Stories of Future Impact

Innovative Solutions to Reduce Post Harvest Loss in Africa

The Waste and Spoilage Innovators' Storybook

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GLOBAL KNOWLEDGE INITIATIVE

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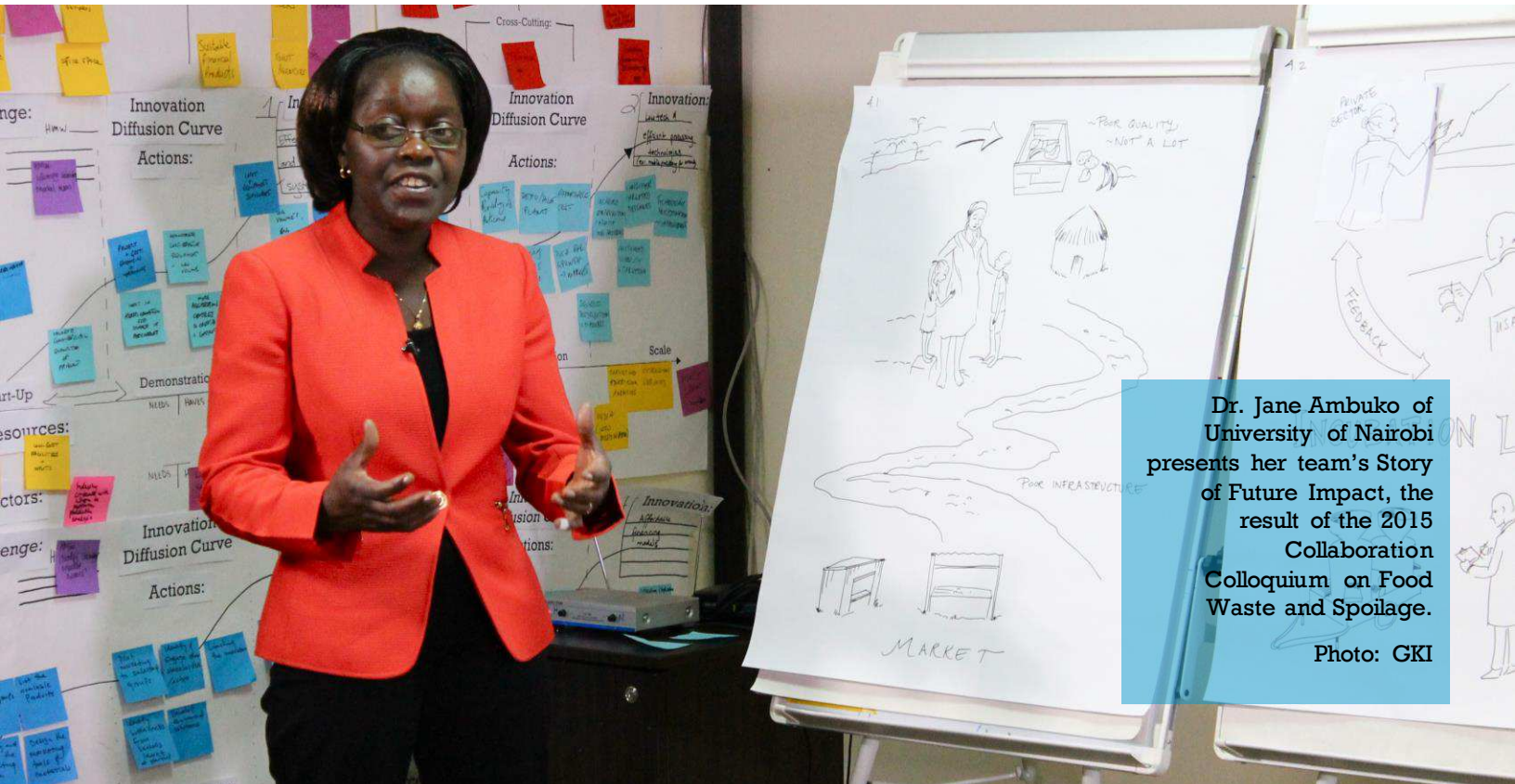


Dr. Jane Ambuko of University of Nairobi presents her team's Story of Future Impact, the result of the 2015 Collaboration Colloquium on Food Waste and Spoilage.

Photo: GKI

The Waste and Spoilage Innovators' Storybook

Background

Food loss—the loss of edible food at production, post harvest, processing, and distribution stages of the value chain—represents a significant challenge for developing countries. According to the World Resources Institute, approximately 23% of available food in Sub-Saharan Africa is lost or wasted (WRI 2013). Especially dire in developing countries, the burden of food loss is particularly high for smallholder farmers. Food loss reduces the income of approximately 470 million farmers and other value chain actors by as much as 15% (The Rockefeller Foundation 2013). A number of promising approaches to reducing food loss already exist, but issues related to access, affordability, adoption, and awareness of these practices and technologies inhibit their ability to render an impact at scale. Against this backdrop, The Rockefeller Foundation launched its *Food Waste and Spoilage initiative* in 2013. The initiative aims to identify integrated, innovative solutions to the food loss challenge—specifically challenges related to post harvest loss (PHL)—that have the potential for impact at scale.

Grappling with the integrated nature of the PHL challenge is an essential part of designing innovative solution sets positioned to deliver sustainable impact at scale. Without facing this reality head-on—and developing integrated, network-based approaches to problem solving—it will be difficult or impossible to deliver the desired economic, nutritional, and environmental benefits. Moreover, stakeholders may miss opportunities to identify linkages between existing resources and efforts to reduce PHL. For these reasons, the Global Knowledge Initiative (GKI), a not for profit organization with the mission to build problem solving networks that use science, technology, and innovation to deliver transformative solutions, took a series of steps to (1) develop innovative, vetted options for integrated solutions poised to significantly reduce food loss in Africa, and (2) create a vibrant network of stakeholders poised to take forward these solutions.

