production and land management. Defined as “the application of ecological principles to agricultural systems,” agroecology integrates scientific knowledge with traditional and local practices to design diversified, resilient, and sustainable farming systems (Altieri & Nicholls, 2017; Wezel et al., 2009). Beyond its ecological dimensions, agroecology also emphasizes social equity, farmer empowerment, and the co-creation of knowledge, thus positioning itself not only as a science and practice but also as a social movement (Rosset & Altieri, 2017).

In parallel, the concept of green entrepreneurship has gained increasing attention as a driver of sustainability transitions. Green entrepreneurship refers to business activities that contribute to environmental improvement and social inclusion while generating economic value (Schaper, 2016). According to Dean and McMullen (2007), such entrepreneurship arises in response to market failures associated with environmental degradation, providing innovative solutions that internalize external costs and offer more sustainable alternatives. Green entrepreneurs thus play a dual role: they are agents of economic development and stewards of the environment.

While both agroecology and green entrepreneurship have been studied extensively in separate bodies of literature, their intersection remains underexplored, especially in the African context. The present study seeks to fill this gap by investigating how agroecological practices are operationalized within entrepreneurial activities, and how these contribute to building sustainable rural economies. More specifically, it focuses on the case of organic rice production in the village of Matèkpo, Benin, as an example

of how agroecological value chains can foster green entrepreneurship in a low-income, rural setting.

Benin, a West African country with a predominantly agricultural economy, provides a relevant and timely setting for this study. Agriculture employs over 70% of the population and contributes significantly to GDP and exports, particularly through crops such as cotton, maize, cassava, and rice (INSAE, 2021). However, the sector faces multiple sustainability challenges, including land degradation, pesticide overuse, declining soil fertility, and vulnerability to climate shocks such as floods and droughts. In response, the Government of Benin and several civil society organizations have promoted agroecological and organic farming as pathways to more sustainable and resilient food systems. The country has seen a modest but growing interest in organic agriculture, supported by international NGOs, farmer cooperatives, and niche market demand, especially in urban centers (IFOAM, 2020). Nonetheless, organic and agroecological farmers still represent a small fraction of the agricultural population, and their integration into markets remains limited and fragmented.

Simultaneously, Benin has witnessed a growing discourse around youth entrepreneurship, innovation, and green jobs, particularly as a response to rural unemployment and migration. However, much of this entrepreneurial focus remains centered on urban tech startups or microenterprises, with little attention to rural ecological ventures. There is, therefore, a significant opportunity to explore how green entrepreneurship can be rooted in rural, agroecological systems not only as a means of sustainable development but also as a way to empower local communities and transform value chains.

The village of Matèkpo, located in southern Benin, has become a notable site for experimentation with agroecological rice production. Supported by local NGOs and farmer organizations, a network of smallholder farmers has transitioned from conventional to organic rice farming, employing techniques such as composting, biological pest control, crop rotation, and water conservation. This transition has not only improved soil fertility and yields but has also opened new marketing possibilities for organic-labeled rice, particularly among health-conscious urban consumers.

Moreover, these farmers are not operating in isolation. They have formed cooperatives, engaged in local branding efforts, and participated in training programs aimed at enhancing their entrepreneurial and environmental capacities. The Matèkpo experience thus provides a rich empirical ground to investigate how agroecological practices can be embedded within entrepreneurial strategies, and what outcomes this generates for rural development, sustainability, and social inclusion.

Importantly, this study does not treat green entrepreneurship as a purely individual or profit-driven endeavor. Rather, it views entrepreneurship as a collective and contextual process, shaped by social networks, institutional arrangements, cultural values, and environmental imperatives (Anderson & Leal, 2001; Pansera & Owen, 2018). This approach allows for a more nuanced analysis of how rural actors in Benin innovate within ecological constraints and socio-economic limitations.

## 2. Research Problem and Objectives

Against this background, the main **research question** guiding this study is: How is green entrepreneurship emerging and structured within the agroecological rice value

chain in Matèkpo, Benin, and what are its economic, environmental, and social impacts?

