Transitioning Green Coffee Supply Chain Through Regenerative Agriculture

Mondulkiri Province, The Eastern Plains Landscape of Cambodia

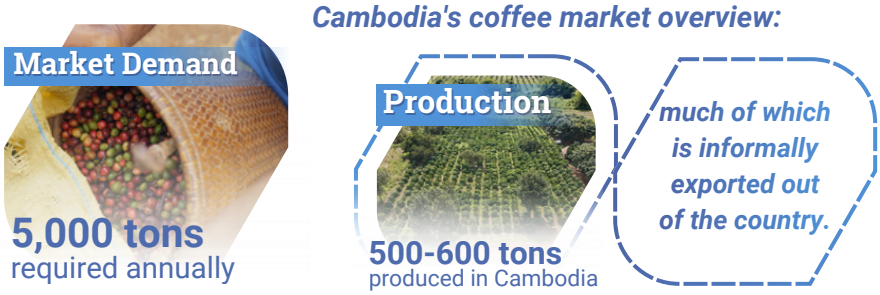


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Cambodia has established 73 natural protected areas nationwide, with five major wildlife sanctuaries and a significant biodiversity conservation corridor located within Mondulkiri province. This region serves as the ancestral homeland for the Indigenous Bunong community, who make up nearly half of the provincial population. For generations, the Bunong people have relied on the vast forests and agriculture not only for food and income, but also for cultural identity. Protecting Mondulkiri's landscape therefore means protecting both biodiversity and indigenous livelihoods. This is a consistent challenge in many nature-rich countries of low and middle income status.This program was an opportunity to demonstrate how human-centered methodology can act as a catalyst for development/conservation partnerships moving forward.

Despite incredible ecological potential, Mondulkiri's coffee sector remains underdeveloped.

Cambodia's coffee market overview:



iDE's expertise was not only in agricultural capacity building but also in developing inclusive and resilient market systems. However, we had limited experience working in underdeveloped coffee markets and environmentally protected regions. As we continued to build relationships with stakeholders in the Mondulkiri region, a clear opportunity arose to adapt our proven model to address the unique challenges of the Eastern Plains Landscape.

This is where support from the Rudy and Alice Ramsey Foundation has been catalytic. In 2024, with Ramsey Foundation support, iDE launched a targeted initiative in this Eastern Plain Landscape to help indigenous coffee farmers transition from conventional, informal cash crop farming to robust, regenerative production systems connected to resilient, sustainable supply chains.

Key Impacts and Learnings

Key Learning for iDE Cambodia

For nearly two decades, iDE Cambodia has been a pioneer in climate-smart horticulture in the north-west. We introduced new technologies and market-based approaches that enabled farmers to adopt climate-smart and good agricultural practices. Many farmers achieved formal certification, unlocking higher market returns. Local agri-entrepreneurs flourished, strengthening the functioning of farming markets within their communities.

Building on this strong foundation, our two-year regenerative coffee project in eastern Cambodia allowed us to test and adapt our approach in a new geography, working closely with indigenous communities who are highly dependent on natural resources. Through close collaboration with the Provincial Department of Agriculture, Forestry and Fisheries (PDAFF) and other key sector actors, iDE strengthened its technical expertise in coffee production under real field conditions. This hands-on learning will now shape the development of a practical coffee production protocol, a resource that will guide iDE teams and support PDAFF, the Cambodia Indigenous Friendship Association (CIFA), and other stakeholders committed to environmentally responsible coffee production.



Key Learnings for the Industry



Human-Centered Design strengthens solutions

A value chain study using Human-Centered Design (HCD) enabled iDE to listen carefully to communities before introducing solutions. This ensured that interventions were practical, culturally appropriate, and locally relevant.



Environmental integrity requires patience

Prioritizing environmental protection, particularly in Cambodia's legally protected area and forest-dependent indigenous communities, means accepting slower progress. Regenerative coffee production was selected as a conservative and responsible approach to improve yields while minimizing pressure on forests and soil degradation.



Behavior change goes beyond practice adoption

The project successfully influenced farmers' perceptions and attitudes. Farmers began investing in inputs and adopting improved farm management practices that increase yields and incomes while protecting natural resources. We learned that environmental messaging alone is insufficient. Economic benefits are essential to accelerate adoption.

Trust is foundational



In new geographies, reputation and transparency are critical. Taking our project's participating farmers to see successful farming systems in north-western Cambodia, including farmer associations and producer clusters, allowed indigenous farmers and local authorities to see proven results firsthand, accelerating trust and collaboration. Equally important was our honesty about what we know and what we must explore together. Walking alongside communities in action proved to be one of the most effective ways to build trust.

Presence and consistency matter more than digital tools



While digital tools were initially expected to support communication and learning, frequent in-person visits proved far more effective for knowledge transfer and relationship building. Language differences presented an additional challenge; however, demonstration plots established with CIFA helped bridge this gap by conveying technical messages visually and practically in ways that resonated with indigenous communities, ultimately improving adoption.