Steps taken as a Social Innovation Lab

Equal parts problem framing, strategic research, solution design, and innovation generator, the work performed by GKI is that of a Social Innovation Lab. The *Food Waste and Spoilage initiative,* like other Rockefeller Foundation initiatives, sought a Social Innovation Lab to orient design, decision making, and network formation toward innovation. Four activities comprised GKI's Social Innovation Lab approach. A first step included a 6-country-wide problem framing exercise in which more that 120 actors in the food value chain collectively mapped the many opportunities for and barriers to reducing PHL in Africa. Upon framing the problem, GKI's second step was to assess the resources available and needed to seize the top opportunities identified through problem framing sessions, producing 26 profiles of post harvest efforts taking place across Africa. International PHL stakeholders then met in Cape Town, South Africa to envision creative solutions for mitigating the challenge in light of high-priority opportunities and available resources. Building off of these steps, and representing the fourth and final step in GKI's efforts as a Social Innovation Lab on this challenge, the Collaboration Colloquium occurred in February 2015.

The Collaboration Colloquium

GKI designed the Food Waste and Spoilage Collaboration Colloquium to connect potential partners, mobilize available resources, and elaborate action plans aimed at delivering innovative solutions to the challenge of PHL in Sub-Saharan Africa. Recognizing the centrality of inclusive problem-solving networks to solving complex challenges like PHL, the Collaboration Colloquium aimed to spur these networks by bringing together actors from across sectors around shared PHL challenges. Hosted in Nairobi, Kenya on 3-4 February 2015, the Colloquium focused on perishables (fruit, vegetables, and staples such as cassava) because of their importance to diets and the high rates of spoilage within these value chains. The Collaboration Colloquium connected approximately 50 actors from academia, private sector, government, the donor community, and other sectors, as well as participants from the previous phases of the Social Innovation Lab's process (e.g., problem framing, etc.). Brought together for 1.5 days, these individuals formed six teams that built out suites of innovations with the potential for incredible impact on PHL across Sub-Saharan Africa, ultimately converting these ideas into the stories presented in this storybook.

Storytelling as an exploration of future impact

This Storybook represents a unique output of the Collaboration Colloquium. Throughout the Colloquium, six multi-sectoral teams ideated and honed analytic bundles of potential innovations around PHL challenges (find information on these integrated innovations in the Collaboration Colloquium After Action Report, a companion document to this Storybook (*link to be added)).* Once they had devised potential innovations that they believed could be catalytic in solving PHL challenges, GKI guided participants to go a step further, and think about their potential impact on the level of a specific actor, such as a farmer, processor, buyer, or network convener. Their methods for imagining future impact: storyboarding and storytelling.

What is Storyboarding?

Storyboarding is a simple, yet powerful storytelling technique that visually represents how a user interacts with a system to achieve a goal. It does this by integrating disparate elements of a story—characters, challenges, environment—through a narrative sequence of drawings or pictures. Originally popularized in film production, storyboarding has become an important process for innovators, entrepreneurs, designers, and other professionals in media, technology, marketing, and the service sector. Easy to use and adaptable, storyboards serve a number of purposes. They can act as a modeling tool to analyze existing scenarios and user experiences; a communication tool to explain how a technology or innovation influences a user's behavior; or as a creative tool to brainstorm and visualize solutions. Storyboarding, in essence, uses key elements of storytelling to organize ideas, communicate, and ideate

Storyboards represent an opportunity to take a plan of action and explore it from the perspective of a single user or beneficiary (see right for an overview of Storyboarding). The six multi-sectoral teams worked with professional illustrator Chamisa Kellogg to first ideate and then artistically render their hoped-for impact as it would be experienced by a focal person. Teams also wrote out verbal narratives, with help from GKI coaches. On the Collaboration Colloquium's second day, once their storyboards were complete and they felt confident in their inspirational narratives, teams presented these stories to the full group, with their storyboards behind them as a guide. After teams presented their stories to the full group, Colloquium participants filled out specially designed evaluation forms in which they rated the ideas presented, provided feedback and questions, and made offers of resources and partners.

Illustrator Chamisa Kellogg (bottom left) works with a team to finalize their Storyboards.
Photo: GKI

These stories provide a thoughtful and human-centered look into the challenges, innovations, resources, actors, and activities needed to reach impact; evaluations gave participants a chance to analyze, critique, and recommend improvements to these suggested elements. Beyond providing a deep portrayal of the impact possible through integrated PHL solutions, these stories also took what could be seen as the fodder of experts—research and analysis—and made it viscerally: post harvest solutions were not simply a way to reduce PHL statistics, they could radically transform the lives of millions of families throughout Sub-Saharan Africa. The following page offers an overview of the steps that groups took to tell their Stories of Future Impact, followed by a description of the content included in this document.

How did we use Storyboarding? *Facilitated Storyboarding in 6 Steps*

(1) **Six-Panel Template for Storyboarding**: Using a template provided by GKI, participants developed 6-panel storyboards. These panels highlighted the key elements of their storyboards: The Challenge, The Innovations, The Resources, Partner/Actions, Intermediate Achievement, and The Ideal Future.
(2) **Hands-On Instruction:** GKI facilitators moved from group to group, offering guidance and support to ensure that the stories flowed and highlighted the innovative aspects of the narrative.
(3) **Storytelling Coaching Session:** Each group sent their chosen Narrator to a coaching session, where storytellers received guidance on voice, flow, and other narrative devices.
(4) **Guided Prompts:** To ensure ideas were clearly conveyed, prompts, such as: "Beyond what's visualized in the illustrations, what other information can you imagine sharing about this idea to offer a sense of impact?" and "How would a listener to this story gauge the degree to which the innovations you've conceptualized are desirable / feasible / viable?" guided teams. These prompts pushed teams to make assumptions explicit and ensure their narrative conveyed critical messages for a listening audience.
(5) **Time with the Artist:** After illustrating each group's six storyboard panels, illustrator Chamisa Kellogg worked with each team to make any necessary adjustments or additions to the drawings such that they accurately supported the verbal narration.
(6) **Filmed Story Delivery with Evaluations:** The appointed Narrator from each group presented the team's story with the teams large-format illustrations, drawn by Chamisa. Following the presentation, an expert panel and audience members posed challenging questions regarding the story's ability to achieve impact. Finally, audience members completed an evaluation form, ranking each story on a number of factors such as feasibility, desirability, viability, and innovativeness.

