NutriSave Learning Series

NUTRISAVE
WASTE LESS, NOURISH MORE

Waste Less, Nourish More

A Practitioners' Playbook for Reducing Food Loss and Waste While Increasing Access to Nutrition

TechnoServe
Business Solutions to Poverty

Gates Foundation

UK International Development
Partnership | Progress | Prosperity

Contents

Foreword

This NutriSave Playbook is intended as a practical resource for those delivering projects and policy at the intersection of agri-food systems, nutrition, climate action and markets. It features insights from the learning journey of NutriSave, a multi-year program in Kenya designed to reduce food loss and waste (FLW) while improving access to affordable nutritious foods among low-income consumers. Led by TechnoServe with support from the Gates Foundation (GF) and UK International Development, NutriSave designed and tested solutions to redirect excess and imperfect fruits and vegetables into affordable domestic products, supported by viable business cases and private sector partnerships.

Food systems practitioners are increasingly expected to address multiple big challenges at once and in ways that are simultaneously impactful, commercially viable and scalable. The pathways for doing so are rarely linear. They require experimentation, iteration, partnership building and disciplined decision making that is grounded in evidence and context. They also need reflection on one's own efforts alongside learning from others.

This Playbook draws on the NutriSave experience to translate learning into recommendations for the field – particularly for implementing partners, donors and private sector partners.

Structured as a practical guide, the Playbook begins with a brief context section on the challenges in focus and then provides a framework for action in the executive summary, followed by a synthesis of key takeaways for practitioners, development partners and private sector collaborators. What follows is a more detailed account of the NutriSave journey, presenting objectives, approach, lessons learned and recommendations for each step across the three program stages, along with key decisions made at each stage gate. Following the conclusion, the Appendix provides additional frameworks and tools.

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Context: The Challenge

Food loss and waste (FLW) remains a major barrier to global food security, resource efficiency and equitable access to nutritious diets. Roughly one-third of all food produced worldwide is lost or wasted across the supply chain (FAO 2011; UNEP 2023)–about one billion tons of edible food that goes uneaten by humans each year, even as around three billion people cannot afford a healthy diet (UNEP 2023; FAO/World Bank 2025). These losses not only reduce food availability but also occupy agricultural land equivalent to the size of China, put strain on freshwater and other natural resources, undermine livelihoods and contribute substantially to climate change, accounting for an estimated 8 to 10 percent of global greenhouse gas emissions annually (FAO 2022; IPCC 2019; WRI 2024).

These global challenges are mirrored in Kenya, with similarly high levels of FLW across key value chains. FAO estimates that 30%-40% of food produced in Kenya is lost or wasted due to a range of supply chain challenges, resulting in lower producer incomes, higher food prices, and environmental degradation (FAO 2025). This is occurring in a country where nearly a third of the population is food insecure, including nearly 3 million people facing acute food insecurity (IPC 2025; WFP 2025). Only a very small share of the population consumes recommended amounts of fruits and vegetables (Kenya Ministry of Health 2025; FAO 2024).

FLW and access to affordable nutritious food are persistent food systems challenges. They have no single root cause, are shaped by multiple actors, and are constantly evolving. These systems are also characterized by uneven power dynamics, weak coordination and limited trust between actors. These factors inhibit collaboration, slow the adoption of new practices and reinforce existing inefficiencies. Shocks such as price volatility, climate events, policy changes, or shifts in consumer behavior can quickly alter incentives and outcomes.

These interlocking problems also present co-beneficial opportunities. Reducing FLW and improving nutrition access can be mutually reinforcing when interventions are designed to be sustained through markets. Where losses occur in nutritious value chains, and where still-edible produce can be redirected in forms that align with consumer demand, FLW reduction can become a solution pathway for increasing low-income consumers' access to nutritious food.

Private sector engagement is critical to finding solutions. On the supply side, commercial entities control many of the key leverage points for the food systems challenges in focus. Losses across production, aggregation, processing, transport, retail and food service are often driven by handling practices, storage and logistics constraints, quality standards and market incentives. On the demand side, businesses' product formulation, pricing, distribution and advertising are fundamental to low-income consumers' economic and physical access to nutritious food products. Thus, private sector actors are in a dominant position to influence outcomes in ways that public or civil society actors alone cannot. Private sector actors also bring the capacity to innovate, invest, scale and sustain solutions. They can translate insight into operational change through adjustments in manufacturing, packaging, processing and distribution, and they can replicate successful models through procurement systems, supplier requirements and new market channels.
For all these reasons, engaging private sector actors early, consistently, and with language and logic persuasive to commercial decision-making is critical. Tactics for this are suggested throughout this Playbook.

These challenges, and the power of commercial collaboration, motivate NutriSave's focus. The program treats FLW and nutrition access not as separate agendas, but as interconnected and systemic challenges that can be addressed through evidence-driven, commercially grounded solutions.

Executive Summary

Framework: A Replicable Three-Stage Approach

This framework reflects the approach used by the NutriSave program, implemented by TechnoServe, which seeks to reduce food loss and waste (FLW) and increase access to nutritious foods for low-income consumers in Kenya.

Stage 1 Exploration

Conduct foundational research to uncover key drivers of food loss and generate context-specific ideas for intervention

- **Conduct market scans** to prioritize value chains
- **Review academic literature** to identify solutions already proposed
- **Conduct Human-Centered Design sprints** and map the stakeholders and dynamics around selected value chains

