CASE STUDY // YIELDWISE

Shared Value Initiative

YieldWise

Building a Better Food System in Africa Through Shared Value Partnerships

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By Kyle Muther, Senior Consultant, FSG

About the Shared Value Initiative

The Shared Value Initiative is a global community of leaders who find business opportunities in societal challenges. The Initiative connects practitioners in search of the most effective ways to implement shared value. Operated by FSG, with support from a network of strategic partners, the Initiative shapes this emerging field through peer to peer exchange, market intelligence, strategy & implementation support and shared value advocacy. Learn more and join the community at www.sharedvalue.org.

About FSG

FSG is a nonprofit consulting firm specializing in strategy, evaluation, and research. Our international teams work across all sectors by partnering with corporations, foundations, school systems, nonprofits, and governments in every region of the globe. Our goal is to help companies and organizations achieve greater social change. Working with many of the world's leading corporations, nonprofit organizations, and charitable foundations, FSG has completed more than 400 consulting engagements around the world, produced dozens of research reports, published influential articles in *Harvard Business Review* and *Stanford Social Innovation Review*, and has been featured in *The New York Times*, *Wall Street Journal*, *Economist*, *Financial Times*, *Business Week*, *Fast Company*, *Forbes*, and on NPR. Learn more at www.fsg.org.

Martin Mutura, Supply Chain Manager for The Coca-Cola Company's still beverage categories in Central, Eastern, and West Africa, has a lot to be happy about right now. Underpinned by a fast-growing consumer population with rising disposable income and increasing per capita consumption, the company is experiencing significant growth in juice sales. Gross industry sales volume in Africa in 2015 reached around 62 million liters, an increase of 39% over the previous year.[1] Coca-Cola, through its Source Africa strategy, is also committed to building sustainable supply chains across the continent to support the growth of its global footprint.[2] As Mutura notes, "We aim to source 80% of our raw materials locally from Africa by end of 2020. This means we have a core business interest in building a sustainable supply chain. The more help our farmers can get to supply enough and of the right quality, the more we can purchase to reach this goal."[3]

In order to drive profitability and to meet sourcing commitments, Coca-Cola needs a higher volume of inputs at lower prices—a need made more difficult by the phenomenon of post-harvest food loss in the supply chain. Due to improper storage, handling, and transportation of produce, a staggering amount of the product does not survive the journey from farm to processor. Take mangoes, one of Coca-Cola's most important inputs: about 40% of the volume of production is lost* in the post-harvest supply chain.[4] This post-harvest loss drives up sourcing costs for Coca-Cola—so much so that it is often cheaper for Coca-Cola to purchase mangoes from India. Addressing the supply chain inefficiencies caused by food loss represents an opportunity for Coca-Cola to meet its growing demand at a lower cost. But how can the company best accomplish this objective?

*This case study uses the terms "food loss," "post-harvest loss," and "post-harvest food loss" interchangeably to mean a crop grown for human consumption that goes unconsumed. This loss usually occurs "post-harvest" in that it occurs in the value chain between harvest and consumption, often due to inadequate management and lack of market access. As a result, the problem remains invisible to buyers and consumers further down the chain. The term "food waste" describes food that goes consciously unused by consumers. While developed countries grapple primarily with food waste, the challenge in developing countries is post-harvest loss.

At the same time, Jordan Dey, Vice President of GrainPro, sees post-harvest food loss as a market opportunity. GrainPro manufactures and sells storage and drying products designed to maximize the efficiency of product handling and processing in the supply chain.[5] In order to get its products in the hands of African farmers, GrainPro must raise farmers' awareness of their products' benefits and link farmers to an established market where they can sell their goods. As Dey notes, "If you get the larger buyers to commit to buying from smallholders in these regions, that is a game-changer, because farmers know they need to produce and maintain quality, and there is a benefit to their investment in quality protection."[6]

Both Martin and Jordan view building sustainable and efficient supply chains as part of their core business. Historically, however, post-harvest food loss was a neglected factor in building efficient supply chains—often, companies do not see the lost produce as a problem as long as their core supply needs are met. Factors prompting companies to increasingly invest in an issue like post-harvest food loss include a desire to reduce sourcing costs, improve supply chain efficiency to increase profitability, or meet environmental and social objectives such as commitments to source from smallholder farmers.[7]

The challenge lies in the fact that post-harvest food loss is a complex problem that requires a deep understanding of local markets. Markets are complex, supply chains are fragmented, and infrastructure is sub-optimal. Post-harvest food loss is also difficult to measure. Yet this challenge impacts the entire rural, social, economic, and environmental system. It reduces farmer income and stalls economic growth. It causes price fluctuations, leading to greater food insecurity. It damages the environment and creates an economy that is neither inclusive nor resilient. A systems-level approach to the problem can illuminate its key drivers and effects, as well as potential solutions to the issue that will benefit smallholders, businesses, and the environment.

Rising to meet this challenge, the Rockefeller Foundation's YieldWise Initiative is designed to reduce food loss globally by at least 50%, and to improve the lives of millions of rural poor by creating strategic partnerships across the public, private, and non-profit sectors. These partnerships help farmers reduce food loss and thereby capture greater value from their crops, increase the predictability of their income, improve resilience of the land and natural resources on which they depend, and improve local economic development.[8] They also help companies identify where loss occurs during sourcing, transportation, and production, helping them to build a more transparent and traceable value chain.

The Rockefeller Foundation is well-positioned to work with the private sector to address post-harvest food loss. It understands the complexity of supply chains in emerging markets and brings significant access to networks, knowledge, and key players across sectors and geographies. Having sparked the Green Revolution in agriculture, Rockefeller is able to draw upon its leadership capabilities and

THE ROCKEFELLER FOUNDATION AND SHARED VALUE

The Rockefeller Foundation understands that it cannot bring about real, meaningful social change without the insights, engagement, and action of a range of disciplines, sectors, and actors. It uses its influence and networks to unlock private capital and enable market-based solutions that address a specific complex social challenge. Through its interconnected initiatives, it develops and scales game-changing new business models, demonstrates the economic potential of emerging solutions, and supports small and large enterprises poised for impact.