Overview of the Food Waste and Spoilage Innovators' Storybook

This document is designed to provide an intellectually and visually stimulating look at the Stories of Future Impact told at the Collaboration Colloquium. The Storybook includes Chamisa Kellogg's illustrations and stories developed and told by teams during the Colloquium. The Social Innovation Lab honed the stories to assure they included relevant content that these groups developed in other parts of the Colloquium while attempting to maintain the personality and warmth exuded during their telling.

We begin each story with an overview of insights, potential impact, and innovations that stem from the story. Following this overview are the six panels of each team's storyboard, including photos of Chamisa's drawings, and text telling the story. Each story ends with an evaluation page, which includes aggregated participant feedback on each story. Included in the evaluation pages is the feedback provided by respondents, as well as offers of resources and potential partners. For a full list of offers at the level of each participant, see the Collaboration Colloquium After Action Report.

We hope that you will enjoy, and find enlightening, this uncommon portrayal of what is unfortunately a very common problem in Sub-Saharan Africa. It is our hope that the life-changing post harvest loss improvements and impacts portrayed in these stories can come to fruition through ambitious and innovative partnerships between the individuals present at the Collaboration Colloquium, and many, many others across Sub-Saharan Africa.

GKI's Sara Farley (left), AGRA's Anne Mbaabu (center), and The Rockefeller Foundation's Olivia Karanja (right) ask tough questions of storytellers.

Photo: GKI

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

Linda's Legacy:

Unlocking Local Markets

Insights

This story is one of transforming local markets to meet local needs so that African families can access the food they work so hard to produce. With a 1.5 billion dollar industry for local produce in Kenya, farmers have an opportunity to begin sourcing to local markets rather than depending strictly on unreliable export markets. By training farmers to use proper post harvest tools and technologies, equipping them to aggregate produce at collection centers, and using optimized transport systems to minimize costs and sell directly to buyers, farmers can fetch higher prices due to reduced losses and higher quality.

- Contract farming models are usually used for export, but should be used to tap into local markets as well so farmers can depend on the profits that come from agreements to sell a certain amount, of a certain quality, at a certain time.
- Innovative transportation models, such as those used by Coca-Cola, in which low-petrol vehicles map efficient pick-up routes, ensure produce reaches its destination cheaply and without damage.
- NGO and government partners are crucial for farmer training on post harvest loss reduction technologies and methods that are necessary for storing produce such that it can be aggregated at collection centers and sold in bulk to buyers.
- Simple technologies such as plastic crates can go a long way to reduce post harvest loss by allowing smallholders to safely transport perishable goods without damage caused by poor handling.

Impact

Taken to scale, the future in this story is one with fair and consistent buyers of local produce for local consumers. In turn, those buyers are willing to make long-term investments in the technologies and farmer training needed to keep post harvest losses at a minimum. After receiving proper training, the farmers know how to correctly handle and transport their produce, so not only do their post harvest losses decrease, but their yields increase as well. With increased formalization of markets through information and communication technology, contract farming, and well-mapped transportation routes, farmers benefit from reliable, higher wages and can further invest in the technologies to maintain their high-quality and high-yield production. Ultimately, this future of enhanced productivity means that farmers reap higher profits per acre than they used to, buyers benefit from larger sales of high quality goods, and the consumers enjoy produce at a potentially lower cost; in sum, they all 'win.'

Innovations

To bring smallholder farmers up to speed on the tools and technologies they need to reduce post harvest loss, they need to understand the business case and receive proper training. Innovative technologies for reducing post harvest loss do not need to be complex or highly technical. Scaling the use of plastic crates, for example, can reduce post harvest loss to as little as 1.5%. Key to the innovative nature of this story is the emphasis on exposing farmers to critical technologies, such as crates and cold storage units. This story highlights an innovative pooled-services mechanism, through which the private sector invests in the training and technologies needed to reduce post harvest losses so that those companies can benefit from sourcing reliable, high quality, high quantity produce. The notion of shared transport to collection centers using low-petrol vehicles called tuk tuks, is one of the major drivers achieving high quality/quantity produce. These vehicles can minimize the inefficiencies of time, petrol, and excluded farmers by mapping out routes that combine collection center pick-up and intermediate collection points, developed to optimize distribution. Reliable transport means it is less risky for buyers to engage in contract farming with smallholders. While contract farming is usually used for exporting produce (to Europe, for example), this story highlights the benefits of using contracts for local buyers and retailers.