Stage 2 Piloting

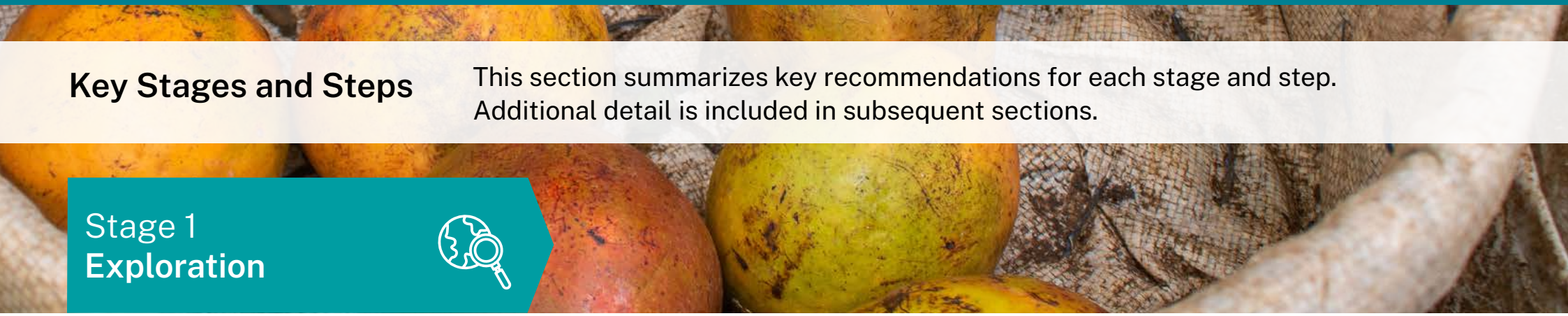
Implement pilot programs for shortlisted initiatives to validate assumptions and assess commercial viability

- **Pilot interventions** through low- and high-fidelity prototyping, ideally alongside private sector actors
- **Adapt interventions** and validate assumptions as testing progresses
- **Test business cases** based on real-world operational data

Stage 3 Commercialization

Replicate and commercialize proven models while expanding into new markets

- **Standardize and codify** the proven operating models
- **Establish scalable delivery partnerships** for continued implementation



Key Stages and Steps

This section summarizes key recommendations for each stage and step. Additional detail is included in subsequent sections.

Stage 1 Exploration

Step 1
Conduct Initial Market Scan

- Align early on a shared "North Star" for success
- Engage market actors and sector experts from the outset

Step 2
Review and Synthesize Existing Evidence

- Synthesize academic literature and other evidence on food loss & waste in prospective value chains
- Use a funnel approach to prioritize value chains for further focus
- Invest early in evidence-based research with specialized partners

Step 3
Conduct Human-Centered Design Sprints

- Build solutions by deeply understanding ecosystem actors and incentives
- Use structured ideation to expand the range of potential interventions
- Combine Human-Centered Design with rigorous commercial and market analysis, co-created with market actors

Overarching Recommendations

- Introduce structured stage gate decision points to ensure the program delivers on core objectives
- Use tools for prioritization, such as the framework described in the Appendix that balances desirability, feasibility, viability and impact

Stage 2
Piloting

Step 4
Deploy Pilot Interventions with Partners

- Test concepts in real-world market environments with increasingly sophisticated prototypes
- Engage prospective commercial partners to co-design, observe, and benefit through insights from prototyping

Step 5
Validate Assumptions from the Exploratory Phase

- Create intentional strategic pause points to reassess assumptions and refine priorities
- Stop, pivot and/or recalibrate activities as new evidence and insight emerges

Step 6
Test Business Cases Using Operational Data

- Engage private sector actors early and frequently
- Conduct business case validation alongside prototype development
- Integrate comparative case studies and cross-market analysis

Overarching Recommendations

- Use rapid prototyping and market testing to narrow concepts to the most promising solutions
- Involve private sector partners to build momentum toward commercial partnerships
- Transition to commercialization only when solutions demonstrate credible commercial viability
- Build teams with strong commercial expertise

Stage 3
Commercialization

Step 7
Standardize and Codify the Proven Operating Model

- Document proven interventions as clear, replicable operating models
- Distinguish between core elements that must remain consistent and adaptable elements that can vary by market
- Embed monitoring and learning systems

Step 8
Establish Scalable Delivery Partnerships

- Form partnerships with private sector and ecosystem actors capable of scaling solutions commercially
- Structure partnerships to ensure long-term commercial sustainability
- Codify implementation models before scaling

Crosscutting Takeaways for Food Systems Stakeholders

There is much to learn from the NutriSave experience detailed in the following sections. In complement to the step-specific suggestions below, several crosscutting insights stand out as critical to success.

Practitioners

- **Bring an experienced commercial lens to all phases of the program**, ensuring that commercial realities and considerations are prioritized early and throughout.
- **Build trust early**, especially with private sector partners, through early engagement, rigorous market analysis and collaborative real-world testing of concepts.
- **Create structured, regular strategic pause points** with funders and key partners to revisit priorities, validate assumptions and recalibrate decisions as evidence emerges.
- **Employ a beginner's mindset** and an entrepreneurial approach (prototype, learn, "fail fast" and iterate) so learning drives quick adaptation.

Development Partners

- **Design for flexible, learning-oriented funding** that supports experimentation, adaptation and course correction.
- **Build in reflection points** and allow space to stop, pivot or recalibrate investment based on evidence. Complex systems change rarely follows a linear path; adaptive approaches strengthen outcomes and reduce wasted effort.
- **Recognize that donors' financial support can also be instrumental in catalyzing impactful and commercially viable solutions** that may be too conceptual, risky or costly for small-scale private sector actors to develop on their own.

Private Sector Actors

- **Seize the opportunity in development partnerships:** they can generate tangible commercial value when they are grounded in credible market analysis, user insight and real-world testing.
- **Recognize that early engagement, clear articulation of business cases, and collaborative experimentation reduce risk and create opportunities** for investment in solutions that can reach underserved markets, like low-income consumers. These partnerships can also strengthen business resilience, reputation and competitiveness.

The NutriSave Program: Lessons and Insights

This section shifts from overarching recommendations into a more detailed description of the NutriSave experience across the Stages and Steps.

Stage 1: Exploration

Step 1 Conduct Initial Market Scan

Objectives

Use research to hypothesize where food loss and waste (FLW) occurs within the Kenyan horticulture system and where intervention might advance the goals of the NutriSave program.

Approach

- **Consultative research:** To inform the initial scope, the NutriSave team conducted in-depth research into the Kenyan horticulture sector to identify wastage trends and hotspots. Through speaking with a wide range of market actors across multiple value chains, the team sought to understand constraints, incentives and behaviors influencing losses. Observing farms, packhouses and markets also helped identify where losses occur.