To answer this question, the study pursues the following specific objectives:

1. To analyze the entrepreneurial strategies adopted by smallholder farmers, cooperatives, and other actors involved in the organic rice value chain;
2. To assess the environmental and social benefits associated with agroecological practices in this context;
3. To identify institutional, financial, and policy enablers or barriers that affect the emergence and sustainability of green entrepreneurship;
4. To contribute to theoretical and policy debates on green entrepreneurship and agroecological development in low-income countries.

By addressing these objectives, the research aims to make three key contributions:

- Empirically, it provides a grounded case study of agroecological entrepreneurship in rural West Africa, a region often underrepresented in global sustainability literature;
- Theoretically, it advances an integrated framework that bridges green entrepreneurship theory with agroecological value chain analysis;
- Practically, it offers insights for policymakers, development practitioners, and donors interested in promoting inclusive and environmentally sound rural development strategies.

### **3. Theoretical Framework**

This study draws upon an interdisciplinary theoretical framework that integrates insights from green entrepreneurship theory and agroecological value chain analysis. This dual lens enables a more holistic understanding of how sustainability-oriented enterprises emerge and function within ecologically embedded agricultural systems, particularly in low-income, rural contexts like Matèkpo, Benin.

#### **3.1 Green Entrepreneurship Theory**

Green entrepreneurship, sometimes referred to as ecopreneurship or sustainable entrepreneurship, is a strand of entrepreneurship theory that explicitly incorporates environmental concerns into the entrepreneurial process. Dean and McMullen (2007), in their influential work, conceptualize environmental degradation as a form of market failure that creates entrepreneurial opportunities for individuals or organizations that can internalize environmental externalities. In other words, when the market fails to account for the environmental costs of production or consumption (e.g., pollution, deforestation), it creates space for innovative actors to enter the market with alternative, more sustainable solutions.

From this perspective, green entrepreneurs do not merely pursue profit; they actively seek to solve environmental problems through the development of products, services, or processes that reduce environmental harm or restore ecological balance. Their ventures are often characterized by innovation, risk-taking, proactivity, and a long-term

vision of sustainability (Cohen & Winn, 2007; Schaltegger & Wagner, 2011). This distinguishes green entrepreneurship from traditional business models, where short-term profit maximization typically overrides environmental or social considerations. A key aspect of green entrepreneurship theory is its emphasis on opportunity recognition. Dean and McMullen (2007) argue that entrepreneurs must be able to perceive environmental degradation as both a problem and an opportunity. This cognitive framing is shaped by personal values, social networks, and institutional contexts. For example, individuals with strong pro-environmental values or exposure to environmental movements are more likely to identify green opportunities and pursue them through entrepreneurial ventures (York & Venkataraman, 2010). Moreover, Schaper (2016) emphasizes the role of institutional support including access to green finance, environmental regulations, and public incentives in enabling green entrepreneurship to flourish. Without an enabling environment, even the most motivated entrepreneurs may struggle to bring their sustainable innovations to market. However, much of the existing literature on green entrepreneurship has focused on high-income, urban settings, such as renewable energy startups, eco-fashion, or sustainable housing in Europe and North America. There remains a significant gap in understanding how green entrepreneurship manifests in rural, resource-constrained settings, particularly in the Global South. This study seeks to address that gap by analyzing how smallholder farmers and cooperatives in Matèkpo engage in environmentally conscious entrepreneurship within the organic rice value chain. Importantly, the study adopts a broad definition of entrepreneurship not limited to individual profit-driven behavior, but encompassing collective initiatives, community-based enterprises, and hybrid organizations that combine economic, social, and ecological goals (Hall et al., 2010; Pansera & Owen, 2018). This is particularly relevant in African rural contexts, where entrepreneurship is often embedded in kinship networks, traditional practices, and local resource governance systems.

### 3.2 Agroecological Value Chain Analysis

To complement the green entrepreneurship lens, the study draws on the emerging literature on agroecological value chains (AVCs), which provides a sustainability-oriented alternative to conventional value chain analysis (VCAs). Traditional VCAs, as popularized by Porter (1985) and later adapted by development practitioners (Kaplinsky & Morris, 2001), focus on the linear process of value creation from input supply and production to processing, marketing, and consumption. While useful for understanding economic efficiency and competitiveness, this approach often overlooks the ecological and social dimensions of agricultural systems.