Storytelling Team

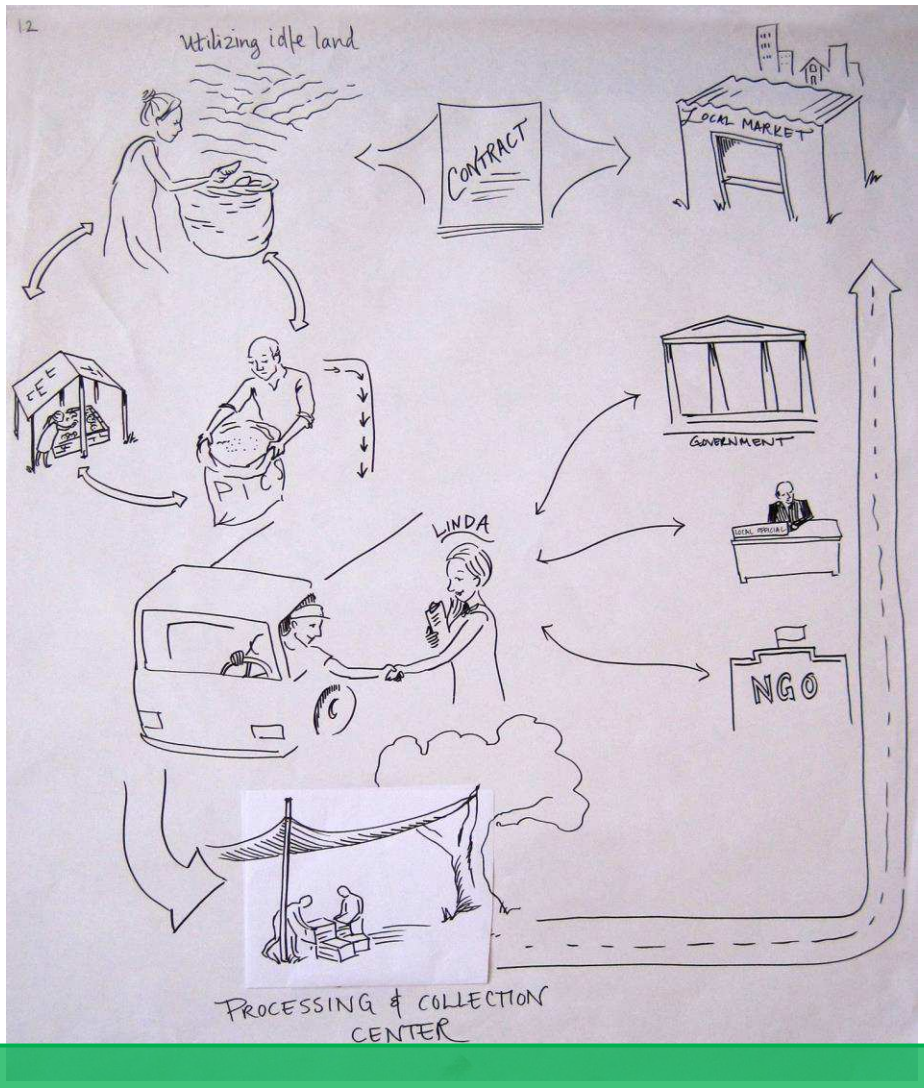
Narrator: Alan Boswell, Twiga Fruits

Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Amira Bliss, The Rockefeller Foundation; Justin Mabeya, USAID Kenya Feed the Future Innovation Engine; Pauline Mugendi, USAID Feed the Future Innovation Engine; Esther Muiruri, Equity Bank; Judith Oduol, World AgroForestry Center

The Challenge

This is the story of Linda, a Kenyan woman who worked for an export company that shipped goods like coffee, tea, and French beans to markets around the world. From an outsider's perspective, Linda had a very successful career sourcing goods to international export markets, but she couldn't help but notice two troubling things: (1) it was becoming increasingly difficult for her smallholder farmers to compete in the export market; and (2) like many Kenyans, she found her food costs continually rising. As it became more and more difficult to put food on the table for her daughters, Linda decided to conduct research with the hopes of determining why her food costs kept rising. She found that Kenyans were spending an enormous 55% of their money on food, 93% of which was being sold in local stalls and street kiosks, rather than in supermarkets. Export companies and buyers such as her company focused heavily on efficiently sourcing high quality products for the export market, but they failed to effectively source from smallholder farmers, did not increase the availability of produce in the local market, and incurred high rates of post harvest loss because their export standards were substantially more stringent than what was necessary for the local market, making it difficult for farmers to maintain those standards.

It became clear to Linda that there was a huge unmet need for locally sourced, affordable produce for people living in Kenya. With the hope of tapping into and expanding that market, Linda decided to hire a broker to source produce for her. The broker would buy produce, like bananas, from a number of smallholder farmers, and then sell the food to Linda at a slight premium, so she could then sell to larger buyers. While this seemed like an efficient way to get produce from a variety of locations and individuals, Linda was still unable to make a profit because by the time the produce reached her, much of it was damaged and thus could not be sold. Linda lay awake at night puzzling over her dilemma, trying to think of some way to get produce to market without suffering crippling levels of post harvest loss so that she could make enough money to support her family. But what could she possibly do?



The Innovations

When Linda woke up the next morning, she knew it was time for a change. She thought about her days working in the export industry and sourcing produce from contract farmers and thought to herself, "Why can't I do that now, but focus on the domestic market?" So Linda paid a visit to those contract farmers with whom she used to work and asked if they could grow produce for local buyers instead of export markets. "What's in it for us?" asked the contract farmers. Linda explained that a farmer might get higher prices selling to local buyers than selling to exporters because of the unmet local demand for food crops. Linda began working with medium-scale and smallholder farmers to aggregate produce at collection centers so that they could amass enough produce to be sold in bulk to local buyers.

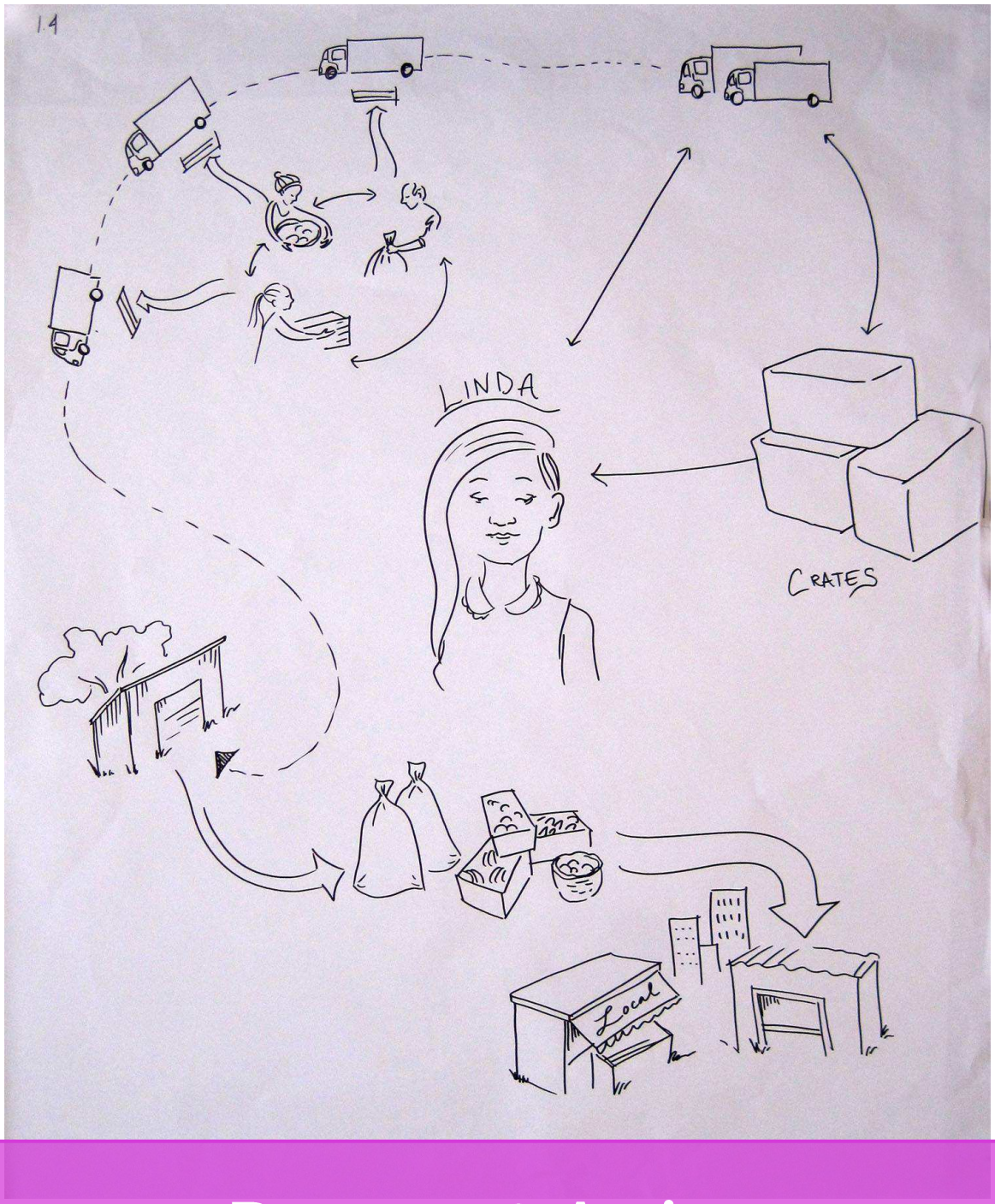
Linda realized that even though she successfully got famers to bring their produce to the collection centers, they were still dealing with high levels of post harvest loss. The problem was the farmers did not have the training, tools, or services for proper post harvest handling and transportation of their produce. To remedy the situation, Linda first provided the farmers with plastic crates for carrying produce. Rather than using raffia baskets, which are not durable and allow damage from insects, moisture, and physical trauma, using plastic crates can reduce post harvest loss substantially. Once they had aggregated their produce at the collection centers, farmers needed training on how to use other post harvest tools and technologies to maintain quality, so Linda leveraged her contacts to elicit support from NGOs that conducted farmer trainings.