- **Hot spot analysis:** The team then conducted deeper "hot spot" analysis of the horticulture value chain ecosystem to understand which products are produced at scale, which are most demanded by consumers, and which experience the highest levels of loss. This analysis also examined the drivers of losses across the system, including gluts, pests and disease, poor post-harvest handling, market rejects and inadequate cold chain infrastructure. This work quantified associated economic losses and assessed nutrition gaps in available food products. It also examined where interventions could plausibly deliver nutrition, climate and business benefits.

- **Existing solutions evaluation:** This initial market scan also explored potential solutions already operating within the market. This involved speaking with firms that have developed viable approaches to address food loss and waste within the Kenyan context. NutriSave integrated financial landscape analysis into this element to scope financial pathways to enable potential solutions, including opportunities for co-financing and investment.

Lessons Learned

NutriSave's experience reinforced the importance of grounding early program direction in robust, context-specific evidence. Initial hypotheses about where value could be created were meaningfully refined through direct engagement with market actors and observation of real-world dynamics. This early-stage work not only surfaced where losses were occurring, but also challenged assumptions about which segments of the market were most aligned with the program's nutrition and affordability objectives.

Key Recommendations

Align on a shared "North Star" for success: Practitioners and donors should agree on the problem scope and define success in practical terms so that the ambition is clear and can guide program implementation from the outset.

Incorporate collaboration from the outset: It is valuable to involve market actors early to build trust and sense-check where they see opportunity and constraints, and to engage sector experts to provide evidence and data.

Stage 1: Exploration

Step 2 Review Academic Research

Objectives

Complement market observations with academic and consumer research to strengthen the evidence base and identify prospective interventions.

Approach

- **Literature review:** NutriSave conducted a robust literature review to assess existing evidence on food loss and waste reduction and nutrition access globally. This review examined available white papers and research studies documenting tested interventions and approaches.
- **Additional research:** To address gaps in the literature, NutriSave then conducted primary research focused on the Kenyan context. Consumer behavior research examined demand for fruits and vegetables as well as purchasing habits and consumption patterns among low-income households. The research aimed to ensure that any interventions would improve access to safe, affordable and nutritious fruits and vegetables for this demographic. Primary research incorporated structured research questions and sought broad representation across urban, peri-urban and rural contexts to capture variation in consumer behavior and market dynamics.

Value Chain Prioritization

Criteria	Remaining #
Production volume	15
Nutrition	11
Demand	9
Perishability	7
Affordability	3

Filtering criteria used by NutriSave

Lessons Learned

The integration of academic research with primary data collection proved critical in strengthening the program's evidence base and refining its focus. NutriSave's experience demonstrated that a structured "funnel" approach, starting with broad literature and narrowing through targeted research and prioritization exercises, can effectively identify high-potential value chains. Partnerships with specialized research organizations were particularly valuable in generating credible, context-specific insights that could inform both design and decision-making.

Key Recommendations

Use a "funnel approach" to identify a viable set of value chains: This step is aided by a thoughtful research sequence, starting broad with available data, then progressively narrowing using new evidence from local observation. The Value Chain Prioritization figure illustrates the criteria that NutriSave used in this exercise.

Conduct evidence-based research early and with specialized partners: NutriSave's experience across Steps 1 and 2 reinforced the essential role of investing in early evidence gathering to shape strategic goals and collaboration. The program relied on collaboration with specialized partners including Busara, Maitri, IDEO.org and local universities to generate the necessary consumer, market and financial insights.

Step 2

NutriSave Stage Gate Decision Point

The insights generated through the initial market scan and academic research can be used as a “funnel” to identify high-potential value chains for deeper exploration. At this stage gate, the NutriSave team needed to decide which value chains to prioritize for further focus. Drawing on collected evidence and research and applying value chain prioritization criteria, three priority value chains were identified: (mango, tomato and indigenous leafy vegetables) alongside a business-to-business technology platform.

Key Recommendations

Create “go / no-go” stage gates throughout the program to determine which solutions warrant ongoing investment: Such decision points focus strategic decision making and allocate remaining resources where the evidence supports true investment and scale potential.

Step 3

Conduct Human-Centered Design Sprints

Objectives

Research the ecosystem around each value chain, refine the problems to be tackled, and generate ideas that address identified food loss and waste challenges while improving nutrition access.

Approach

- **Human-Centered Design:** NutriSave partnered with IDEO.org and a Stanford fellow to apply the Human-Centered Design (HCD) process. HCD uses a unique approach comprising the following steps: Empathize (Understand the User), Define (Clarify the Problem), Ideate (Generate Solutions), Prototype (Make Ideas Tangible), and Test (Learn and Iterate). In this exploratory stage, NutriSave put emphasis on the first three of the HCD framework's steps: *empathize, define and ideate.* The full HCD approach is described in the Appendix.

- **Empathize:** The first step, *empathize*, focused on understanding the lived experiences, incentives and constraints of actors across each of the tomato, mango and indigenous leafy vegetable value chains. The team used multiple types of detailed research to collect this data, such as observing a "day in the life" of various actors, observing market dynamics, and conducting interviews and focus groups. Engagement with traders, producers and other market participants helped build trust and generated insights to map the intricate dynamics in each ecosystem. Key insights were articulated in visuals such as ecosystem maps and the creation of "archetypal" stakeholders; full mappings are included in the Appendix.

- **Define:** The team then conducted several activities to *define* the problems in focus. Insights gathered during field research were translated into "How might we?" problem statements that framed the opportunity space for innovation.

- **Ideate:** NutriSave then moved into an *ideation* phase, focused on generating a wide range of potential solutions through creative thinking. Using structured ideation techniques, collaborators identified more than 300 ideas spanning production, aggregation, processing, distribution and consumption. They prioritized these using a clear framework that scored against four categories–desirability, feasibility, viability and impact–to select 65 leading ideas, and eventually the nine most promising concepts. See Appendix for additional detail.

Step 3

Lessons Learned

NutriSave's application of Human-Centered Design demonstrated the value of deeply understanding user behavior and value chain dynamics before advancing solutions. The empathize and define stages generated nuanced insights into how different actors operate within the system, while structured ideation expanded the range of possible interventions beyond initial expectations. This process also helped build trust with market participants, which proved essential for subsequent stages of testing and collaboration.

