

REGENERATIVE TRANSFORMATION IN AGRICULTURAL SUPPLY CHAINS



TechnoServe
and
Regenerate 30

TechnoServe's vision is a sustainable world where all people have the opportunity to prosper. At the core of our work are **inclusive, regenerative business solutions** that create living incomes, cut emissions, and protect, manage and restore ecosystems.

In 2022 TechnoServe launched its **Regenerate 30 commitment** to put farmers and small businesses at the heart of the solution to create a people-, nature- and climate-positive world. By 2030, TechnoServe's work will benefit 30 million people, cut 30 million tons of CO₂e, and strengthen the protection, management, and restoration of 30 million acres of land and water.

TechnoServe's Strategic Initiatives group works specifically with corporations on supply chain transformation to help achieve this goal. Over the last decade, we have helped corporate partners design and execute **\$250 million of inclusive investment** around the world. We believe that documenting what has worked and why will be critical to accelerate the transition toward regenerative agriculture.

THE NEED FOR REGENERATIVE TRANSFORMATION IN SUPPLY CHAINS

The global supply chains of food and beverage companies rest on a fragile and increasingly unstable foundation, due to a series of interlocking challenges:

- Many of our critical commodities are grown by small and medium farmers who are **economically struggling** and **lack resilience to**

climate change. An analysis by McKinsey found that across India, Mexico, and Ethiopia, climate change put two-thirds of smallholder farmers at heightened risk of drought, 63% at heightened risk of extreme heat, and nearly 60% at heightened risk of river flooding. Security of supply for some of the world's most critical commodities, including maize, sugar, and coffee, is at risk.

- With agriculture and food supply chains accounting for 31% of the world's carbon footprint, and Scope III emissions—especially at farm-level—contributing up to 90% of the carbon footprint of large food and beverage companies, there is a need to not only strengthen the economics and climate resilience for existing models but also to introduce **zero- or low-carbon farming models**.
- There is often a lack of **farm-level traceability**, which is increasingly a problem in light of new legislation like the European Union Deforestation Regulations. A paradigm shift to make farm-level activities more visible is required.

Solving any one of these challenges would be ambitious. Addressing all of them at once—which is what this moment requires—will force us to rethink how agricultural supply chains work.

THE SOLUTION FOR CORPORATIONS STARTS WITH THE BUSINESS CASE FOR THE FARM

If you start with a top-down view, the required solutions can seem complex and overwhelming. But if you start with the farmers—their businesses, their needs, and the solutions that would deliver them a better livelihood and greater resilience—transformative change starts to look possible.

At TechnoServe, we believe the foundation to helping corporations to make their agricultural supply chains regenerative is quantifying the **economic, carbon and nature trade-offs** for the farming enterprise, and the investments required to make this happen. This approach is based on decades of practical experience in strengthening farming business models and what it takes to successfully execute these transitions.

Centering the solution around the intersection of value creation and mitigation potential on the farm unlocks the ability for corporations to answer their most critical decisions in terms of how to prioritize investments, supply chain incentives, and purchasing relationships to realize the regenerative transformation.

EXHIBIT A.

TechnoServe's proven process for working with corporate partners to develop farmer-centered, regenerative business approaches



Step 1

Segment farmer suppliers based on economics, practices, or geography



Step 2

Baseline based on time with farms to establish their current economic reality and barriers to change



Step 3

Establish **regenerative changes** that balance farmer's, environment's, and corporate partner's needs



Step 4

Apply TechnoServe Farm Model to establish business-carbon case of different practices for farmer and corporate



Step 5

Design project strategy by segment based on business case and use to build portfolio strategy and investment case

FIVE SUCCESS FACTORS FOR REGENERATIVE TRANSFORMATION AT SCALE

Establishing the regenerative business case for the farm is the critical insight that unlocks value. However, taking that insight and using it to drive concrete change is far from straight forward. In our work with corporate partners to deliver regenerative supply chains across Africa, Latin America, and Asia, we've identified five factors that are essential to creating transformational change on the farm.