Regenerative innovation shows promise



Converting on-farm organic waste into biochar and combining it with compost and chemical fertilizer significantly improved nutrient efficiency and reduced environmental impact. This practice demonstrates strong potential for replication within regenerative coffee systems.

Cultural sensitivity drives success



Adapting to community norms, work rhythms, and local leadership structures was challenging but essential. Respecting these dynamics laid the foundation for long-term engagement.

These learnings became clear over an innovative two year program breaking new ground in market development in rural conservation areas. Although some solutions are specifically tailored to this community and location, the core lessons are broadly generalizable and applicable across diverse communities and agricultural contexts.

HCD is very effective starting point, ensuring that approaches and interventions are contextualized and grounded in a deep understanding of local needs, behaviors, and realities (constraints and opportunities). This process of co-designing solutions with communities leads to greater and sustained impact.

See below for an outline of the program challenges, activities, and outcomes.

Where We Started

In 2024, iDE conducted a thorough HCD survey to gain a deep understanding of the culture, context, and economic barriers faced by farmers of the rural Mondulkuri region. We found four key challenges that shaped the design of our program:

Coffee, a key economic pillar for this community, is critically underdeveloped

Their current production of 500–600 tons falls far short of Cambodia's annual demand of 5,000 tons, and much is exported raw through informal, unrecorded cross-border trade, limiting farmers' competitive benefits.

Farmers operate in a constrained system

Limited technical skills in cultivation, weak producer groups, strict financing policies that limit access to capital, and dependence on credit to buy inputs keep farmers locked in debt when harvests fall short. Without proper guidance on input use, yields and quality suffer, while limited access to markets makes scaling up and capturing higher value out of reach.

Climate-related challenges threaten production and livelihoods

Most farmers lack the resources or tools to withstand shocks, while rising temperatures and shifting weather patterns further undermine profitability.

Environmental and productivity risks of conventional practices

Improper use of agrochemicals, combined with limited access to best practices and investment, often leads to soil degradation and loss of natural habitats, putting both the environment and ecological functions at risk and threatening the long-term sustainability and productivity of agricultural systems.

The Opportunity

Regenerative Agriculture

Regenerative agriculture is an approach to farming that regenerates soils, maintains biodiversity, and increases climate resilience. It can be used as a solution to help Mondulkiri farmers to overcome these challenges.



Reduced tillage and minimal soil disturbance



Diverse crop rotations



Compost and decomposed animal manure application



Animal integration

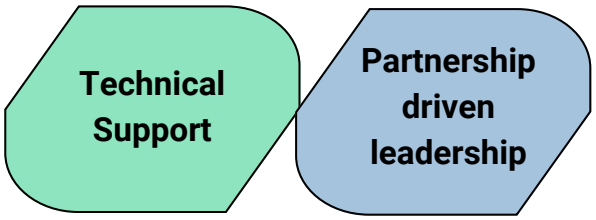


Cover cropping using nitrogen fixers, soil breakers, and biomass builders among others



Intercropping system and agroforestry

iDE's Integrated Approach For Impact:



To accelerate the transition toward a green coffee supply chain, iDE has concentrated its approach on two mutually reinforcing interventions: (1) targeted technical assistance for farmers and (2) capacity building for local leaders and institutions. Together, these approaches ensure immediate improvements at the farm level while building sustainable systems and empowered leaders that can deliver impact at scale.

1 Targeted Technical Assistance for Farmers

2024

Technical assistance has been a cornerstone of iDE's work to support coffee farmers in adopting regenerative farming practices and transitioning toward a more sustainable and resilient coffee supply chain. Through farmer training, hands-on coaching, and three-on-farm demonstration plots, iDE guided farmers on improved agronomic practices while strengthening their ability to make informed investment decisions that benefit both productivity and the environment.

These practices included:

- Pruning, a high-impact and low-cost intervention that significantly boosts productivity by removing infected plant parts (leaves, branches and fruits) to reduce pest and disease pressure, improving airflow through canopy management, and ensuring that vital nutrients are directed toward fruit development for higher, more consistent yields;
- Improved irrigation systems, including solar-powered drip irrigation, to enhance water efficiency in the face of water scarcity;
- More precise and responsible use of fertilizers and agrochemicals, minimizing soil degradation and protecting surrounding natural resources.

2025

Building on farmer enthusiasm and a conducive environment, in 2025, iDE expanded its direct support in Mondulkiri from 3 to 15 farmers. Moving beyond coffee, this partnership prioritized crop diversification and intercropping to reduce reliance on a single commodity and strengthened household economic resilience through regenerative practices.

Both intercropping and crop diversification were well-received by the community. Among the 15 participating farmers, three coffee growers integrated vegetables into their fields primarily for home consumption. Six farmers began cultivating a variety of leafy greens and fruit vegetables for commercial sale, while five other farmers integrated coffee and passion fruit with vegetables to maximize their income (one farmer had not yet started their production by the time of reporting). By integrating coffee with fast-growing crops such as passion fruit, vegetables, and/or fruit trees, farmers are able to:

- Generate immediate income while waiting for coffee harvests, enhancing financial resilience;
- Improve soil health through diversified root systems and organic matter;
- Reduce input costs, including fertilizers and water, through shared resource use.