Agroecological value chain analysis seeks to reintegrate ecological principles, equity concerns, and local knowledge into the study of value chains. According to Ros-Tonen et al. (2015), AVCs are characterized by:

**Ecological embeddedness:** value creation processes are designed to maintain or enhance ecosystem functions, such as soil health, biodiversity, and water conservation.

**Social embeddedness:** value chains are structured to include marginalized actors (e.g., women, smallholders, indigenous communities) and to distribute value more equitably.

**Governance innovations:** multi-stakeholder arrangements and hybrid institutions (e.g., farmer cooperatives, NGOs, fair trade organizations) are central to coordinating and regulating AVCs.

Tittonell et al. (2016) further argue that agroecological value chains must be understood as part of broader agri-food systems, where interactions between ecological processes, market dynamics, and policy frameworks shape sustainability outcomes. In this view, farming practices cannot be separated from post-harvest handling, consumer preferences, or certification regimes. All stages of the chain influence and are influenced by agroecological principles.

An important contribution of AVC literature is its critique of the mainstream agribusiness model, which often promotes monoculture, export-oriented, and input-intensive farming systems at the expense of environmental integrity and local food sovereignty. In contrast, agroecological value chains aim to shorten supply chains, strengthen local markets, and foster food systems that are territorially rooted, ecologically viable, and socially just (Levidow et al., 2014).

This framework is particularly useful for analyzing the case of organic rice production in Matèkpo, where smallholder farmers employ agroecological practices not only in cultivation but also in processing, branding, and distribution. Their entrepreneurial activities are shaped by ecological imperatives (e.g., maintaining soil fertility without chemical inputs), social commitments (e.g., collective marketing through cooperatives), and institutional partnerships (e.g., collaboration with NGOs and development agencies).

By applying agroecological value chain analysis, the study can assess:

How ecological principles are translated into concrete farming and post-harvest practices;

How value is created, distributed, and shared among actors in the chain;

How local governance structures and external support systems enable or constrain agroecological entrepreneurship.

### 3.3 Integrating the Two Frameworks

The integration of green entrepreneurship theory and agroecological value chain analysis offers a multi-dimensional perspective for studying sustainable agricultural innovation in rural Africa. While green entrepreneurship theory emphasizes agency, innovation, and institutional context, AVC analysis brings attention to systemic sustainability, value distribution, and ecological integration.

This combined framework allows the study to:

- ✓ Analyze **individual and collective entrepreneurial behavior** within the broader agroecological system;
- ✓ Examine the **interactions between market mechanisms and ecological processes**;
- ✓ Understand how **local knowledge, cultural norms, and social capital** contribute to the emergence of sustainable enterprises;

- ✓ Explore how **institutional environments** including policies, financing mechanisms, and development programs can support or hinder green entrepreneurship.

In doing so, the framework moves beyond narrow economic definitions of success and incorporates social and ecological metrics, such as biodiversity enhancement, food security, and community empowerment.

### 3.4 Conceptual Model

Based on the literature, the study adopts a conceptual model where green entrepreneurship in agroecological value chains is understood as a function of:

- ✓ Ecological embeddedness (agroecological practices, natural resource stewardship)
- ✓ Institutional support (policies, NGOs, financing, certification)
- ✓ Market access and value creation (branding, distribution, consumer engagement)
- ✓ Social inclusion (youth and women's participation, cooperative governance)

This model guides the empirical analysis of the Matèkpo case, helping to identify the conditions under which agroecological entrepreneurship can contribute to inclusive, resilient, and environmentally sustainable food systems.

## 4. Methodology

To investigate the dynamics of green entrepreneurship within agroecological value chains, this study adopts a qualitative case study approach, as articulated by Yin (2014). The choice of methodology is driven by the need to explore a complex, context-dependent phenomenon the emergence and structuring of green entrepreneurship in a rural, agroecological setting in Benin. Given the socio-ecological embeddedness of both entrepreneurship and agroecological systems, a case study design allows for an in-depth, holistic understanding of actors, practices, and institutional arrangements involved in the organic rice value chain of Matèkpo.