Rockefeller focuses these efforts in areas where private capital and business enterprises could and should replace grantmaking over the long-term. At its core, this is based on the premise that the resources of government and philanthropy alone are insufficient to address the world's biggest challenges. This premise also lies at the heart of shared value. Creating shared value at scale requires identifying the most promising shared value opportunities and the relevant set of partners to address barriers within complex systems, such as agricultural value chains.

> WE SEE POST-HARVEST FOOD LOSS AS A MAJOR CHALLENGE THAT NEEDS TO BE ADDRESSED BY ENSURING FARMERS SUPPLY ENOUGH AND OF THE RIGHT QUALITY.

deep experience in food and agri-business supply chains and agricultural development. Additionally, as a foundation, Rockefeller is in a position to invest low-risk and low-cost capital to motivate experimentation and learning among private, public, and non-profit partners involved in rural supply chains. The Rockefeller Foundation's first foray into a systems approach to address post-harvest food loss in Africa leverages the unique role of a wide range of partners to create both business and social value.

One such example is Rockefeller's partnership with Coca-Cola and TechnoServe in Kenya. TechnoServe improves farmer capacity and access to markets by aggregating products, improving quality, and increasing access to finance. TechnoServe is also working with Coca-Cola to identify where loss occurs in the supply chain. It is working directly through Coca-Cola's suppliers and processors to improve quality control, helping Coca-Cola meet its supply needs and driving enhanced demand down to the smallholder level. All of this enables Coca-Cola to address post-harvest food loss and take advantage of the opportunity in the African juice market. As Mutura notes, "We see post-harvest food loss as a major challenge that needs to be addressed by ensuring farmers supply enough and of the right quality. This will mean a lower cost of goods, higher volumes, and higher profitability—at the same time enabling us to reach our goal of sourcing 80% locally."[9]

Rockefeller is also working with GrainPro to prototype the distribution and marketing of grain storage products in Tanzania. The goal is to demonstrate the benefits of GrainPro's storage products to large cooperatives, national food reserve agencies, and multinational grain buyers. Rockefeller provides GrainPro with a unique opportunity to test its products in new markets. Dey says, "As a commercial company, this has been welcomed—the cost for us in engaging at this level would have been prohibitive, so [Rockefeller] allowed us to learn from that experience by being an investor in the technology."[10] The partnership between the Rockefeller Foundation and GrainPro has already resulted in new business relationships between GrainPro and key food and agri-business firms and government agencies.[11]

Past interventions directed at reducing food loss in rural supply chains have largely failed because they focused on only one point in the supply chain; they did not provide a comprehensive systemic solution linking farmer products with market demand and helping companies measure where food loss occurs so they can make appropriate investment decisions. The Rockefeller Foundation's YieldWise Initiative is designed to build on existing effective approaches—such as aggregated farmer organizations and proven post-harvest loss-reducing technologies including hermetic storage, mobile processing units, and solar cold-chain solutions—and to link them to global market demand generated by major food and beverage buyers.[12] The Foundation plays the role of systems integrator, linking large buyers to an ecosystem of technology manufacturers and suppliers, farmer cooperatives, NGOs, and financial institutions. This role allows a system conducive to shared value to form and grow.

The Problem and the Opportunity

Post-harvest food loss is a large, urgent, but addressable problem that represents a major shared value opportunity for companies across the agricultural value chain. Approximately one-third of food produced for human consumption is lost or wasted, amounting to nearly 1.3 billion tons annually.[13] The problem of food loss is getting worse. For example, according to a 2013 report from the Institution of Mechanical Engineers, rice loss in Southeast Asia increased from approximately 14% in 1994 to an average of 37% to 80% today, depending upon location.[14] By 2050, there will be 2 billion more people to feed.[15] If the amount of food loss is not reduced, agricultural yield would need to increase by an estimated 70% and require an investment of USD $83 billion per year to meet demand.[16]

Food loss has a negative impact on farmers, food consumers, and the environment. For farmers, food loss represents a wasted investment: wasted time spent tending the crop, wasted water and fertilizer used to grow the crop, and wasted resources used to transport the crop to market. In developing countries, an estimated 470 million smallholder farmers and 290 million people who rely on agriculture (brokers, processors, and buyers) lose an average of 15% of their income due to post-harvest food loss.[17]

Many of the farmers most impacted by food loss are also part of the 25% of food insecure consumers in the developing world.[18] Post-harvest food loss drives up the end price of food and restricts access to food, contributing to hunger and malnutrition.[19] Fruits and vegetables account for nearly half of all food loss worldwide.[20] The resulting lack of access to dietary diversity can lead to stunting,[21] which currently impacts 180 million children worldwide. It can also lower lifetime earnings by 22%[22]. The need for added production to make up for food loss also requires approximately 4% of world energy consumption, 20% of freshwater consumption, and uses 30% of the world's agricultural land area.[23] By 2030, the gap between expected water withdrawals and existing supply may reach 40%.[24]

Food loss is particularly acute in sub-Saharan Africa (SSA).[25] More than 30% of the food produced for human consumption in SSA is lost. The value of this food loss far exceeds the volume of food aid provided to the area each year.[26] In a region where 70% of the people derive their livelihoods from agriculture, post-harvest food loss represents foregone economic value of up to USD $4 billion per year. Strikingly, according to the UN Food and Agriculture Organization, 95% of the agricultural research investments in SSA over the last 30 years have been directed at increasing productivity,[27] with only 5% aimed at reducing food losses.[28] This potential misallocation of funds directed at increasing overall agricultural yield is largely due to a lack of awareness of the true costs of post-harvest food loss among actors across the value chain.