More importantly, Linda introduced the idea of shared transport. For a while, Linda struggled with the cost of transport because large vehicles require a lot of expensive petrol. One day, as she was sitting and drinking a bottle of Coca-Cola, she had a brilliant idea. Why couldn't she bring Coca-Cola's level of efficiency to her transportation and delivery model? First, she would need to figure out how to efficiently source the produce from smallholder farmers. Then, she hoped to directly borrow from Coca-Cola's model for distribution, using small tuk tuks, vehicles that use little petrol and have the ability to transport 40 crates of produce at a time. Using a network of tuk tuks and mapping strategic distribution routes, she was hopeful that the levels of post harvest loss would start to decrease. Thus, through aggregation and shortened supply chains, the numerous actors along the supply chain would able to receive better prices for their food products.

Resources

After meeting a number of NGOs and government extension officers who work with farmers, Linda helped launch a system of trainings for her source farmers. The trainings described the tools and techniques for a number of different post harvest technologies (ranging from plastic crates to cold storage units) to ensure proper uptake. Working with technology suppliers to ensure the farmers could obtain those technologies was key. Once trained, farmers were able to consistently and effectively use those technologies at the collection centers, so their produce did not suffer high levels of post harvest loss. The idea of providing pooled services, like technology training, at collection centers was a worthwhile investment because reducing that post harvest loss drastically increased the incomes of all farmers involved, as well as Linda's income. You see, without investing in the technologies and training to decrease post harvest loss, Linda's business model would not hold up. Explaining this business case to the farmers (trainees) increased the level of buy-in and interest in attending the trainings.

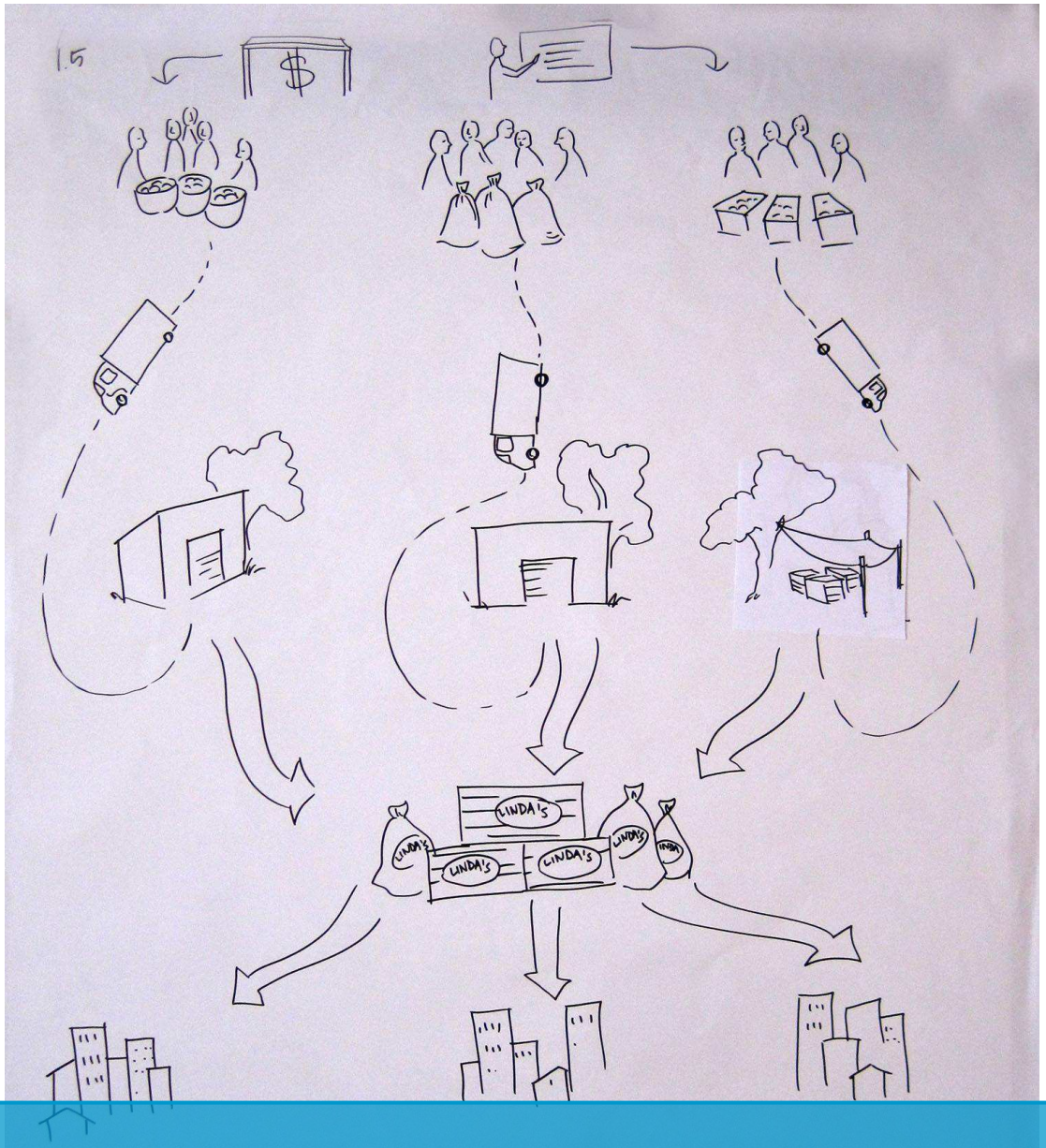
Beyond post harvest technologies, Linda also helped equip the farmers at the collection center with the mobile technology needed to properly communicate and schedule produce transport. If Linda's efficient transport system was going to work, she would need to be able to coordinate very closely and quickly with the farmers. When transporting perishable produce, every minute mattered.