### 4.1 Research Design

The case study is an appropriate research design when the boundaries between the phenomenon and its context are blurred, and when the aim is to understand “how” and “why” questions (Yin, 2014). In this study, the case of Matèkpo is selected as a critical case not because it represents the average or typical rural farming community in Benin, but because it offers rich insights into a relatively rare but promising development: the successful integration of agroecological practices with entrepreneurial strategies.

The study focuses on the organic rice value chain in Matèkpo as the unit of analysis, encompassing various actors including farmers, cooperatives, NGOs, local entrepreneurs, and support institutions. This bounded case enables a contextualized understanding of green entrepreneurship and the structural and relational factors that shape it.

## 4.2 Research Site

Matèkpo is a rural village located in the southern region of Benin, characterized by mixed cropping systems, limited mechanization, and a strong reliance on rain-fed agriculture. Over the past decade, Matèkpo has become a hub for agroecological experimentation and innovation, largely due to the interventions of local NGOs and farmer-led initiatives promoting organic rice production. The community offers a compelling case to explore how bottom-up innovation, environmental consciousness, **and** collective entrepreneurship intersect in a rural African context.

Key features that justified the selection of Matèkpo include:

- ✓ A functional network of smallholder organic rice producers;
- ✓ Presence of farmer cooperatives engaged in branding and marketing;
- ✓ NGO involvement in training, capacity building, and certification;
- ✓ Observable transition from conventional to agroecological practices.

## 4.3 Data Collection Methods

Given the study's exploratory and interpretive nature, a multi-method qualitative strategy was employed for data collection. This approach enhances triangulation and allows for a more comprehensive understanding of the phenomenon under study.

### *a. Semi-Structured Interviews*

A total of 25 semi-structured interviews were conducted with diverse stakeholders in the organic rice value chain. These included:

- ✓ 10 organic rice farmers (5 men, 5 women), selected purposively to reflect different levels of experience, land ownership, and age;
- ✓ 4 cooperative leaders, who play key roles in coordination, certification, and marketing;
- ✓ 5 representatives of local NGOs involved in agroecological training, certification support, and advocacy;
- ✓ 3 local entrepreneurs (including a female rice processor and two marketers);
- ✓ 3 government and extension agents familiar with agricultural policy and rural development initiatives in the area.

The interviews were guided by a flexible interview protocol covering topics such as motivations for adopting agroecological practices, challenges and opportunities in organic rice production, entrepreneurial strategies, institutional support, and market dynamics. Interviews lasted between 45 and 90 minutes and were conducted in French and local languages, with the help of a trained interpreter when necessary.

### *b. Focus Group Discussions (FGDs)*

To capture collective perspectives and gendered experiences, three focus group discussions were conducted:

- ✓ One with women rice farmers (8 participants)

- ✓ One with youth rice farmers (7 participants, aged 18–30)
- ✓ One with a mixed group of cooperative members (10 participants)

FGDs provided insights into shared experiences, group strategies, and social dynamics within the community. They also allowed for the identification of commonly perceived constraints and enablers in the agroecological transition and green entrepreneurship processes.

### *c. Direct Observation*

Complementing the interviews and FGDs, direct field observations were carried out over a period of two weeks. These included:

- ✓ Visits to rice fields to observe agroecological practices (e.g., composting, pest control, water management);
- ✓ Attendance at cooperative meetings and farmer training sessions;
- ✓ Observation of processing activities (drying, milling, packaging);
- ✓ Visits to local and urban markets where organic rice was sold.

Field notes were taken to capture physical infrastructure, social interactions, tools and technologies used, and the environmental conditions of production. These observations added contextual richness and supported the validation of interview data.

## **5. Results and Findings**

This section presents the key empirical findings from the case study of organic rice production in Matèkpo. It provides an overview of how green entrepreneurship is emerging within the agroecological value chain, focusing on entrepreneurial strategies, market differentiation, social inclusion, and structural constraints. The findings are organized into thematic subsections that reflect the main patterns identified through interviews, focus group discussions, and field observations.

### **5.1 Market Differentiation Through “Organic” and “Local” Identities**

Another key finding is the strategic use of product identity and branding by farmers and cooperatives to differentiate their organic rice from conventional alternatives. The terms “bio” (organic), “local,” and “healthy” emerged as central themes in both producer narratives and market interactions.