Addressing post-harvest food loss represents a major opportunity to improve rural livelihoods. Many promising approaches to reducing post-harvest food loss already exist, but issues related to access, affordability, and awareness inhibit their adoption at a sufficient scale. Elimination of post-harvest food loss would feed 1 billion more people by 2050—many of them across SSA, where food insecurity is the greatest.[29] This means much more than just more food for more people; it also means increased nutritional security, greater resilience within food systems, and improved farmers' livelihoods.

The Sustainable Development Goals (SDGs), which have been endorsed by all UN member states, provide a new framework for global action on issues related to post-harvest food loss, such as food security, agricultural development, and environmental conservation. Specifically, two SDGs are closely connected to post-harvest food loss:

- **Goal 2:** End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- **Goal 12:** Ensure sustainable consumption and production patterns

These goals represent a business imperative to create a sustainable market system for the future survival of the planet. The challenge is huge, but so is the opportunity to take action: should the global population reach 9.6 billion by 2050, the equivalent of almost three planets could be required to provide the natural resources needed to sustain current lifestyles.[30]

Although business investment outpaces development assistance by a measure of four to one, companies are not often part of the conversation.[31] Each of these goals represents a major business opportunity for food and agri-business firms. For example, providing food to the roughly 800 million undernourished people globally represents a market opportunity of nearly 2.5 trillion dollars.[†] Though the SDGs are ambitious, businesses can act now by building supply chains that source from African smallholders, meeting the rapidly increasing local consumer demand for fresh and processed foods while also developing a more transparent food system that continues to grow the consumer base as African economies develop in the next decades.

Increasing demand for food in SSA creates an unparalleled opportunity for the private sector to address food loss and help to meet the goal of ending malnutrition. Since 2004, global investments in the food and agri-business sector have grown threefold.[32] Two main drivers of this growth include 1) rising demand for food in emerging markets and 2) consumer preferences for traceable and certified foods globally.[33] Africa's rising demand is fueled by a rising middle class and rapid urbanization. This demand is characterized by a shift towards increased consumption of fruits and vegetables as well as processed and packaged foods. This demand is not only creating market opportunities for large multi-national companies, it is also leading to the growth of local supermarkets and wholesalers, creating additional potential markets for smallholders.

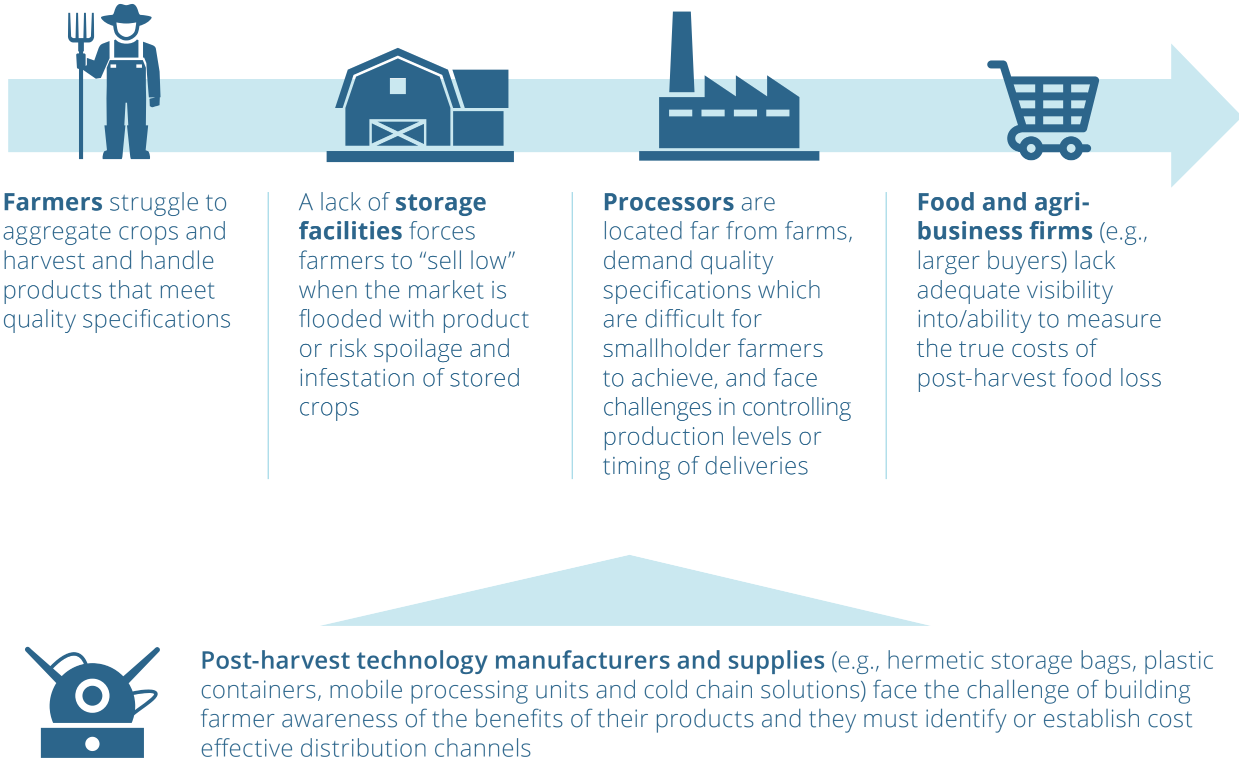
To meet this demand, many national and multi-national food and agri-business firms are shifting their strategies to solve supply chain inefficiencies by sourcing locally. This represents an unprecedented opportunity to link farmers to more reliable and sustainable demand. It also highlights the potential to create norms and best practices centered on the relationship between the African food and beverage industry and the smallholder farmer focused on the mutually beneficial goal of increasing reliable supply by reducing post-harvest food loss. There is momentum building in this new focus on local supply. In an initiative similar to Coca-Cola's commitment to source 80% of ingredients from the continent, Unilever has a goal to engage at least 500,000 smallholder farmers and 75,000 small-scale distributors in its supply network by 2020.[34] These companies are not just looking to increase sourcing from smallholders—they are also building a more transparent supply chain that meets growing consumer demand for traceability and transparency in the food system.