1. Focus on where the carbon case is strongest
2. Find a Regenerative champion at the top
3. Use an adaptive, phased approach to regenerative transformation
4. Understand farmer motivations and create/align incentives
5. Scale beyond your individual supply chain



CASE STUDY 1

Focus on where the carbon case is strongest

In a world of unlimited resources, time, and attention, every segment of every supply chain would benefit from investment in regenerative transformation.

But that's not the world that companies inhabit. Here, companies must prioritize the investments that are going to contribute the most to the achieving their net-zero agendas. To identify those investments, it is essential to perform rigorous, data-driven analysis; in our programs, we use the marginal abatement cost curve (MACC) to break down and visualize the return on investment.

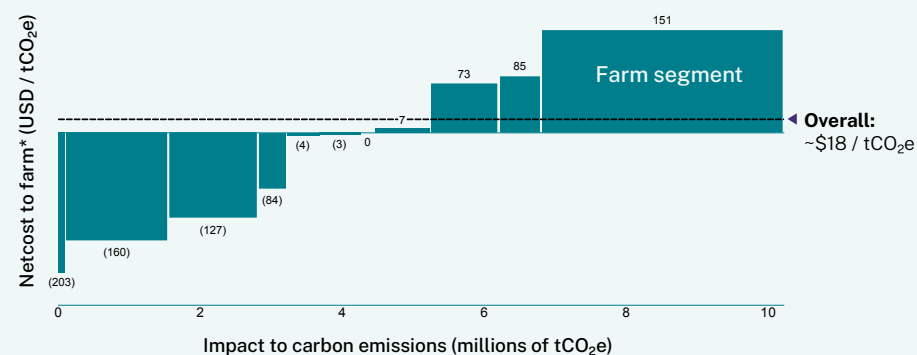
For each farm segment within a corporate's supply chain, it shows the potential for reduction in carbon emissions and the net cost to the farmer for every ton of CO₂e reduction.



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EXHIBIT B.

Marginal abatement cost curve for sourcing origins (Cumulative across company's global sourcing footprint over 20 years at steady state)



This visual is helpful because it shows decision-makers which supply chain segments are the largest in terms of carbon opportunity (the thickest bars) and which ones have a positive business case for the farmer (the order from left to right), allowing those decision-makers to prioritize and sequence investments in different areas of the supply chain.

This doesn't mean we design the program focused only on carbon reduction, but carbon abatement is frequently the lead driver that unlocks the investment.

CASE STUDY **2** Find a Regenerative champion at the top

Delivering a regenerative supply chain raises questions about the sources of value of the regenerative transformation for the company and the implication for how supplier relationships are managed and developed. Therefore, even when the carbon case is clear, an effective, sustained regenerative transition cannot be driven by just one team within a company. It must be a shared effort across internal departments — including Marketing, Sustainability, Procurement and Quality.

Our experience is that engaged leadership from the C-suite is critical for catalyzing this cooperation.

In action: Creating a movement for regenerative coffee production

In the case of Nespresso, CEO Guillaume Le Cunff has provided the leadership for the company to set ambitious net-zero and regenerative targets and has advocated for transformative change across its entire business operations, including procurement and sustainability practices. Since then, TechnoServe and Nespresso have been working together to engage suppliers, farmers, and sustainability partners to build the business case and co-design locally relevant pathways for regenerative transition across different sourcing contexts.

To catalyze collective action around these regenerative goals, TechnoServe works with Nespresso's senior leadership to facilitate both internal workshops with the company departments vital to the initiative's success and external workshops with field teams, suppliers, and technical partners in each origin. These workshops serve two purposes. First, they inspire stakeholders and contribute to reinforcing a shared vision. Second,

through pre-work and meaningful dialogue, they help these stakeholders to define specific actions and responsibilities to drive the initiative forward.

To date, we've carried out this process together in Brazil, Colombia and Costa Rica, and we plan to expand it to different Nespresso sourcing origins.