Partners & Actions

The new transport system was critical to making Linda's entire business model work. The smallholder farmers she worked with used to rely on brokers to pick up the produce from the farm. However, because those brokers were unreliable, the farmers had no real control over when they could offload their crops. For instance, if the broker arrived a few days later than expected, the large majority of the harvested crops would be spoiled and not suitable for sale. Under the new system, though, the farmers were happy that they could work together and exert a greater amount of control over the sale of their produce. Using mobile phone technology, they communicated and coordinated among themselves to determine the best time to gather all of their produce and jointly transport it to the collection center for storage and/or processing.

After those farmers transported their produce to the collection center, Linda would use her efficient transportation model to take the food from the collection center to what grew to be a large warehouse in Nairobi. Once the produce was in one place, she would coordinate with various Nairobi kiosks and other market outlets to determine the fastest delivery routes.

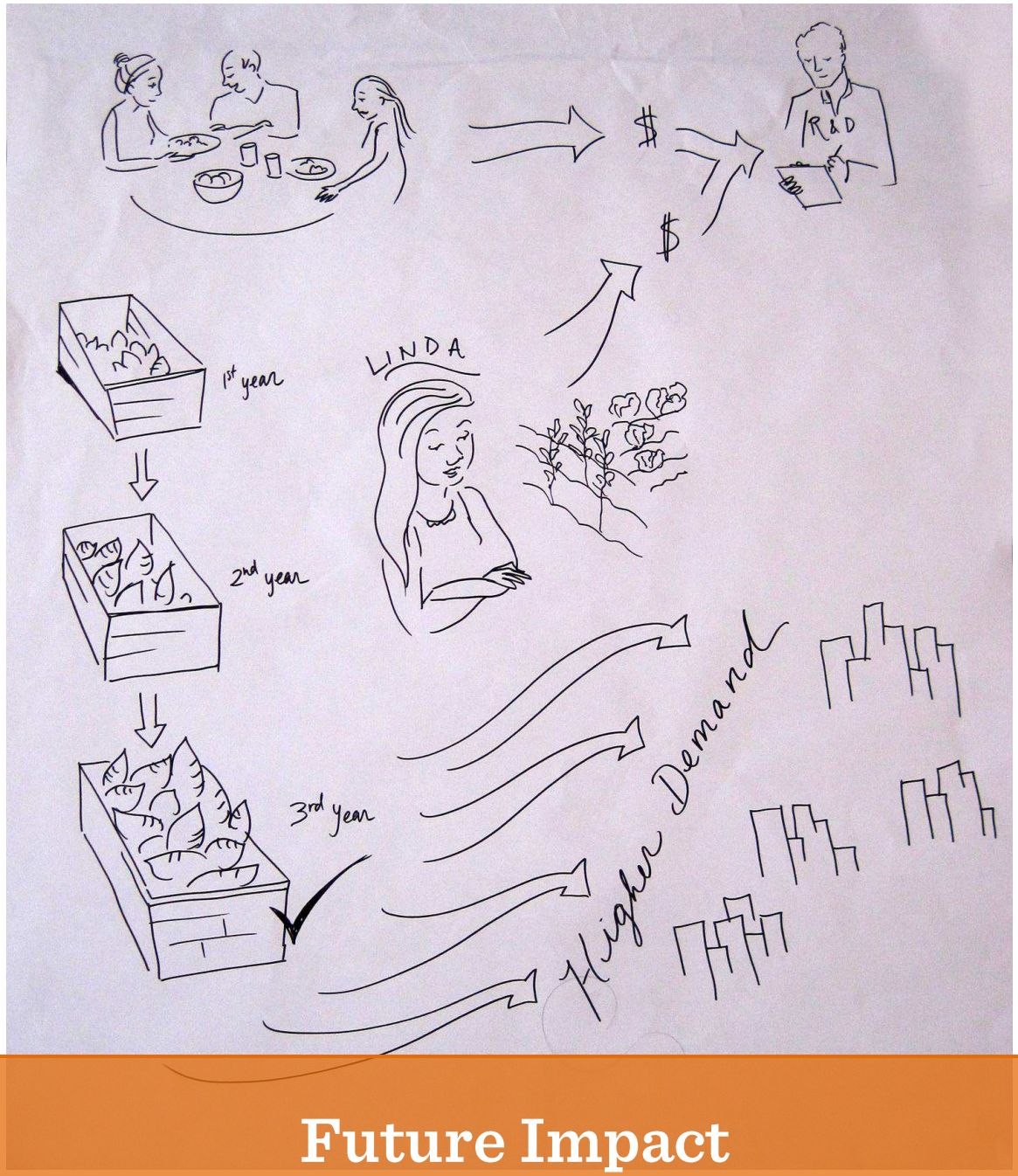


Intermediate Achievement

As post harvest losses were slowly decreasing, Linda had increasing quantities of produce to sell. She thought to herself, "How can I possibly offload all of this food?" She quickly realized that to build a well known, trusted, successful produce company, she would have to develop and market a brand of her own. She decided to name her company LINDA's: By Kenyans, For Kenyans. Slowly but surely, Linda started to see her name printed on produce containers from kiosk to kiosk. But why stop there? Linda realized she could sell even more food products if she used the collection centers not only to amass and store perishable goods, but also to process food products. For instance, she used mobile processing units to turn the staple crop cassava into a type of mash called gari.

As Linda's business grew, her efficient distribution model that relied on low-cost, low-petrol vehicles and streamlined routes was starting to be adopted in other value chains as well. But it wasn't just buyers like Linda who were seeing success. Smallholder farmers were benefitting as well. Because contract farming was being used for local markets and not just for export, the farmers no longer had to worry about regulatory issues, raising tariffs, and global price fluctuations. As long as they could use post harvest loss tools and technologies to maintain quality, they were able to sell to local buyers. Ongoing farmer trainings ensured the farmers were well informed and equipped to properly store, preserve, and transport their produce.

Because the local markets had a slightly higher predictability than the export markets, farmers were able to plan and make long-term decisions, such as increasing their yields to meet the buyers' needs, as stipulated in contracts that told farmers exactly when they would sell goods to which buyer, at what quantity, for what price. This kind of reliable and consistent income generation allowed the farmers to further invest in post harvest loss reducing technologies.



Future Impact

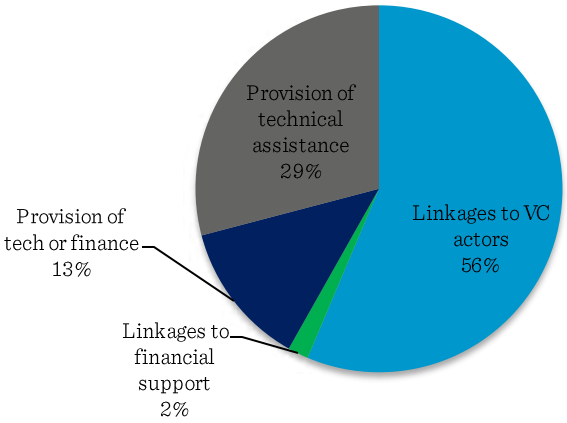
Based on the increased farmer production of quality produce and the implementation of an efficient transport system, Linda began amassing enough profit to start thinking about further expansion of her company. Although she used to only focus on one or two commodities, she decided to set a new goal of sourcing the 20 most commonly consumed food items on the Kenyan plate.

Linda's big dreams of expansion suddenly seemed like a real possibility. By bringing additional commodities into her collection centers, she hoped to transform LINDA'S into the go-to brand for each Kenyan household's basic food needs. What was once a very fragmented food market in Kenya was starting to become consolidated and formalized in a way that benefitted both the sellers and the buyers, and allowed individuals from small towns to large cities to access the same, high-quality food. While the brand name LINDA's was now being seen across Nairobi kiosks, Linda saw a future in which her produce stocked the shelves in Mombasa and Kisumu as well, slowly becoming a household name in the food industry.