Farmers often with support from NGOs are increasingly aware of the market value of organic certification and the rising demand among urban consumers for safe, chemical-free food. This is particularly true in cities like Cotonou and Porto-Novo, where middle-class consumers are becoming more health-conscious and environmentally aware. Organic rice from Matèkpo has been successfully positioned as a premium product, marketed at local fairs, organic markets, and via social media platforms.

A cooperative leader explained:

“We know our rice is different. It is grown without chemicals, it tastes better, and it supports local families. We tell this story to the consumers it adds value.”

Packaging, labeling, and storytelling are thus central components of their market strategy. These efforts align with the green entrepreneurship literature, particularly Schaper (2016), who emphasizes the role of environmental attributes in differentiating green products and accessing niche markets. However, the farmers of Matèkpo go beyond just product differentiation they actively construct a territorial brand that links ecological values to local identity and community benefit.

This strategy also helps to circumvent mainstream supply chains, which are often dominated by large traders and offer limited price premiums for quality or sustainability. By shortening the value chain selling directly to urban consumers or through trusted intermediaries farmers retain a greater share of the value added, reinforcing the principles of agroecological embeddedness.

Nevertheless, access to these markets remains limited and fragile. Without formal recognition, many producers cannot fully capitalize on their environmental stewardship. This leads to significant tension between market opportunity and institutional constraints, which will be discussed further below.

## **5.2 Social Innovation and Inclusion**

The third key finding relates to the emergence of socially inclusive entrepreneurial models, particularly involving women and youth. Although traditionally marginalized in land ownership and cooperative leadership, women in Matèkpo are increasingly participating in organic rice production, value addition, and marketing activities. Several women-led initiatives have emerged, often facilitated by microcredit schemes and NGO-supported training programs that target gender equity.

In one focus group, women explained how access to small loans and collective processing equipment allowed them to start a rice-processing microenterprise. They now produce “cleaned and packaged organic rice” under a collective label and sell it at urban organic markets, increasing their household incomes and visibility within the community.

“Before, we were just laborers on our husbands’ farms. Now, we are businesswomen. We work together, we save together, and people recognize our work,” shared a woman leader.

Similarly, youth engagement is gaining traction. Younger farmers, many of whom had previously considered migrating to urban centers, are now exploring organic farming as a viable livelihood. NGOs have provided smartphone-based training tools, market access strategies via WhatsApp, and leadership opportunities within cooperatives. This generational shift is encouraging, as it counters rural exodus trends and injects innovation, energy, and digital literacy into the green economy.

These findings illustrate how agroecological entrepreneurship is not only an environmental and economic endeavor, but also a social innovation process creating new roles, relationships, and opportunities for historically excluded groups. This aligns with the arguments of Chatterton & Anderson (2011), who frame green entrepreneurship as a socially embedded process that can catalyze community empowerment and transformation.

However, challenges remain in scaling and sustaining these inclusive models. Women and youth often lack access to land, collateral, and political representation. Without structural changes, their initiatives risk being marginalized or overburdened.

### 5.3 Barriers and Structural Constraints

Despite the promising developments, several systemic barriers constrain the full realization of green entrepreneurship in Matèkpo. These include:

#### *a. High Costs and Complexity of Organic Certification*

While farmers recognize the value of organic certification, most find the process expensive, bureaucratic, and poorly adapted to smallholder realities. Certification requires documentation, inspections, and sometimes payments that are out of reach for rural cooperatives. Although participatory guarantee systems (PGS) are being piloted, they are not yet recognized in all markets or by national authorities.

This echoes findings by Reynolds et al. (2007), who argue that certification schemes, although intended to empower producers, often reproduce global inequalities and entry barriers. Without more accessible and context-sensitive certification mechanisms, small-scale green entrepreneurs will remain excluded from formal high-value markets.

#### *b. Lack of Government Support and Policy Coherence*

Interviews with cooperative leaders and NGO staff revealed widespread frustration with government inaction or contradictory policies. On the one hand, ministries publicly support agroecology and organic farming; on the other, they continue to subsidize chemical fertilizers and hybrid seeds. There is little coordination between agricultural, trade, and environmental departments, and no clear policy framework or incentives for green entrepreneurship.