CASE STUDY **3** Use an adaptive, phased approach to regenerative transformation

We have consistently found that you are more likely to succeed if you take an adaptive, phased approach to the regenerative transformation — both at the program level and the individual farm level.

The evidence base on what works in regenerative agriculture is growing, but there are still many gaps, particularly because the answers are often context-specific. That means that there's no one-size-fits-all blueprint: programs must be constantly testing approaches, learning, and scaling what works.

Similarly, because small- and medium-sized farmers in particular are risk-adverse (due to having little safety net), it is often best to phase-in the introduction of new practices. This means encouraging farmers to take a balanced approach, adopting practices that need to be tested for their local context first, or are higher risk, across a smaller area of the farm, while adopting others that are more proven or easier across a larger area of the farm.

Consistently monitoring impacts—both environmental and economic—is critical. It provides evidence to help farmers “believe” the results and allows programs to adapt and address challenges, become more impactful over time.

In action: Phasing in regenerative agriculture for Mexico's fruit farmers

TechnoServe, Danone, Danone Ecosystem, the Walmart Foundation, Altex, and Nuup have partnered on the Madre Tierra initiative to support the regenerative transformation of Mexican strawberry farmers in the corporate supply chain. To gain credibility with farmers, TechnoServe's

farmer trainers first emphasized the agronomic practices that would lead to the biggest short-term gains in productivity, and over time once farmers had perceived economic gains, introduced the regenerative practices that would restore the health of the farms for the future.

A critical first step was to localize Danone's regenerative agriculture guidelines for easier adoption. For instance, the team promoted practices such as test pits, implementing cover crops, contour planting, and barriers for erosion control as ways to reduce carbon emissions without requiring no-till, which would have faced a lot of resistance. Through on-farm trials comparing five cover crop methods, the team pinpointed the most effective cover crops that retained moisture, minimized agrochemical use, and acted as a trap for pests.

The Madre Tierra adaptive and phased approach to regenerative agriculture yielded promising results. It led to a 36% reduction in water use, an 18% increase in soil organic matter, and a 20% decrease in chemical pesticide usage. Additionally, participating farmers saw a substantial 37% increase in net income and a 12% boost in farm-level productivity. These outcomes underscore the importance of tailored, sustainable approaches in agriculture for both environmental and economic benefits.

“I applied the compost, and only eight days afterward, my land changed. The color was different... I could not see dryness. It was marvelous.”
— **José García Martínez, strawberry farmer, Mexico**

CASE STUDY **4** Understand farmer motivations and create/align incentives

Many regenerative practices are win-win: they deliver higher incomes or lower costs to farmers while providing environmental benefits. We focus on promoting these approaches, but there are many cases where there is a trade-off in profits and sustainability in the short-term. In those situations, it is vital to have a strong understanding of the farmers' economic reality and to design effective incentives.

In action: Incentivizing behavior change for Ethiopian coffee farmers

In Ethiopia, farmers who rejuvenate their coffee trees by “stumping” them can expect to dramatically increase their production without adding to their expenses or carbon emissions. Nevertheless, adoption of the practice remains incredibly low.

Why? Because a stumped tree takes several years to return to full production, farmers face the prospect of forgoing income today for the possibility of (much) higher incomes in the future—a tradeoff that is often unattractive to farmers on the edge of poverty.

Recognizing these farm-level considerations, TechnoServe, and its partners have developed an initiative to incentivize farm rejuvenation by providing coffee growers commonly used farm tools based on the number of trees stumped. An early pilot found that this approach tripled the percentage of farmers who stumped their trees and doubled the numbers of trees stumped on each farm.

We expect these changes to be sustained over time: while the incentives help to jumpstart stumping in the short-term, farmers will take it upon

themselves to continue rejuvenating using a multiple stem rejuvenation system, without need for any incentive, as they see the positive impacts on their production and profits.