Farmers lined up to work with Linda because the benefits were clear. After receiving proper training, the farmers knew how to correctly handle and transport their produce, so not only were their post harvest losses decreasing, but their yields were increasing as well. Ultimately, this increased productivity meant that farmers were making a much higher profit per acre than they did before. Linda felt hopeful as she pondered a future in which more Kenyans could enjoy similar transformations.

Evaluation: Perspectives from CC participants on Stories of Future Impact

60 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group 60 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Access to farmers' groups
- Buyers/processors

Linkages to finance:
- Link to credit

Provision of tech or finance:
- Cold storage
- Finance for smallholders

Provision of technical assistance:
- Creation of business models

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. Of the six Stories of Future Impact constructed at the Collaboration Coloquium, this has the smallest variation between scores. Though participants rated this idea slightly lower in viability than in the other three characteristics, compared to other Stories this one received solidly positive ratings. High feasibility and desirability scores speak to a bundle of innovations with the capacity to realistically effect change; however, the lower score on viability reflects participant comments suggesting potential challenges in organizing financing for this scheme.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? 3.84 out of 5 (25 respondents)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? 3.88 out of 5 (25 respondents)
Viability: Is this innovation likely to be financially viable given market supply and demand? 3.56 out of 5 (25 respondents)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? 3.72 out of 5 (25 respondents)

Strengths

Respondents observed the following strengths in this idea:
Could benefit many farmers; Market-led; strong linkages; could reach economies of scale; could stimulate local demand; opportunity for multi-seasonal/year round activities; produces innovations in transport; reducing produce damage increases price/quality

Concerns

Respondents voiced the following concerns about this idea:
Scalability; viability in competitive market; actual benefit to/focus on farmers; management organization; focuses more on markets than PHL; extension to farmers may pose a challenge; price instability; requires substantial investment; unclear ownership of technology

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
Flexible and available financing options; favorable policies; trust between buyers/farmers; markets are stable/predictable; sufficient liquidity to handle late payments; availability of storage; strong management

Questions

Respondents asked the following questions, which they believe are important to moving this idea forward:
How do we set the prices? Who will manage the collection centers? What system is in place to enforce this innovation? How will it benefit smallholder farmers? How will financing be availed? How will technology changes affect this innovation? How would we deal with oversupply?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Figure out where/how/with whom to scale; involve service providers/private sector; ensure farmers benefit; work with local government; study market requirements; identify financing for FBOs; enhance transparency in price setting/information sharing on prices; outsource collection

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

Wanjiku's Transformation

From Price Taker to Price Setter

Insights

If given the right policy support and business case analysis to encourage investment, private-sector companies can increase the production and distribution of post harvest technologies for smallholder farmers. Those investments lead to decreased losses and increased incomes for farmers.