“We are doing the work of sustainability, but we receive no support. The government sees us as marginal,” lamented one cooperative member.

This policy vacuum hinders the ability of green entrepreneurs to scale their operations, access finance, or integrate into institutional markets like school feeding programs.

#### *c. Weak Infrastructure and Market Access*

Finally, infrastructural constraints including poor roads, limited storage facilities, and weak digital connectivity undermine the efficiency and profitability of organic value chains. These constraints increase post-harvest losses, limit transportation to urban markets, and reduce the visibility of rural producers.

While some groups have tried to overcome these barriers through collective logistics and informal digital platforms, structural investment is needed to truly unlock the potential of green entrepreneurship in rural Benin.

These preliminary findings underscore the potential and complexity of green entrepreneurship within agroecological systems. In Matèkpo, we see a community of practice that is innovating economically, ecologically, and socially despite facing significant structural challenges. The next sections of the study will delve deeper into the interactions between ecological practices, institutional arrangements, and entrepreneurial strategies, and propose policy recommendations for scaling such initiatives sustainably.

## 6. Discussion

The preliminary findings from the Matèkpo case study contribute important empirical evidence to ongoing debates about the viability, dynamics, and limitations of green entrepreneurship and agroecological value chains in rural, resource-constrained contexts. This discussion connects the empirical observations with the theoretical framework laid out earlier, particularly the works of Schaper (2016), Pansera & Owen (2018), Tittonell (2014), and FAO (2018). It also interrogates the broader implications for theory, practice, and policy related to sustainable development and inclusive green economies in sub-Saharan Africa.

The case of Matèkpo challenges mainstream notions of entrepreneurship, which often frame it as an individualistic, profit-maximizing endeavor driven by market opportunities. In contrast, the findings suggest that green entrepreneurship in Matèkpo is a socially embedded, collective, and value-driven process. It is rooted not only in the economic aspiration of rural producers but also in a shared environmental ethic and community identity.

This aligns with Schaper's (2016) assertion that green entrepreneurship is shaped by local cultural norms, knowledge systems, and institutional contexts, particularly in the Global South. The entrepreneurial behavior observed in Matèkpo emerges from a hybrid space combining traditional ecological knowledge, NGO-facilitated training, and market-facing strategies such as product differentiation and branding. Farmers are not merely reacting to consumer trends; they are actively constructing a new rural economy that redefines what it means to farm, trade, and steward the land.

Furthermore, as Pansera & Owen (2018) argue, green entrepreneurship in resource-constrained settings is less about scaling disruptive innovations and more about "frugal sustainability transitions" that is, grassroots efforts to create inclusive and resilient alternatives to extractive economic models. In Matèkpo, this is evident in how cooperatives repurpose low-cost technologies, build collective governance structures, and integrate environmental concerns into entrepreneurial practices.

The transformative potential of these practices lies not only in their environmental outcomes (e.g., reduced chemical input, improved biodiversity) but also in their social and political effects. Women and youth are gaining voice and agency; farmers are reclaiming control over production decisions; and communities are reasserting their identity through territorial branding and local food systems.

This suggests that green entrepreneurship can indeed flourish in resource-poor environments, provided there is sufficient social capital, organizational support, and alignment with local values a key insight that counters the often technocentric bias in entrepreneurship literature.

The findings also lend support to Tittonell's (2014) argument that agroecology is not just a farming technique but a strategy for rural revitalization. In Matèkpo, agroecological practices have catalyzed a broader economic and social reconfiguration of the rice value chain affecting input use, production methods, cooperative governance, processing, and marketing.

Through agroecological value chain development, farmers have moved from being disempowered suppliers in a global commodity chain to active agents in a locally-rooted, ecologically informed economy. The value chain is being restructured to reflect territorial embeddedness, ecological consciousness, and fair distribution of value three pillars emphasized by Ros-Tonen et al. (2015) in their rethinking of value chain theory for sustainability.