Creating shared value—addressing food insecurity and agricultural development challenges by building more efficient and sustainable supply chains with reduced post-harvest food loss—is essential to

†This is intended to be an approximation. Assumes food is sold at cost, low income consumers can pay up to 20% of their income for food, middle income consumers can pay up to 30%. Data on malnourishment, income data and food costs accessed from: FAO, Pew Research Global Income Data, and World Food Program School Meals Cost Data

increasing profitability in emerging markets for companies across the value chain. This can create a virtuous cycle of direct and indirect benefits to value chain participants, the agriculture industry, and the local and global economy.

FIGURE 1: ROOT CAUSES OF POST-HARVEST FOOD LOSS



While loss occurs across the value chain, at least half of all loss occurs from harvest to distribution.[35] The root causes of post-harvest food loss are multifaceted. Smallholder farmers do not efficiently aggregate products to reach the volumes that buyers seek. Large buyers face constraints in accessing a consistent, reliable, high-quality supply at the right volumes and at the specific times they need the product delivered. This creates large supply and demand fluctuations and price volatility, preventing investment in post-harvest loss-reducing technologies and practices. Technology manufacturers and suppliers of products that might reduce post-harvest food loss currently face prohibitively high costs due to a lack of awareness of the products' benefits among farmers and fragmented distribution systems. These barriers increase sourcing costs, escalate market entry risk, and reduce the private sector's willingness to invest in reaching smallholder farmers.

Rockefeller's Emerging Approach to the Post-Harvest Food Loss Challenge: Building a Shared Value Partnership System

In 2013, the Rockefeller Foundation recognized the potential to achieve positive social and economic impact across a broad range of issue areas—farmer livelihoods, food security, and the environment—by addressing the post-harvest food loss issue. The Foundation also saw the opportunity to engage a broad range of stakeholders and to meld different perspectives on this issue while at the same time accelerating the growth of the food and agri-business industry in Africa. As the Rockefeller Foundation's Caroline

Kronley summarizes, "We had an early hypothesis that the dynamism around the retail revolution in Africa would allow us to mobilize a broader range of stakeholders and interests, particularly the private sector. We thought about how we could marry this trend with solutions to the problem. We saw the shared value opportunity from the very beginning, and this shaped our strategy."[36]

During the exploratory phase, the Foundation conducted a range of activities in collaboration with a cross-sector group of stakeholders to better understand the challenge of post-harvest food loss and surface shared value opportunities. By convening multiple perspectives and aligning interests, Rockefeller created a common language and understanding of the problem and an integrated set of potential solutions. These activities included:

Social Innovation Lab: In partnership with the Global Knowledge Initiative, the Foundation held dozens of discussions among private, public, and non-profit sector leaders. These discussions pinpointed the historic lack of a systemic and private sector-driven approach to food loss as a key barrier to success in addressing the issue.

Human Centered Design: The Foundation worked with renowned design firm IDEO to better understand farmer behavior. Field research found that farmers view post-harvest food loss as inevitable. As a result, farmers view mitigating food loss to be lower-priority than increasing the quantity and quality of production. The research determined that farmers were likely to invest in food waste reduction methodologies only if they could be confident of easy access to sustainable markets in which to sell their products.

Private Sector Convening: Rockefeller partnered with the Center for Strategic and International Studies (CSIS), a high-profile think tank and research entity, to bring together multinational food and beverage companies to discuss the powerful role of market driven solutions in reducing post-harvest food loss. This convening established that food loss is not a specific focus for most companies, and that the issue should be prioritized within a strategy to build effective and sustainable supply chains rather than as an end in and of itself. It also surfaced considerable gaps in understanding how to measure food loss, and a need for a common language to discuss the issue.

Elevating the Voices of African Corporate Leaders: The Foundation worked with the Initiative for Global Development (IGD) to facilitate value chain-specific food loss discussions among African corporate leaders. These discussions highlighted food loss as a core challenge to business, and that Rockefeller could add value by convening a wide range of stakeholders and playing a systems integration role. As Helen Mant, director of IGD's advisory services, notes, "The convening enabled companies and other organizations in Nairobi to learn how each is tackling food loss. Rockefeller's core value is connecting this broader system."[37]

The discussions and exploration noted above repeatedly emphasized the importance of the supply chain as a whole, and the private sector's role within it. Even if farmers could purchase storage and processing technologies, progress would only be made if they could establish reliable and profitable demand for their products. Also, companies would not be interested in investing if they could not accurately determine where in the supply chain post-harvest food loss is occurring. This quickly led the Foundation to focus on the opportunity to engage the private sector. As Kronley notes, "We always knew the food and beverage companies would be important, but our conversation with a wide range of companies, governments, and non-profits really confirmed this."[38]