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in Gomma Wereda, Ethiopia

CASE STUDY **5** Scale beyond your individual supply chain

Food and beverage companies' supply chains do not operate in isolation from the market. In almost all instances, farming enterprises are a part of multiple chains. This presents an opportunity for synergy from companies making complementary investments. It also presents a risk in terms of offering a disincentive to change where less forward-thinking buyers remain comfortable with business as usual. And farming enterprises are inevitably part of a broader farming community – the social and nature-based challenges of their neighbors cannot always be kept separate.

Therefore, for the regenerative transformation to be completed, leading food and beverage companies need to consider how to influence and shape the broader ecosystem, working with other companies, governments, and donors to deliver a regenerative sector.

In action: Farmers benefit from complementary buyers in Mexico

TechnoServe has been working with Walmart in Mexico for over 10 years. The company's vision is to help transform the ecosystem to support smallholder livelihoods and regenerative agriculture. Leading by example, Walmart started by changing its own supply chain.

Together, we have transformed Walmart's sourcing to incorporate 28,000 smallholder farmers across 13 states growing 47 crops – from potatoes to mangoes to cilantro – representing about 10% of Walmart purchases. Smallholder farmers are receiving 80% higher incomes, and 56,000 hectares are impacted with regenerative agriculture practices.

Having proven a model for smallholder sourcing, Walmart invited complementary buyers – those who buy different qualities of the same crop – to join the program several years ago. By connecting farmers to multiple buyers, Walmart has increased the social return on the investment made to help farmers formalize and meet its quality, productivity and sustainability standards. Already, 10 companies, including Nestle, Jumex, Herdez, Frubana, Altex, Empacadora Latinoamericana, and Griffith Foods, have engaged the program to purchase produce from smallholders. In total, farmers have made more than \$100 million in sales.

This approach sounds obvious and easy, but in practice it is very hard to do. Understanding the economic model by crop is critical – for example, one must understand retail and processing end-market dynamics, specific complementarities among buyers, and the procurement approach and specifications of each company.

*"Since I started selling to Jumex and Walmart,
my earnings have been higher.
I've improved my production
and quality of life,
and I feel very grateful."*

— Marcos Torres Posadas, orange farmer, Mexico

CASE STUDY **5** Scale beyond your individual supply chain (continued)

In action: Public-sector co-investment to renovate coffee farms in Latin America

In Guatemala, Honduras, El Salvador, Nicaragua, Ecuador, and Peru, TechnoServe has helped to assemble the \$47 million MOCCA multi-stakeholder partnership to help farmers improve their incomes and climate resilience.

An anchor grant from the United States Department of Agriculture has unlocked investment from leading coffee and cocoa buyers Smuckers, JDE, Peets, Keurig Dr. Pepper, Nespresso, Kellogg's, ofi, and McDonald's. Through their financial support and commercial networks, these actors are helping to ensure that farmers have access to training on regenerative practices, high-quality seedlings from climate-resilient variants, and finance to make climate-smart investments on their farms. In 2022 alone, the initiative drove \$47 million of additional income for coffee growers. More than 38,000 farmers have adopted improved farming practices, and participating nurseries have sold more than 44 million high-quality coffee plants to help producers renovate their coffee farms.

"One of the problems we had was the management of pests and diseases that plague coffee farms. In MOCCA, we learned how to do a sampling of coffee berry borer and rust to know the degree of infestation and control them in time... that has helped us avoid losses!"

—Luz Silva, coffee farmer, Peru



CONCLUSION

The coming decades will witness a dramatic shift in how agricultural supply chains operate. This shift has the potential to simultaneously improve the resilience of millions of farming enterprises while also improving their impact on the natural world. The examples shared here show that placing improved farming business models at the center of the problem is the key to unlocking the solutions needed to put our world on a viable development pathway.

In short, change is possible and will happen. Finding the best ways to drive action-orientated collaboration between corporations, governments, donors, and implementers—to invest, act, and learn—will be what determines how quickly this transformation takes shape.





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