At the same time, the experience highlighted the limitations of relying on design-led approaches in isolation. While HCD was effective in generating and refining ideas, it did not fully address questions of commercial viability. The program would have benefited from integrating market analysis and commercial perspectives earlier in the process to ensure that promising ideas were grounded in realistic pathways to scale. This reinforces the need to sequence analytical tools deliberately and ensure that creativity is balanced with commercial rigor.

Key Recommendations

Invest in understanding the ecosystem: True solutions emerge from understanding people and systems, not just technical gaps. The process of "empathizing" through on the ground observation also builds relationships and trust, which is critical during this phase.

Embrace the power and mindset of ideation: Structured ideation expands options by unlocking creativity. This can create an exciting scope of possible interventions, but it requires the embrace of a playful "beginner's mind" and the curation of an encouraging space for "wild ideas".

Combine and sequence analytical tools strategically: NutriSave's experience demonstrated that no single framework or approach is sufficient for addressing complex food systems challenges. The HCD steps above provided valuable contributions, but were insufficient without parallel, rigorous commercial and market analysis to ensure solutions were grounded in market realities.

Step 3

NutriSave Stage Gate Decision Point

This phase produced a sufficiently comprehensive understanding of the three selected value chains (tomato, mango and indigenous leafy vegetables) to support a shift from broad ecosystem learning to targeted solution development. This prioritization process resulted in the selection and development of nine concepts across the three value chains, along with an additional crosscutting solution idea focused on a digital platform. These concepts were deemed sufficiently promising to advance into prototyping and testing in the next phase of the work.

Key Recommendations

Use a clear decision-making process: Decisions should be informed by the right mix of expertise. The exact combination of talent can vary by project, but should always include those with a commercial mindset to ensure business relevance, those with technical expertise to stress-test viability, and those with contextual knowledge to ensure the ideas being advanced are appropriate for the cultural context.

A framework such as the “Desirability/Feasibility/Viability/Impact” (DFVI) ranking system can aid in effective, aligned and transparent choices. The process used by NutriSave adapted an existing tool to incorporate the “I” of impact. This framework allowed the team to systematically weigh consumer demand, operational practicality, commercial logic and potential nutrition and FLW outcomes.
See Appendix for the full framework.

Stage 2: Piloting

Step 4

Deploy Pilot Interventions with Partners

Objectives

Prototype potential solutions in real-world settings with increasing fidelity, continuously refining them through iterative user engagement.

Approach

- **Prototype preparation:** To move from conceptual design to practical insights, NutriSave and its partners then implemented a structured prototyping process grounded in the Human-Centered Design (HCD) methodology. To conduct these prototypes, the team designed tests to generate rapid feedback from real users and market actors. For each concept, the team defined the purpose of the test, the users or value chain actors to be engaged and the specific learning questions to be explored. The overarching goal was to test core assumptions quickly and directly in real market environments rather than relying solely on theoretical analysis or stated consumer preferences.

- **Moving from low-fidelity to high-fidelity testing:** The prototyping process followed an iterative progression from low-fidelity to higher-fidelity testing. Early prototypes were intentionally simple and focused on assessing basic desirability and user understanding. These initial tests helped determine whether consumers recognized the value of a concept and how they interpreted the proposed solution. As ideas demonstrated promise, more developed prototypes were introduced to explore usage patterns, pricing sensitivity and operational considerations such as sourcing, handling and distribution. As concepts matured further, higher-fidelity prototypes were deployed to refine product functionality, evaluate operational feasibility and assess how the solutions would perform within real market systems.

- **Testing in realistic settings:** Throughout this process, NutriSave worked closely with ecosystem partners and market actors to test solutions in realistic settings. Products were introduced directly into markets where traders and consumers could interact with them as they would with any other product. This enabled the team to observe purchasing behavior, product handling and consumer reactions in real time.

Feedback was systematically captured across each stage of testing, allowing the team to identify which aspects of the concepts resonated with users, where confusion or barriers emerged and what adaptations were needed to strengthen the design.

Example: One example of this approach was the Kadogo Delight concept, which explored consumer willingness to substitute processed tomato products for fresh tomatoes in low-income markets. Traders were provided with simple products such as tomato paste in small sachets, tomato powder and bouillon cubes, along with basic assets including recipes and informational posters. Consumers were then guided through structured interactions designed to assess product knowledge, potential use cases and willingness to pay. By observing how consumers responded in a real market context, the team was able to capture behavioral insights that would not have been revealed through surveys or interviews alone.

Step 4

- **Additional insights gained:** Prototyping also allowed NutriSave to assess broader market and operational factors beyond consumer response. Together with private sector partners, the program evaluated product quality, safety, competitiveness and regulatory considerations associated with introducing new products into the market. Additional laboratory testing was conducted in some cases to assess the nutritional composition of competing products and ensure that proposed solutions could meet consumer expectations while remaining affordable.

It is important to recognize that maintaining a consistent focus on nutrition can be challenging when developing commercially viable products. For example, NutriSave was able to demonstrate a clear market opportunity, business case and implementation approach for a nutritious tomato paste in partnership with a local producer. However, a combination of raw material costs, consumer preferences and competitive market pressures ultimately led to a shift toward a more diluted product formulation. This outcome also highlights the need to strengthen and evolve current standards to better support nutritious food offerings in the market.

This example highlights an inherent tension between development objectives, such as improving nutrition outcomes, and the commercial realities faced by private sector actors. While these priorities can at times be aligned through thoughtful product design, pricing strategies and targeted consumer engagement, doing so requires deliberate effort and careful management. Programs of this nature must therefore anticipate and actively navigate these trade-offs, recognizing that alignment between nutrition and commercial viability may not always be fully achievable.

Lessons Learned

The prototyping phase demonstrated the value of iterative, real-world testing in refining solutions and surfacing behavioral insights that would not emerge through research alone. Low-fidelity prototypes proved particularly effective in generating rapid feedback at minimal cost, enabling the team to test assumptions, identify user preferences and adapt concepts quickly. Testing in live market environments, especially in collaboration with private sector actors, also helped ensure that solutions were grounded in market realities.