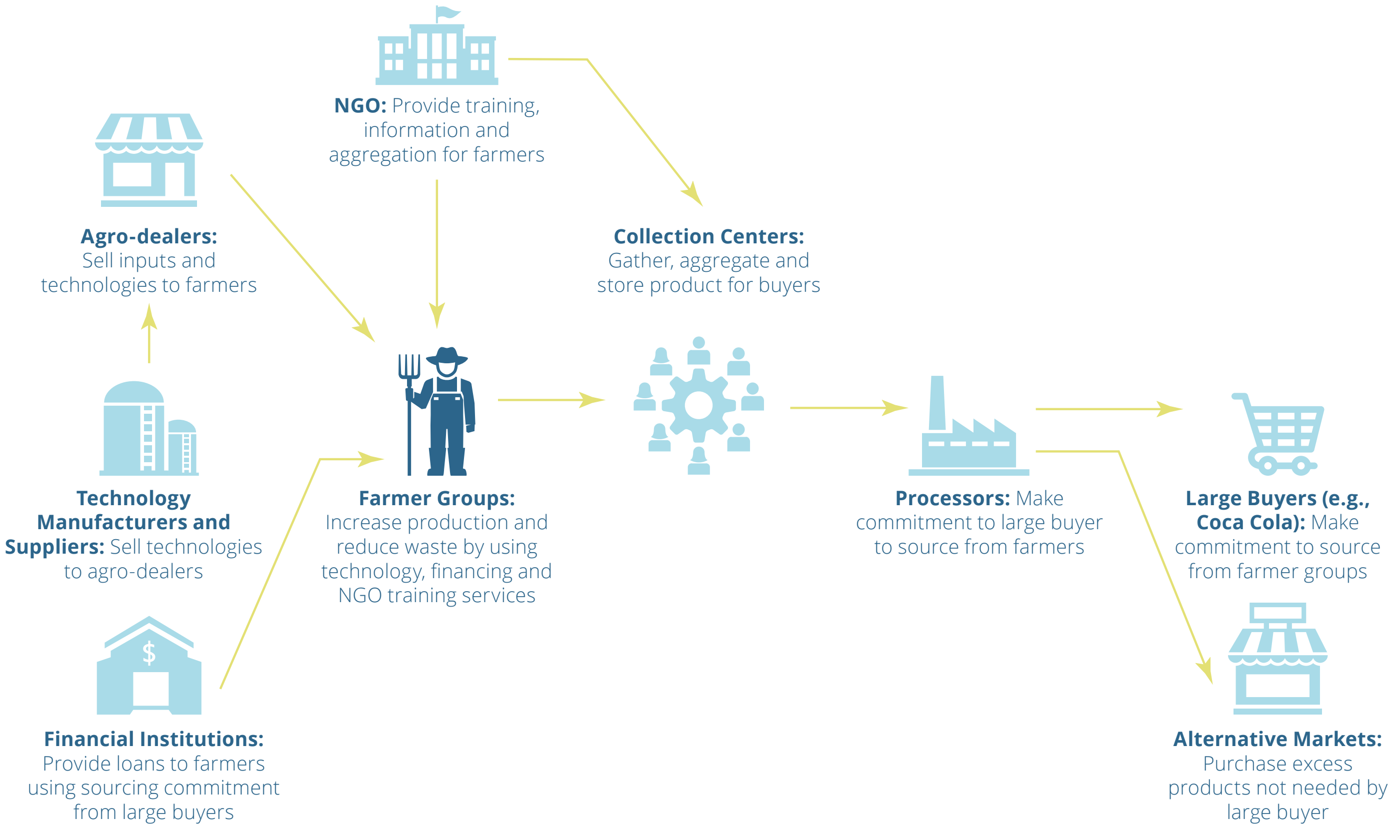
Prior interventions have not had a significant impact on post-harvest food loss because they rarely incorporate all of the components of a sustainable and efficient supply chain: market demand, product aggregation, loss reduction technology, and finance. As a result of this exploratory work, Rockefeller's emerging approach is to help build sustainable supply chains by:

- Understanding corporate sourcing requirements
- Pinpointing the costs and impact of post-harvest food loss and helping companies
- Identifying cost-effective post-harvest loss reducing technologies and practices
- Testing potential solutions in collaboration with private sector partners, and
- Convening the right system of partners (e.g., buyers, technology providers, NGOs, and farmer business organizations) to reduce risk and encourage investment in the long-term growth of the market

With the goals identified, Rockefeller's initiative, now known as YieldWise, has four key building blocks:

1. **Leverage market demand and create market relationships** among smallholder farmers, large buyers (e.g., food, beverage and grain buyers), and local alternative markets (e.g., supermarkets and wholesalers able to buy excess fresh products and dried and processed products)
2. **Aggregate farmers to facilitate training** on post-harvest management and promote adoption of post-harvest loss reducing technologies (e.g., storage, processing, distribution, etc.)
3. **Implement innovative finance mechanisms** to promote agricultural investments and facilitate adoption of loss reduction technologies, particularly among smallholder farmers
4. **Promote the adoption of loss-reducing technologies** to improve crop handling, storage, and processing

FIGURE 2: YIELDWISE HIGH-IMPACT VALUE CHAIN



Rockefeller's goal is to address the issue of post-harvest food loss in a broad range of high-impact value chains. High-impact value chains are those that feature: buyers with the ability to scale beyond one country; crops traditionally grown by smallholder farmers; crops that are increasingly in demand; and crops with a supportive enabling environment. Historically, post-harvest loss interventions have focused on staples, such as cereals and grains. While YieldWise will test solutions in cereal and grains, it will also address fruits, vegetables, root crops, and tubers because they comprise a majority of post-harvest food loss (due partly to bruising easily in transport), have a high environmental impact, are increasingly demanded by consumers, and are important for food security.

The Foundation will adapt the YieldWise model for reducing post-harvest food loss based on food and agri-business needs and the overall structure of each specific value chain. For example, large fruit and vegetable buyers are normally more interested in quality, while cereal and grain buyers are more interested in quantity. This means that, for fruit and vegetable buyers, the focus may be more on leveraging sourcing commitments to improve market linkages to farmers, shortening the value chain to improve traceability. For cereal and grain buyers, aggregation of farmer organizations to increase overall volume may be more important.