2 Empowering Local Leaders and Institutions to Take the Lead



To ensure sustainability and scale, iDE's strategy centers on empowering local institutions rather than delivering support in isolation. Key partners, including PDAFF, CIFA, and the Community Agriculture Officer (CAO), are equipped with both technical agricultural knowledge and facilitation skills, enabling them to extend impact far beyond iDE's direct reach. While iDE provides direct support to 15 farmers, the deeper investment lies in building CIFA and PDAFF's capacity as agents of impact and scale. CIFA's technical team, trained by iDE, conducts regular knowledge-sharing sessions and field visits across its network of around 400 farmers. PDAFF, as the provincial technical authority, deepened its practical expertise through the partnership, strengthening extension support across the province. This approach ensures that knowledge, skills, and leadership remain embedded within the community, driving change that is locally owned and replicable at scale.

Building Market Readiness: From Good Agricultural Practices to Business Skills



As part of building a sustainable and market-oriented supply chain, farmers were trained in **Good Agricultural Practices (GAP)** aligned with Cambodia's national food safety standard, Cambodia Good Agricultural Practices (CamGAP). CamGAP serves not only as a safeguard for food safety, environmental protection, and farmer health, but also as a strategic entry point into premium and formal markets, enabling farmers to capture higher value and participate more competitively in domestic and regional supply chains.

Additionally, 15 participants, including farmers, traders, PDAFF and CIFA partners, engaged in their first-ever business training. The curriculum utilized value chain mapping for coffee, vegetables, and livestock to help participants visualize the product journey and identify market opportunities. A core component focused on financial literacy, specifically the practice of record-keeping for investments, expenses, and net profit. By equipping these first-time learners with the tools to develop their own business plans, this training aimed to shift their mindsets, empowering them to view their farms as enterprises, and develop viable, informed business plans.

Through these efforts, we engaged stakeholders across the market-ecosystem they operate in, ensuring an impactful support program as they spearhead an emerging sector in the region.

Overall Result 2024–2025

2024 pilot program

10%

*increase in quality input **investment** vs. 2023*

30–40%
yield production increase

Coffee farmers in the 2024 pilot program increased their yields by 30 to 40% with early adoption of improved farming practices and investing just 10% more in quality inputs.

2025 pilot program

32%

*increase in **investment** vs. 2023*

100%+
yield production increase

0.5 to **2.4**
Hectares
invested in high-quality inputs across plots

Adopted
(G)ood
(A)gricultural
(P)ractices

In 2025, three coffee farmers adopted improved agricultural practices and invested in high-quality inputs across plots ranging from 0.5 to 2.4 hectares. By increasing their investment by 32% compared to 2023 expense, they achieved a significant yield increase of over 100%.



$8,000
profit per hectare

This strategic investment in good practices and quality inputs resulted in high profitability, with farmers earning an average net profit of over US$8,000 per hectare. For farmers who had begun work in extremely tenuous, low profit supply chains, this is a transformative change.

14 of 15 farmers we worked with were awarded Cam-GAP certification by the General Directorate of Agriculture, Ministry of Agriculture, Forestry and Fisheries (MAFF), verifying that their produce meets national safety standards and that their farming practices support long-term environmental sustainability.



$400
average net profit among six vegetable farmers

Notably, despite this being their first time cultivating for commercial sale, the six vegetable farmers achieved an average net profit of nearly **US$400** over 3-4 month period on average 500m^2 of land.



$4,600
average net profile among five passion fruit farmers

Farmers practicing intercropping reported that passion fruit has become a high-value secondary income stream. On average, these farmers earned an average net profit of nearly **US$4,600** from passion fruit sales alone over a four to five months harvest period, following an approximately eight month wait before the first harvest. Mondulkiri passion fruit is highly regarded locally for its taste; however, its potential is currently constrained by a small local market availability and its highly perishable nature.



Way Forward

Building on these results, iDE is well-positioned to expand regenerative coffee production while supporting diversification into high-value vegetable and/or fruit crops to strengthen domestic supply and farmer income. In 2026, iDE plans to:

- Introduce higher-yield Robusta varieties that are already well adapted to local growing conditions, though they have lower market value. At the same time, pilot Arabica varieties, which require specific conditions such as higher altitudes and cooler climates, and typically produce lower yields but command higher prices, to assess their suitability and market potential.
- Explore linkages between regenerative home gardens and school meal programs.
- Expand entrepreneurship development, particularly for women, by training fruit and vegetable collectors and sellers in business planning and market linkage, ensuring stronger and more inclusive value chains.
- Continue strengthening CIFA's institutional capacity to drive improved market linkages.
- Continue to work closely with PDAFF and CAOs to ensure the sustainability of the extension support to the indigenous communities in Mondulkiri.

The foundation is laid and the evidence is clear. We have secured a portion of funding to continue our work, and are actively seeking partners and resources to deepen and scale our impact. If you share our vision of sustainable livelihoods for indigenous farmers, in harmony with their natural resources, we invite you to join us.

Contact us: cambodia@ideglobal.org
www.ideglobal.org/cambodia

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