This phase also highlighted inherent tensions between development objectives and commercial considerations. Efforts to design products that were both nutritious and affordable often encountered constraints related to cost structures, consumer preferences and competitive pressures. Navigating these trade-offs required continuous adjustment and close engagement with partners, underscoring the importance of designing for both impact and market viability from the outset.

Key Recommendations

Recognize the value of low-fidelity prototypes: Critical insight comes from testing under real-world constraints with the targeted consumer demographic. Low-fidelity prototypes can produce highly useful insights with low investment, allowing for quick iteration.

Iterate quickly: Adopting an entrepreneurial mindset, the power of prototyping lies in gathering information rapidly with relatively low investment, allowing for quick pivots and new testing. This mindset can be unfamiliar to development practitioners and may take deliberate leadership and encouragement for the team to embrace this approach.

Step 4

NutriSave Stage Gate Decision Point

Prototyping that integrates rapid iteration can further clarify a select set of viable products. For NutriSave, this process elevated four products to advance:

1. Tomato paste sold in small sachets
2. Mango juice sold in small servings through backpack distribution
3. Indigenous leafy vegetable powder integrated into porridge
4. A digital coordination platform connecting supply and demand actors

Key Recommendations

Involve prospective commercial partners in prototyping: Conduct testing alongside private sector actors, where possible, to ensure prototypes reflect market constraints and to build momentum toward partnership.

Step 5

Validate Assumptions from the Exploratory Phase

Objectives

Revisit assumptions generated during earlier stages and refine interventions based on evidence.

Approach

- **Reassessment:** In this step, the team revisited insights generated during the first "exploratory" phase of the program to refine, consolidate or discontinue products based on emerging evidence. In this step, for example, NutriSave embraced a more precise definition of "non-augmented" nutrition for its "impact" criterion. This refinement reflected greater emphasis on products that could deliver nutritional value in their base form without significant processing or additives.
- **Adjustments:** As a result, the program removed mango juice from its product set. While the product demonstrated consumer appeal and commercial potential, it was ultimately classified as "augmented nutrition" and versions with a sufficiently high percentage of fruit juice were not economically accessible to low-income consumers. In parallel, market analysis reemphasized the promise of two interventions–washing, cutting, peeling and packaging (WCPP) and the transportation of excess produce–that were reprioritized for programmatic consideration.

Lessons Learned

Revisiting earlier assumptions through structured reflection proved essential in refining the program's direction. NutriSave's experience shows the value of pausing to reassess key decisions in light of new evidence, even when this resulted in difficult trade-offs or the discontinuation of promising concepts. The introduction of a more precise definition of "non-augmented" nutrition, for example, provided greater clarity but also required the program to deprioritize certain interventions.

This step highlighted the importance of building flexibility and emergence into program design and decision-making processes. Regular strategic reviews enable teams to remain responsive to emerging insights and ensure that resources are directed toward the most viable and impactful opportunities. Without these checkpoints, programs risk continuing to invest in approaches that are misaligned with their core objectives.

Key Recommendations

Recognize the value of strategic pauses: Curating regular strategic reviews, especially in collaboration with key partners, can bring fresh clarity to the program and its priorities.

Step 6

Test Business Cases Based on Operational Data

Objectives

Develop robust business cases that translate prototyped concepts into commercially viable investment opportunities.

Approach

Market analysis: With four prototypes prioritized, NutriSave shifted from exploratory testing to more rigorous market analysis and business case development. The team commissioned a comparative review of industry best practices related to each concept. Drawing on examples from markets such as Egypt and Nigeria, this work examined how similar products have been developed, marketed and scaled. Comparative case studies also introduced an essential dose of realism about operational complexity and success drivers. By looking beyond the Kenyan context, NutriSave was better able to anticipate challenges related to manufacturing, distribution, regulation and competition. This realism improved both internal decision making and the credibility of the program with potential investors and partners.

Business case development: NutriSave also commissioned Maitri Capital to develop detailed business cases for each prototyped product. This analysis translated earlier design and prototyping insights into investment-relevant assessments, including prospective partner recommendations, market overviews for prototyped products, competitive landscape analysis, cost structures, financial projections and key risks with mitigation strategies.

Low-income consumer research: To strengthen the demand side evidence base, NutriSave commissioned Busara to augment earlier low-income consumer research conducted by IDEO.org. This generated more robust quantitative data on consumer preferences, purchasing behavior and price sensitivity, ensuring that product design and business case assumptions were credible for private sector decision-makers.

Step 6

Lessons Learned

NutriSave's experience underscored the critical role of rigorous market and financial analysis in translating promising concepts into viable investment opportunities. While earlier stages generated a strong pipeline of ideas, it was detailed business case development, comparative market analysis and consumer research that ultimately provided the credibility needed to engage private sector partners. Cross-market comparisons and unit economics helped ground expectations and clarify the conditions required for scale.

The program also demonstrated that delaying commercial analysis can lead to inefficiencies. Extended focus on early-stage design without parallel validation of business fundamentals resulted in additional rework and delayed decision-making. Integrating commercial analysis earlier in the process would have enabled faster prioritization and more efficient allocation of resources, reinforcing the importance of aligning innovation with market realities from the outset.

Finally, NutriSave's experience has begun to reveal the potential power of approaches like results-based financing models, which link payment to the achievement of specific, measurable outcomes. Having a compelling business case doesn't necessarily guarantee that the private sector will invest to produce and market non-augmented foods to consumers; other factors/levers will apply. Results-based models may help to close the trust and collaboration gaps between commercial players, development partners, and practitioners.

Key Recommendations

Build a commercially minded team: A key aspect of NutriSave's success was the commercial credibility and capability of its team. While such fluency with market concepts and actors is part of TechnoServe's approach, it is not commonplace among all development actors. To build solutions that will attract real investment from private sector players and be sustainable in the marketplace, the team should have commercial instincts in its DNA.

Engage private sector partners early and in practical ways: Programs should engage private sector players and market actors early and often. They should create opportunities for commercial partners to benefit from participation, such as gaining access to user insights, market intelligence and customer intelligence.