By testing the components of its strategy to reduce post-harvest food loss across different value chains, the initiative will provide critical market intelligence to a wide range of industry leaders, reducing risk for private sector engagement in building more efficient and sustainable supply chains across the continent. As IGD's Mant notes, "Even though companies are committing to source locally from Africa, working directly across the value chain and directly with farmers still takes many companies out of their comfort zone. Rockefeller plays the role of creating the system that can increase the pie for everyone."[39]

Building the YieldWise System: Delivering Value and Early Results

Through YieldWise, Rockefeller's ability to engage a range of partners that support the system to function more effectively (including NGOs with expertise in relevant geographies, farmer business organizations, technology providers, financing entities, and others) will enable large buyers already seeking local supply to take a more intentional and market-driven approach to smallholder sourcing. This will create new norms and practices to support an efficient approach to local sourcing across Africa, motivating loss reduction across the supply chain. Rockefeller will provide value by:

- Measuring and tracking loss in food and agri-business supply chains
- Engaging smallholders who can deliver high-quality product in a way that gets more to market with less food lost along the way
- Motivating large buyers to provide volume purchase commitments that can be collateralized to unlock value for actors along the value chain, and
- Partnering with technology suppliers and manufacturers to prototype and build the business model for specific post-harvest loss reducing products (e.g., storage, cold chain, processing, etc.) to become financially viable.

The YieldWise initiative aims to have catalytic impact over the next seven years. The first five years of the initiative will be dedicated to reducing food loss in approximately eight value chains by establishing the value proposition for food loss reduction with key partners in each value chain. The final two years will focus on more targeted interventions to ensure sustained impact, disseminating learning, and motivating others to adopt the approach. Where possible, different innovations will be scaled and replicated across value chains.

Phase 1—Demonstration of the Model Across Key Value Chains: The first three years of the initiative will focus on demonstrating proof points in four specific value chains where the model creates substantial social, economic, and positive environmental impact. This success will motivate other companies, NGOs, and multilateral institutions to become involved in the process. The Foundation has intentionally selected value chains where large buyers are already active, significant market growth is occurring, and a supportive enabling environment is in place. The ultimate goal is to validate the model and sow the seeds of champions across these value chains that can signal the opportunity for action.

Phase 2—Deepening the Impact and Scaling the Model to New Geographies and Value Chains: The next two years of the program will focus on deepening the impact of the first phase and scaling the model beyond the initial four value chains. The Foundation intends to deliver measurable business outcomes, influencing private sector partners to replicate the model in other geographies and in connection with other value chains to attract new technology suppliers and buyers to adopt the model. The key success factor will be whether the model is financially self-sustaining in that training and processing and other support capacities are creating real and measurable market value, and the overall cost and complexity of the model is decreasing. In addition, Rockefeller will seek to influence key organizations and networks to make post-harvest food loss a greater priority on the global stage.

Phase 3—Consolidation and Exit: In the final two years, Rockefeller will consolidate support for food loss prevention from farmers, and public, private, and non-profit sectors. The Foundation will ensure that anchor buyers and other key partners have the processes and tools in place to continue to scale and sustain activity (e.g., metrics, training approaches and tools, connections to financing mechanisms, etc.).

As of mid 2016, Rockefeller has already begun to work in the mango value chain in Kenya through an ecosystem partnership with Coca-Cola (the world's largest beverage company), TechnoServe (an international NGO focused on business solutions to poverty), Meru Greens Horticulture (a Kenyan fruit and vegetable exporter) and AGCO/GSI (a multinational storage and cold-chain technology manufacturer and supplier). This partnership is profiled on page 14. The Foundation is also actively exploring ecosystem partnerships with maize in Tanzania as well as tomatoes and cassava in Nigeria.

FIGURE 3: ROCKEFELLER'S STRATEGIC APPROACH PRESENTS A VALUE PROPOSITION FOR ORGANIZATIONS ACROSS THE MARKET SYSTEM

FARMERS	Farmers are empowered to aggregate their crops and adopt and appropriately utilize post-harvest management practices and technologies, reducing loss and increasing the reliability of income flows.
TRADERS AND BROKERS	More consistent volume and quality to meet growing demand and access to technology to improve efficiency and competitiveness (reduced time and transport which shortens the value chain).
AGGREGATION AND PROCUREMENT CENTERS	In collaboration with buyers, NGOs and others, Rockefeller creates and strengthens the capacity of these centers so they can serve as a one-stop shop for crop purchases.
PROCESSORS	Processors are able to deliver a consistent volume of product and a reliably quality product to large buyers, strengthening their relationship with these buyers. Processors will also have access to local markets for value enhanced food (juices, dried).
FOOD AND BEVERAGE BUYERS	Buyers are linked to aggregated smallholder farmer organizations, technology providers, and NGO capacity-builders to increase access to a high-quality and reliable smallholder supply. Rockefeller partners with buyers and farmer organizations/cooperatives to develop crop volume purchase agreements and contracts that stimulate and sustain market demand. Buyers will be able to access more reliable and higher-quality product to meet growing demand by enhancing accountability, transparency, and efficiency of the value chain.
LOCAL SUPERMARKETS AND WHOLESALERS	These important alternative markets are connected to farmer organizations that have excess supply of fruits and vegetables and can deliver high-quality processed/dried products.
NGOS	The initiative partners with NGOs to aggregate and train smallholder farmers to meet the quantity and quality specifications of large buyers. They also provide farmers with technical assistance to effectively use technologies and measure results and test hypotheses over time to provide farmer organizations with timely and actionable business advice that improves their capacity to reduce post-harvest food loss, thereby increasing return on investment and overall income.
AGRO-DEALERS	Rockefeller recruits and educates agro-dealers to provide new distribution channels for post-harvest food loss reducing technologies. There is a broader customer base and potential for new product development/prototyping to scale up.
FINANCIAL INSTITUTIONS	Rockefeller helps reduce risk for financial institutions to provide loans for food waste reduction technology by using food and beverage buyer sourcing commitments as collateral for financing. There is an opportunity to sell current services and prototype new instruments to serve a broader range of customers and deepen these relationships over time.