Moreover, agroecological value chains open up opportunities for new forms of entrepreneurship not just in farming but in seed production, composting, processing,

packaging, and retail. This diversification helps build resilience against market shocks, fosters local employment, and creates multiple entry points for marginalized groups. However, the study also highlights that agroecological value chains do not emerge organically or automatically produce equitable outcomes. Their success in Matèkpo is significantly influenced by the institutional ecosystem NGOs providing training and microcredit, cooperatives organizing collective marketing, and consumers responding to sustainability messaging. Without these intermediaries, the transition might have been slower, riskier, or even impossible.

This underscores the importance of coordinated, multi-actor engagement in building sustainable food systems. It also resonates with the FAO's (2018) view that agroecology must be supported by enabling environments, including public policies, participatory research, and inclusive governance mechanisms.

While Matèkpo's experience demonstrates the possibilities of green entrepreneurship and agroecological value chains, it also reveals their fragility in the face of structural constraints and institutional gaps.

One major barrier is the lack of formal recognition and support from state institutions. As noted in the findings, organic certification remains costly and complex, especially for smallholders. The absence of affordable and accessible certification mechanisms (such as locally validated Participatory Guarantee Systems) limits farmers' ability to access premium markets and fully benefit from their environmental practices.

Similarly, policy incoherence where governments support agroecology rhetorically while subsidizing chemical inputs undermines the credibility and viability of sustainability transitions. This reflects a broader tension in African agricultural policy, where short-term productivity goals often outweigh long-term ecological sustainability (Bezner Kerr et al., 2021).

Furthermore, weak infrastructure (roads, storage, digital platforms) and limited access to green finance make it difficult to scale successful initiatives. As Pansera & Owen (2018) note, grassroots green entrepreneurship often lacks the institutional support enjoyed by high-tech startups or export-oriented agribusinesses.

These barriers point to the need for systemic change at multiple levels:

- Policy reform that prioritizes agroecology in national agricultural strategies;
- Financial innovation to de-risk and support rural green entrepreneurs;
- Investment in local infrastructure and digital tools;
- Legal frameworks to protect community branding and biocultural resources.

A broader implication of this study is that it challenges dominant models of entrepreneurship by emphasizing its social, ecological, and relational dimensions. In contexts like Matèkpo, entrepreneurship is not driven solely by opportunity recognition and profit motives, but by collective memory, place-based knowledge, ecological stewardship, and social solidarity.

This aligns with emerging post-growth and degrowth perspectives (e.g., Escobar, 2018; Kallis et al., 2020), which argue for alternative development pathways that prioritize well-being over growth, and care over competition. Agroecological entrepreneurship as practiced in Matèkpo exemplifies a form of "livelihood-centered innovation", where the goals are not simply market success but territorial resilience, community autonomy, and ecological balance.

This shift requires rethinking not only policy and funding mechanisms but also the metrics by which success is judged. Rather than focusing solely on income generation or scalability, we must ask:

- Does the initiative regenerate ecosystems?

- Does it redistribute power and value?
- Does it enhance local agency and cultural integrity?

The case of Matèkpo suggests that affirmative answers to these questions are possible when entrepreneurship is grounded in agroecological principles and local institutional support.

The insights from Matèkpo carry important implications for scholars, development practitioners, and policymakers.

For researchers, this case demonstrates the value of integrating ecological and social dimensions into entrepreneurship studies. It calls for more interdisciplinary work that bridges agronomy, economics, political ecology, and development studies. Longitudinal and comparative studies could further illuminate how agroecological enterprises evolve over time and across different institutional landscapes.

For practitioners, the Matèkpo case offers lessons on the importance of building local capacity, strengthening social capital, and working through trusted community intermediaries. NGOs and cooperatives play a critical role in brokering knowledge, facilitating finance, and linking producers to value-conscious consumers.

For policymakers, the findings reinforce the need to invest in enabling environments not just through subsidies or technologies, but through governance reforms, public procurement programs, support for community certification, and recognition of informal actors in rural economies.

## 7. Implications

The findings from Matèkpo highlight important implications for policy, research, and practice, while avoiding repetition of earlier discussion points.