Step 6

NutriSave Stage Gate Decision Point

NutriSave formalized partnerships with private sector actors aligned with each product concept. These included TruFoods for tomato paste; the AKMT mango traders' association for mango juice (active until the product was deprioritized); Smart Logistics Solutions for drying indigenous leafy vegetables, and Unga Group Limited for integrating them into fortified porridge flour; and most recently the technology company Soqo, with Tigoni Grown, to implement the digital food supply chain platform supporting market coordination.

Key Recommendations

Integrate market analysis and business case validation early: NutriSave's experience highlights the importance of grounding innovation in robust market analysis and early business case validation. Cross-market comparisons and targeted financial analysis helped clarify cost structures, pricing pressures and scale requirements, while detailed unit economics strengthened feasibility assessments and credibility with potential partners. Conducting this analysis alongside prototype development ensures that promising ideas are tested not only for user appeal but also for commercial viability. Early commercial analysis can narrow options sooner, reduce overinvestment in less viable concepts and translate promising innovations into propositions that private sector partners view as credible investment opportunities.

Stage 3: Commercialization

Step 7

Standardize and Codify the Proven Operating Model

Objectives

Translate successful pilot interventions into clearly defined and replicable operating models that can guide implementation and scale while preserving the program's commercial, nutrition and food loss reduction objectives.

Approach

- **Insight consolidation:** Following pilot testing and commercial validation, the program will consolidate operational insights generated during marketplace trials such as infrastructure requirements, operational processes and cost structures. The goal is to identify the core elements that consistently drive success and distinguish them from elements that may vary depending on local market conditions. Capturing these elements will allow the model to be clearly understood by potential partners and will provide a practical framework for implementation in new contexts.

- **Digital marketplace example:** For example, the operating model will incorporate lessons emerging from the development and testing of the digital market coordination platform. Through the pilot phase, nearly 150 markets were mapped and around 25 metric tons of fruits and vegetables were redirected through engagement with over 70 traders. A minimum viable product of the Soqo Exchange platform has been developed to enable real-time trading, order management and distribution coordination, with both open and closed platform models tested.

- **Insights from the digital marketplace:** Early results highlight the importance of trust-building in informal markets where transactions are typically cash-based and traders rely heavily on personal relationships. At the same time, platform development has underscored the technical and operational complexity involved in deploying digital solutions in fragmented mobile environments. The project will now prioritize testing of the most critical operational, market and technical assumptions. Insights from this experience will inform how digital coordination tools can be incorporated into the standardized operating model to support value chain coordination and reduce food loss and waste.

Lessons Learned

As the program moves toward consolidation and scale, NutriSave's experience highlights the importance of translating pilot insights into clear and replicable operating models. Successful interventions are not defined solely by product concepts, but by the underlying systems, partnerships and processes that enable consistent delivery. Codifying these elements is essential to ensure that learning is retained and that future implementations can build on proven approaches rather than starting from first principles.

This phase also reinforces the need to balance standardization with flexibility. While core components of the model must be clearly defined, local market conditions will require adaptation. Embedding monitoring and learning mechanisms within the operating model will be critical to ensure that it remains responsive to evolving contexts and continues to deliver both commercial and development outcomes.

Key Recommendations

Scalable models should distinguish between core and adaptable elements: This distinction will help players identify essential elements that must remain consistent versus those that can and should respond to local market dynamics.

Monitoring and learning systems should be embedded within the operating model: This can enable continuous improvement as implementation expands.

Step 8

Stage 3: Commercialization

Establish Scalable Delivery Partnerships

Objectives

Establish delivery partnerships with private sector and ecosystem actors that can sustain and scale proven solutions while aligning incentives across the value chain.

Approach

- **Expanding collaboration:** Building on relationships established during earlier stages of the program, NutriSave will identify partners with the operational capacity, market reach and strategic alignment required to implement solutions at scale. These partners may include processors, distributors, traders, logistics providers and digital platform operators. Engagement will prioritize actors able to integrate the operating model into their existing business activities and expand implementation through their networks.

- **Structuring for scale:** Partnership models will be structured to ensure commercial sustainability for participating firms while maintaining alignment with the program's development objectives. This will involve defining commercially viable arrangements related to sourcing, production, distribution and revenue generation. As partnerships mature, the program will support expansion into new geographic markets and product categories. Lessons from early implementations will inform replication strategies and guide how the operating model can be adapted to different contexts while maintaining its core principles.

Lessons Learned

NutriSave's experience demonstrates that sustainable scale is ultimately driven by strong, commercially viable partnerships. Early and practical engagement with private sector actors helped build trust, align incentives and create a foundation for collaboration. Where partners were actively involved in testing and refining solutions, they were more likely to invest in and sustain those solutions over time.

At the same time, the process highlighted that partnership development requires deliberate effort and alignment. Differences in expectations, timelines and risk tolerance can create challenges if not addressed early. Structuring partnerships around clear commercial incentives, while maintaining alignment with development objectives, is essential to ensure that solutions can operate independently and continue to scale beyond the life of the program.

Key Recommendations

Programs should codify implementation models before scaling: This will ensure that lessons from pilot interventions are captured and operational risks are reduced.

Partnership structures should be designed for long-term sustainability without reliance on continued program support: Private sector players will sustain solutions only when a product has demonstrated genuine commercial value.

Conclusion

NutriSave represents a substantial achievement by TechnoServe and its partners, not only for the tangible progress made in Kenya's fresh fruit and vegetable sector, but for the integrity with which the program has reflected on its own journey via this Playbook. The program did not take the shortest path, and it did not arrive without setbacks; yet, as the team has articulated, "We reached our destination … one hour later." That willingness to acknowledge complexity, adapt course and share lessons openly is itself a mark of success.

Ultimately, NutriSave is not an endpoint, but a contribution to a broader learning agenda. Its experience offers a practical example of how system-level challenges can be approached through market-based collaboration, evidence-driven decision making and adaptive program design. The challenge ahead is not to duplicate NutriSave, but to adapt its lessons in new settings in pursuit of food systems that are more efficient, nutritious, inclusive and resilient.