The following profiles illustrate Rockefeller's emerging approach in action.

ROCKEFELLER'S SYSTEMS APPROACH TO THE MANGO VALUE CHAIN IN KENYA

The Rockefeller Foundation is working with a range of stakeholders in the mango value chain to link farmers to buyers by aggregating fresh and processed mangoes and prototyping a solar-powered cold chain storage product to reduce post-harvest loss and improve market access. The key participants in the partnership are:

- Meru Greens Horticulture, a Kenya-based fruit and vegetable exporter
- AGCO/GSI, a global leader in the design, manufacture, and distribution of agricultural equipment
- TechnoServe, a nonprofit organization that develops business solutions to poverty by linking people to information, capital, and markets
- A local farmer business organization owned and operated jointly by a group of aggregated farmers living closely together, and who share the profits and benefits of their farming efforts

The goal of the partnership is to enable farmers to access consistent and reliable buyers for their products and to reduce post-harvest food loss by linking them to guaranteed buyer demand and storage solutions. Each partner plays a specific role and accrues tangible benefits. Rockefeller plays the role of systems integrator, connecting the different organizations and reducing overall risk for collaboration, prototyping, and learning.

AGCO delivers solar-powered cold storage units to Meru Greens. Although successful in India, these units have not been tested in Kenya. AGCO is provided with a low-risk opportunity to prototype the product in the African context. Rockefeller will quantify the results of the units, identifying how they are used and what the business case might look like in terms of costs and potential revenues. As Jason Colwell, Managing Director, GSI Europe, Africa, and Middle East, says, "Africa is the last frontier, and we want to get on the ground early. We see this as a learning opportunity to understand how these markets work. If Rockefeller can quantify the price point and the business model, we can start to engage with some local organizations to procure equipment so that we can reduce costs to a reasonable level. From our perspective, if the market demand is there, Rockefeller can help us connect the pieces."

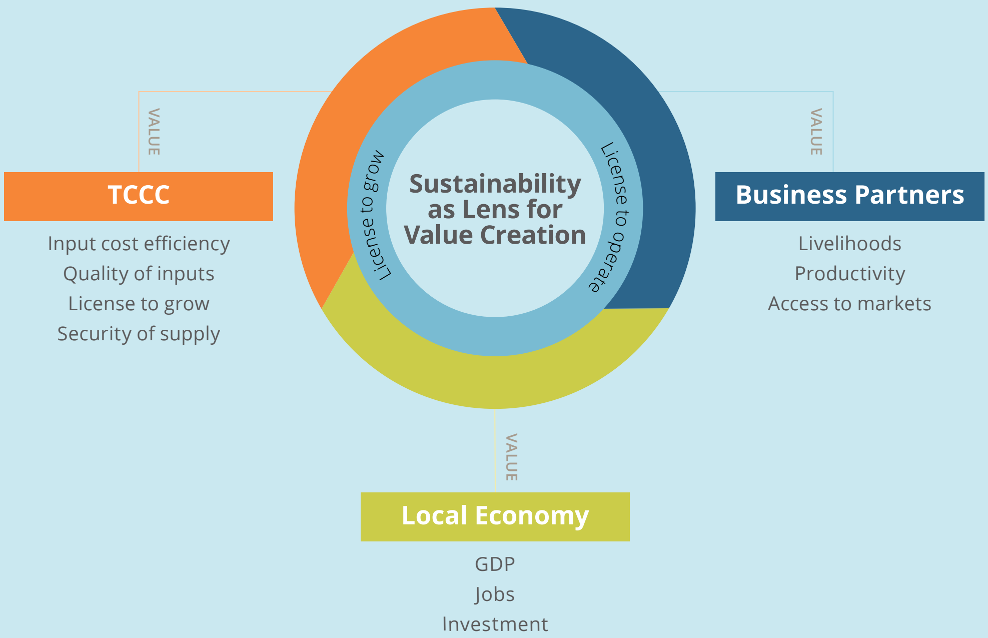
Meru Greens owns and operates the storage units, training farmers on their benefits and how to use them. They also provide transportation from the aggregation centers to the storage units and to the end markets in Nairobi and other cities. TechnoServe provides technical assistance to farmers to ensure they can deliver enough high quality mangoes to meet Meru Greens' product demand.

As Rosemary Muthomi, founder of Meru Greens, says, "Post-harvest food loss is a major challenge for my company. I see a big investment opportunity in partnering with Rockefeller to use solar coolers and aggregate farmer produce because it enables me to better manage my supply chain, reduce my sourcing costs and as a result expand my business. With Rockefeller, we plan to quadruple the production of mangoes." This partnership enables Rockefeller to demonstrate the market opportunity for the private sector to build sustainable and efficient supply chains and address post-harvest food loss.

ROCKEFELLER'S SHARED VALUE PARTNERSHIP WITH COCA-COLA

The Coca-Cola Company is the largest beverage company in the world—and it views Africa as a key growth market. Coca-Cola has committed to invest USD $17 billion in Africa between 2010 and 2020. This investment will fund new manufacturing lines, cooling and distribution equipment and production; create additional jobs and opportunities across Coca-Cola's African supply chain; and support key sustainability initiatives and programs focused on safe water access, sustainable sourcing, women's economic empowerment, community well-being, and operational efficiency improvements.

"As an organization that has been part of the economic and social fabric of Africa since 1928, we and our local bottling partners have seen, firsthand, the great promise and potential of this dynamic, growing and vibrant continent," says Muhtar Kent, Chairman and CEO of The Coca-Cola Company. "Tapping this potential could accelerate the growth of our business and Africa's emerging economies, making our supply chains more cost effective and enabling sub-Saharan Africa to supply more ingredients to growing markets in Africa and beyond."