### 7.1 Policy Implications

Green entrepreneurship in agroecological systems requires a supportive institutional environment. Governments should:

- Recognize agroecology and green entrepreneurship as strategic priorities;
- Promote accessible certification systems such as Participatory Guarantee Systems (PGS);
- Invest in rural infrastructure (roads, storage, digital tools);
- Develop tailored financial instruments for green entrepreneurs;
- Ensure inclusive policies that support women and youth.

Greater coherence between agricultural, environmental, and trade policies is essential to avoid contradictions that undermine sustainability transitions.

### 7.2 Research Implications

This study highlights the need for:

- More context-specific and place-based research in African settings;
- Comparative and longitudinal studies on agroecological entrepreneurship;
- Interdisciplinary approaches combining ecological, economic, and social analysis;
- Improved metrics to assess environmental and social impacts beyond income.

Such efforts will strengthen the evidence base for sustainable rural development strategies.

### **7.3 Practical Implications**

For practitioners (NGOs, cooperatives, development actors), key lessons include:

- Prioritizing community-led and participatory approaches;
- Integrating traditional knowledge with innovation;
- Strengthening market linkages and territorial branding;
- Supporting women and youth through targeted programs;
- Building partnerships across stakeholders to address structural constraints.

## **8. Conclusion**

The case of Matèkpo provides a compelling example of how green entrepreneurship embedded within agroecological value chains can act as a powerful driver of inclusive and sustainable rural development. In this West African community, local actors have successfully integrated environmental ethics with pragmatic market-based strategies, creating a model that simultaneously addresses ecological preservation, social inclusion, and economic viability. This convergence highlights the transformative potential of grassroots entrepreneurship as a catalyst for the transition toward a green economy, especially within the context of the Global South.

At the heart of Matèkpo's experience is the recognition that sustainability cannot be achieved solely through top-down interventions or isolated technological fixes. Instead, the entrepreneurial initiatives arising from the community demonstrate a deeply rooted commitment to environmental stewardship. Farmers and cooperatives embrace agroecological principles such as biodiversity conservation, soil health management, and reduction of chemical inputs not only as ecological imperatives but as integral components of their business models. This ecological consciousness shapes decision-making and reinforces a sense of collective responsibility toward natural resource management, which is essential for long-term resilience in the face of climate change and environmental degradation.

Simultaneously, these actors have cultivated market-oriented approaches that allow them to capture greater economic value from their production systems. By leveraging the organic and local identity of their rice, they access premium markets, particularly urban consumers who increasingly demand sustainably produced food. This strategic market positioning provides a critical economic incentive that sustains and scales agroecological practices. Moreover, the development of value chains grounded in trust, cooperation, and social innovation ensures that benefits are shared equitably among producers, including marginalized groups such as women and youth, fostering social inclusion alongside environmental goals.

However, the Matèkpo case also sheds light on the challenges that green entrepreneurs face in realizing their full potential. Barriers such as the high cost and complexity of organic certification, inadequate infrastructure, limited access to finance, and insufficient government support constrain growth and broader replication of these models. These obstacles underscore the need for enabling institutional frameworks that can reduce entry barriers, provide technical assistance, facilitate market access, and recognize the multifunctional value of agroecological production.

From a broader perspective, the experience of Matèkpo aligns with emerging scholarly and policy discourses that emphasize the importance of integrating ecological, social, and economic dimensions within sustainable development pathways. It illustrates how local innovation can complement global sustainability agendas by fostering context-specific solutions tailored to the needs and capacities of rural communities in the Global South. Such bottom-up entrepreneurship is not merely adaptive but inherently transformative, capable of reshaping economic structures and social relations to be more just and sustainable.

In conclusion, the Matèkpo case underscores the vital role of green entrepreneurship within agroecological value chains as a vehicle for achieving inclusive and sustainable rural development. It demonstrates that when environmental ethics are authentically integrated with market-based strategies, local actors can improve livelihoods, strengthen community resilience, and contribute meaningfully to the transition toward a green economy. Supporting and scaling such initiatives requires concerted efforts by policymakers, researchers, and practitioners to create supportive environments, facilitate knowledge exchange, and promote equitable participation. Ultimately, fostering these synergies offers promising pathways for addressing global challenges such as climate change, food insecurity, and rural poverty, reinforcing the critical importance of place-based, inclusive approaches in building a sustainable future.

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