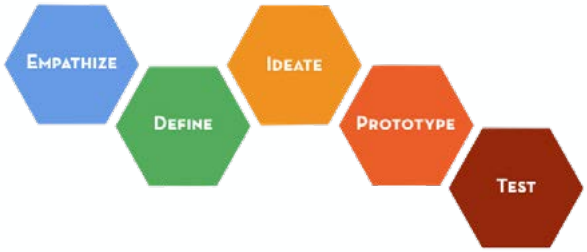
Appendix: Additional Tools and Examples

Tool

Human-Centered Design Overview

HCD Process

TechnoServe used a HCD process in the first phase of the project to identify and test different solution options.



	Empathize	Define	Ideate	Prototype	Test
Goal	Understand the user	Define target problem(s)	Generate many solution ideas	Build solution components for testing	Put your prototypes in front of people
Activities	• Interview users • Generate core insights based on interviews	• Synthesize empathy research to identify themes	• Brainstorm • Rank and filter ideas	• Determine key variables to test • Build prototype materials	• Run tests
Outputs	• Insights • Personas • Ecosystem maps	• Core problem definition using "How Might We" questions	• Ranked list of solution ideas	• "What Would Have to Be True" statements • Prototypes for field testing	• Short list of concepts to pilot

This methodology is available at www.ideo.com/journal/design-kit-the-human-centered-design-toolkit.

Tool

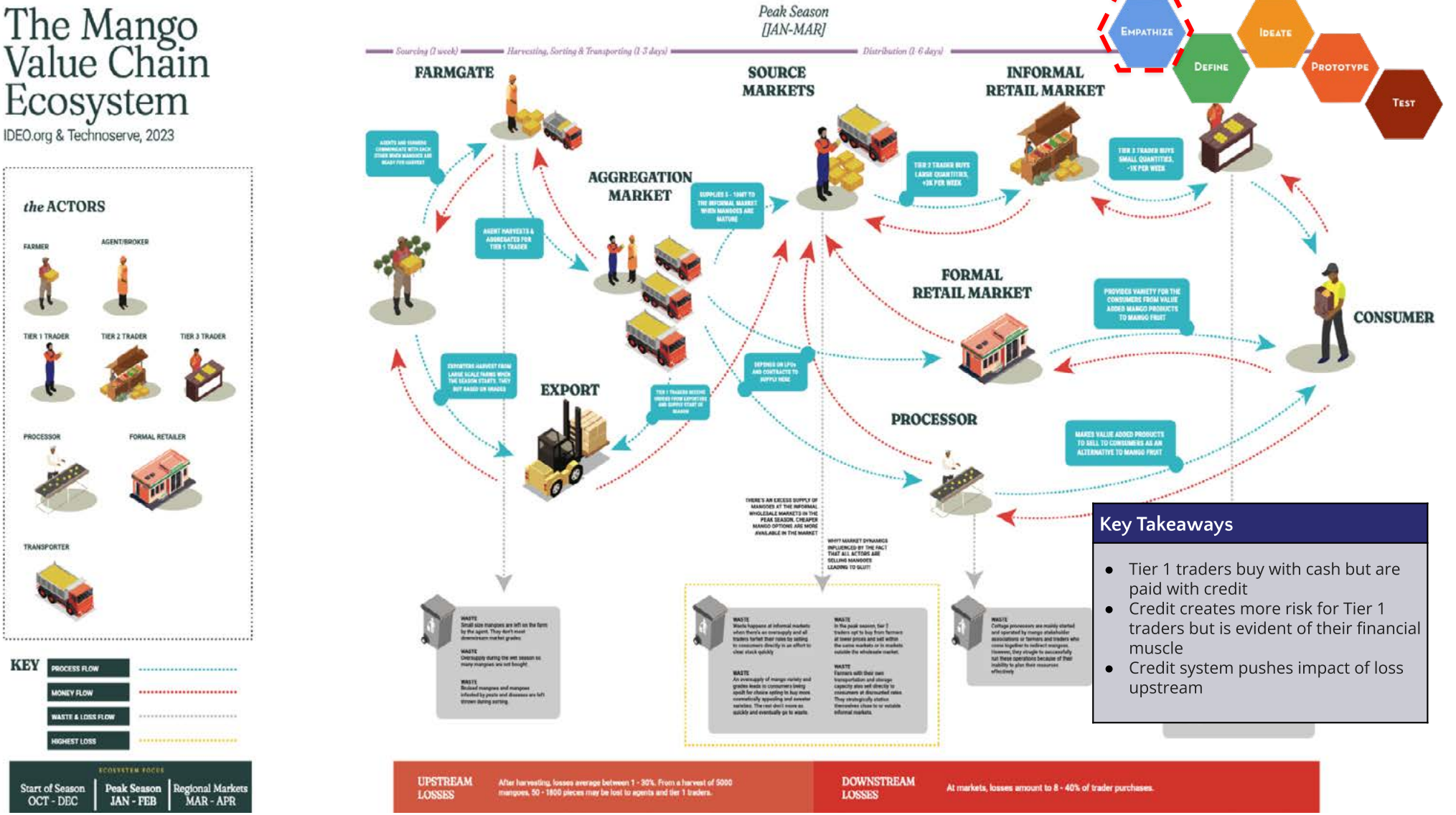
Filtering Framework using Desirability, Feasibility, Viability, and Impact Criteria

The NutriSave Program applied an equal 25% weight to each of these four criteria, underscoring that any solution needed to have consumer demand, be possible to create, be sustainable in the marketplace, and create the desired impact on FLW and access to nutritious foods for low-income consumers.

Desirability (25%)	Feasibility (25%)	Viability (25%)	Impact (25%)
• Does it solve for user pain points/needs? • How motivated are the actors/influencers involved to make this change? • Does this solution create behavior change?	• Are there high barriers: technical complexity, difficult partnerships, no existing channels for deployment, etc? • Does it seem possible to accomplish in the time and budget allocated for the project?	• Is there potential to make revenue sustainably? • Does it require recurring investment from NGOs? • Is there potential to scale the idea long-term?	• Does it increase access to affordable and nutritious F&Vs? • Does it improve nutritional outcomes for LICs? • Does it enhance women's involvement in this value chain? • Does it have a positive climate impact?