Called Source Africa, Coca-Cola's strategy is to secure more consistent and sustainable local ingredients for its products. The strategy will initially focus on sustainable mango and tea production in Kenya; citrus, mango, and pineapple production in Nigeria; and mango production in Malawi. Longer term, the program could expand to focus on sustainable ingredient production in a range of other African countries. Source Africa builds on the experience of Coca-Cola's work in sustainable agriculture, including Project Nurture, a partnership with the Bill & Melinda Gates Foundation and TechnoServe supporting over 50,000 small-scale fruit farmers in East Africa to sustainably grow their crops and income.

Source Africa will work with a broad range of partners to promote sustainable agriculture, enhance processor capacity, promote supply chain efficiency (transportation and logistics infrastructure), raise industry standards (e.g., processing quality), and reinforce and advocate for African sourcing by communicating with stakeholders to convey both the economic and social benefits of sourcing agricultural ingredients from Africa. The ultimate goal of the strategy is to increase the security of supply for Coca-Cola, improve the capacity of Coca-Cola's business partners (e.g., rural livelihoods, productivity and access to markets) and drive local economic benefits (e.g. GDP, jobs, investment), creating a virtuous cycle of direct and indirect benefits for organizations across the value chain.

In order to realize this strategy, Coca-Cola needs to address the post-harvest loss challenge. In the Kenyan mango chain, the majority of loss happens between the time the product is harvested and when it arrives at the processor. As farmers are often located far from the processor (at times, up to 600 km away), one of the main challenges is the sheer distance that farmers need to travel to deliver their mangoes. This travel time translates into very high sourcing costs for Coca-Cola. The challenge is that Coca-Cola does not have visibility into exactly how much post-harvest loss costs and what might be a viable solution to the problem.

Rockefeller is supporting TechnoServe, an agricultural NGO, to study Coca-Cola's Kenyan mango value chain to better understand where exactly loss occurs and how much it costs. The study will play an important role in providing Coca-Cola with actionable insight into their value chain. Rockefeller is also exploring the opportunity to use mobile processing units for Coca-Cola's Kenyan mangoes that could reduce the distance from farm to processor. These small and medium-sized pieces of equipment can be moved from farm to farm to rapidly process mango, significantly shortening the value chain. The fixed cost of these units can also be shared across multiple farmers, while the technology itself reduces both loss and physical labor. Similar to how Rockefeller is currently working with Meru Greens, AGCO/GSI, and TechnoServe, the goal is to reduce the risk for Coca-Cola to test this technology in Kenya.

Coca-Cola sees great value in partnering with Rockefeller to address post-harvest food loss. As Martin Mutura notes, "Rockefeller is assisting us to optimize our supply chain and addresses post-harvest food loss. This means more high-quality fruit at a lower cost, higher profitability—and ultimately this increases our ability to compete more in the marketplace." Rockefeller's partnership with Coca-Cola is empowering the local community, driving value for Coca-Cola, and developing a system of partnerships to address post-harvest food loss.

Conclusion and Looking Ahead

Rockefeller's YieldWise initiative is addressing the post-harvest food loss challenge by creating an system of partnerships that can build the market infrastructure to link supply and demand, increase farmer income, improve food security, and reduce the negative impact of the agricultural industry on the local environment. Post-harvest food loss is a large, urgent, but addressable problem that represents a major shared value opportunity for companies across the value chain. Rockefeller's emergent approach is to help build sustainable and efficient supply chains by understanding corporate sourcing requirements, identifying cost-effective post-harvest loss reducing technologies and practices, prototyping and testing potential solutions, and convening and connecting the right network of partners (e.g., buyers, technology providers, NGOs, and farmer business organizations) to reduce risk and encourage private sector investment in the long-term growth of the market. This strategy leverages the trend of companies prioritizing local sourcing in regions like SSA, while also benefiting actors at all points in the value chain.

The Rockefeller Foundation is making a strong shared value case to address post-harvest food loss, with several innovations that provide best practices for other actors pursuing a system-based approach to shared value around a particular issue:

- **Presenting the problem with a ready-made shared value solution:** Many corporations sourcing locally in rural communities are unaware of the significant impact that post-harvest loss has on their input pricing and quality. Part of the Rockefeller Foundation's strategy is to not only make the private sector aware of this tremendous inefficiency, but to position it as an addressable problem with a shared value solution. Rockefeller is actively working with its partners to quantify exactly where the highest loss exists and quantify the negative impacts of this loss on the business and among the stakeholders in the value chain. By presenting the loss in clear business terms and providing immediate solutions to increase quality, quantity, productivity, and margin, the initiative provides clear incentives for private sector engagement.
- **Illuminating pathways to scale:** Different companies have different reasons that may motivate them to address the post-harvest food loss issue. For some, the reasons may be entirely bottom-line-driven—minimizing loss will be solely driven by a need for efficiency and security of supply. For others, the initial engagement might stem from an interest in social or environmental objectives. Rockefeller will need to be attentive to the issues that are important to different companies, and the solutions that are directed to the specifics of each supply chain. As the initiative moves forward, Rockefeller will need to identify specific geographies, sets of value chains, and technologies that might make it possible to cluster buyers, NGOs, and farmers around specific objectives. This will, over time, bring greater structure to the initiative.
- **Building the system that will enable shared value to thrive:** By convening the actors and matching needs to capacity, the Rockefeller Foundation is building a solid system of partnerships that can enhance shared value activity over time.

In launching YieldWise, the Rockefeller Foundation is re-framing the discussion on rural supply chain issues to focus on post-harvest food loss as a key problem that can be addressed by cross-sector action. The Foundation's key role is to be a systems integrator, knowledge disseminator, and advocate for donors and the private sector to incorporate food loss as a primary driver and to co-create innovative solutions. The opportunity for impact at scale targeting the issue of post-harvest food loss is tremendous, and the model has the potential to illustrate how an ecosystems approach can lay the groundwork for successful shared value collaboration that can be applied to multiple sectors, industries, and geographies in the future.

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