Example

Ecosystem Mapping of the Mango Value Chain



Key Takeaways

- Tier 1 traders buy with cash but are paid with credit
- Credit creates more risk for Tier 1 traders but is evident of their financial muscle
- Credit system pushes impact of loss upstream

Example

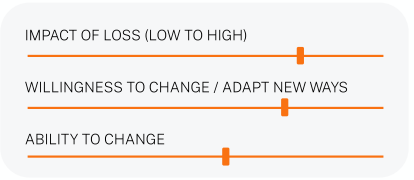
Personas Mapping in the Tomato Value Chain

THE SAVVY FARMER

MARY

The Savvy Farmer is a thorough, resourceful small-scale farmer in managing risks to bring successful harvests and maximum returns on investments.

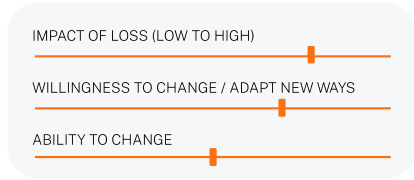
THE MARKET MAESTRO



GRACE

The Market Maestro is a tier 1 tomato trader who is a mobile, well-connected link in the tomato supply chain, adept at quickly picking and selling specific graders of tomatoes, monitoring the market and adjusting prices for maximum profits.

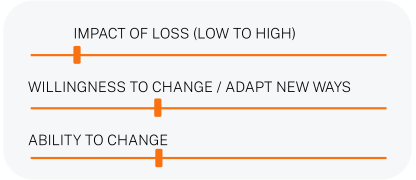
THE ADAPTIVE TRADER



EUNICE

The Adaptive Trader is a tier 2 tomato trader who is a savvy and adaptable business owner who utilises sorting, pricing strategies, and frequent customer communication to best efficiently sell their produce in bulk.

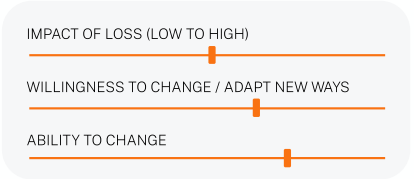
THE DYNAMIC VENDOR



JANE

The Dynamic Vendor is a tier 3 tomato trader. She is a small to medium sized seller who purchases tomatoes daily from a tier 2 supplier, She sells other fruits and vegetables alongside tomatoes to end consumers in small amounts

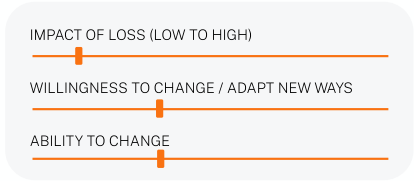
THE HIGH-YIELD FARMER



SAMUEL

The High-yield Farmer is a large-scale tomato farmer who is connected to his farming community, engages in block farming to continuously harvest in the high season. He uses his skill and know-how to remain resilient against market challenges.

THE TOMATO NEGOTIATOR



MAINA

The Tomato Negotiator is a broker who acts as a critical link in the tomato supply chain between upstream farmers and downstream traders, using their market intelligence and industry knowledge to facilitate profitable transactions

Example

65 NutriSave Solution Ideas as Summarized in Four Categories

Solution category	Solution ideas: Mango	Solution ideas: Tomato	Solution ideas: ILG	Prototype concepts: Mango	Prototype concepts: Tomato	Prototype concepts: ILG	Prototype concepts: Cross VC
Access to finance	1		1				
Access to markets / market linkages	5		3				✔ •Redirect to HoReCas •Platform to order
Improved technology	3	3	3				
Aggregation	2	1			✘ •Collection points		
Capacity strengthening	6	1	4				✘ •New microprocessors
Cold storage	1		1				
Consumer awareness	1	1					
Processed products	11	8	9	✔ •Low cost juice backpack •Small quantity packaging	✔ •Paste	✘ •Dried ✔ •ILG flour mix	
Total	30	14	21				

Example

Prototyping Results from NutriSave that Prioritized Piloting of 4 Concepts

TechnoServe completed multiple prototypes and will be moving forward with pilots of 4 concepts

	Concept	What would have to be true	Prototype Result
Moving to pilot	Redirect to businesses / Platform to order	Businesses are willing to buy redirected produce	✔ HoReCas are interested but logistics and pricing will be a challenge
		Project F&V match what the businesses sell	✔ On collected menus, tomato is most common, also sell ILG & mango juice
	Backpacks for juice*	Processors are willing to use backpacks	✔ When backpacks were offered to processors, the cited these barriers: cost & difficulty of importing, logistics of scale. Despite this there was interest. There are ways of avoiding import
		LIC communities will buy from backpacks	✔ Good sales with repeat customers. Customers responded well to juice & value prop
	Small cups of mango juice*	LIC are interested and willing to buy	✔ Sold very well at 25 KSH, with feedback on branding, taste, etc
	Tomato Paste	Processors are willing to use redirected tomatoes	✘ Processors and traders were connected and signed contracts but quality issues and shifting prices created difficulties
		LIC are interested in this product	✔ Favorite was pasta sauce, dried tomatoes disliked
		There's enough demand for it	✔ The duka associations model has evolved but there's some interest
	ILG Blend	There's enough demand for it	✔ Sales improved when informational poster was displayed
		LIC are interested in this product	✔ Porridge was well received by consumers in taste test
Downselected	New microprocessors	Traders are interested in becoming micro-processors	✘ Flyer received roughly 10% response rate (4 out of 36)
	Dried ILG	There's enough demand for it	✘ Processors were unwilling to provide samples. Product is too expensive for LIC.
		LIC are interested in this product	✘ In the taste test with consumers, Rehydrated was ok; otherwise poorly received
	Collection points	There's somewhere for the mangoes to go after they've been collected	✘ Processors aren't responsible for arranging transport
	Downstream processing	There's a way to avoid problems faced by existing downstream processors	✘ Need to prove business case to encourage new entrants - see juice

✔ Experiment succeeded ✘ Experiment failed

* Mango juice concepts will be combined into a single pilot

TechnoServe
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