- Government policy support for investment in post harvest technologies can come in many forms, such as pull mechanisms, tax exemption, or affordable loan programs in partnership with local banks. Pull mechanisms may be most effective because they provide a direct, positive financial reward for adjusting technology supply to meet farmer demand.
- Multi-sector platforms can increase dialogue among government, private sector, NGOs, researchers, and farmers, all with the aim of increasing investment in and adoption of post harvest technologies. Using a combination of online and in-person fora would ensure streamlined and consistent communication between those actors.
- Scientific testing of technologies in incubation labs can lead to the development of innovations with higher probability of adoption, but they must be supported by farmer training to assure uptake. Moreover, launching the lab would depend on funding from government policies to support further investment in technologies that can reduce post harvest loss and increase incomes for smallholder farmers.

Impact

A focus on increasing private sector investment in producing and distributing post harvest technologies can benefit those participating companies with increased sales through a new target market while also benefitting the smallholder farmers. Increased access to post harvest technologies allows farmers to either store or process their crops to maintain higher qualities for longer periods of time, thus increasing their ability to sell to large buyers. By selling a higher quantity and quality of food, the farmers receive higher wages, which allows for further investment in their farming businesses and improved livelihoods for their families.

Innovations

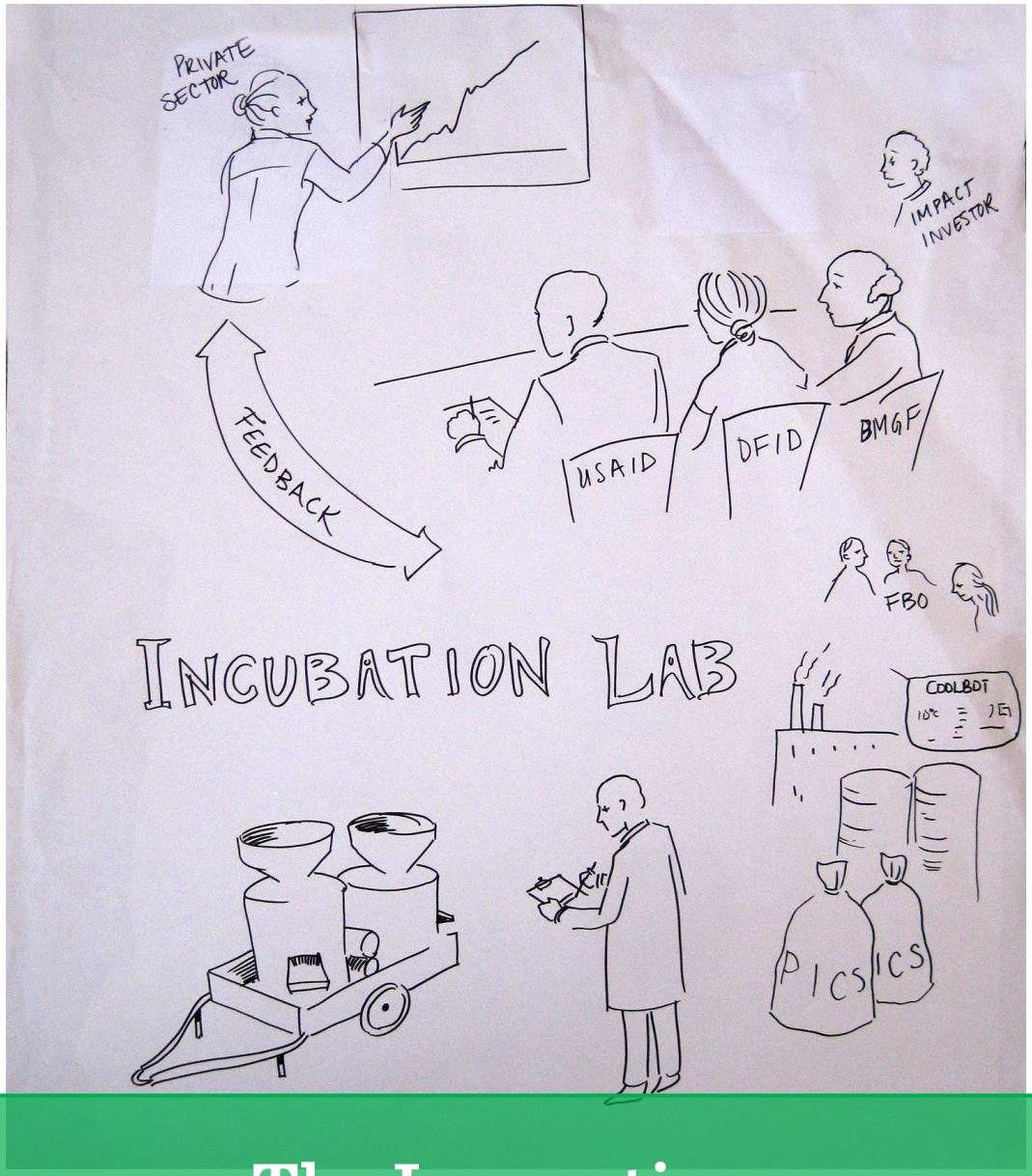
For smallholder farmers to have the post harvest technologies they need to reduce losses and increase market access, private sector investment in producing and distributing those technologies is vital. Innovative government policies that provide the private sector and other key innovation actors with financial and other incentives to develop, test, and commercialize is key to the success of this story. Additionally, online and in-person platforms can facilitate cross-sector discussions that promote the business case for those investments, fueled by stronger linkages between innovation system actors. To help support the business case and the investment analysis, researchers work in incubation labs testing, tweaking, and reporting on the capabilities of newly developed technologies. Importantly, this story reveals awareness of the need to co-create with the ultimate users of technologies such that resulting post harvest innovations are desirable and relevant to their needs and contexts.

Storytelling Team

Narrator: Jane Ambuko, University of Nairobi
Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Sabdiyo Dido, SNV Kenya; Michael Elliott, TechnoServe; Anne Mbaabu Alliance for a Green Revolution in Africa (AGRA); Elizabeth Wakahe, Kenyatta University

The Challenge

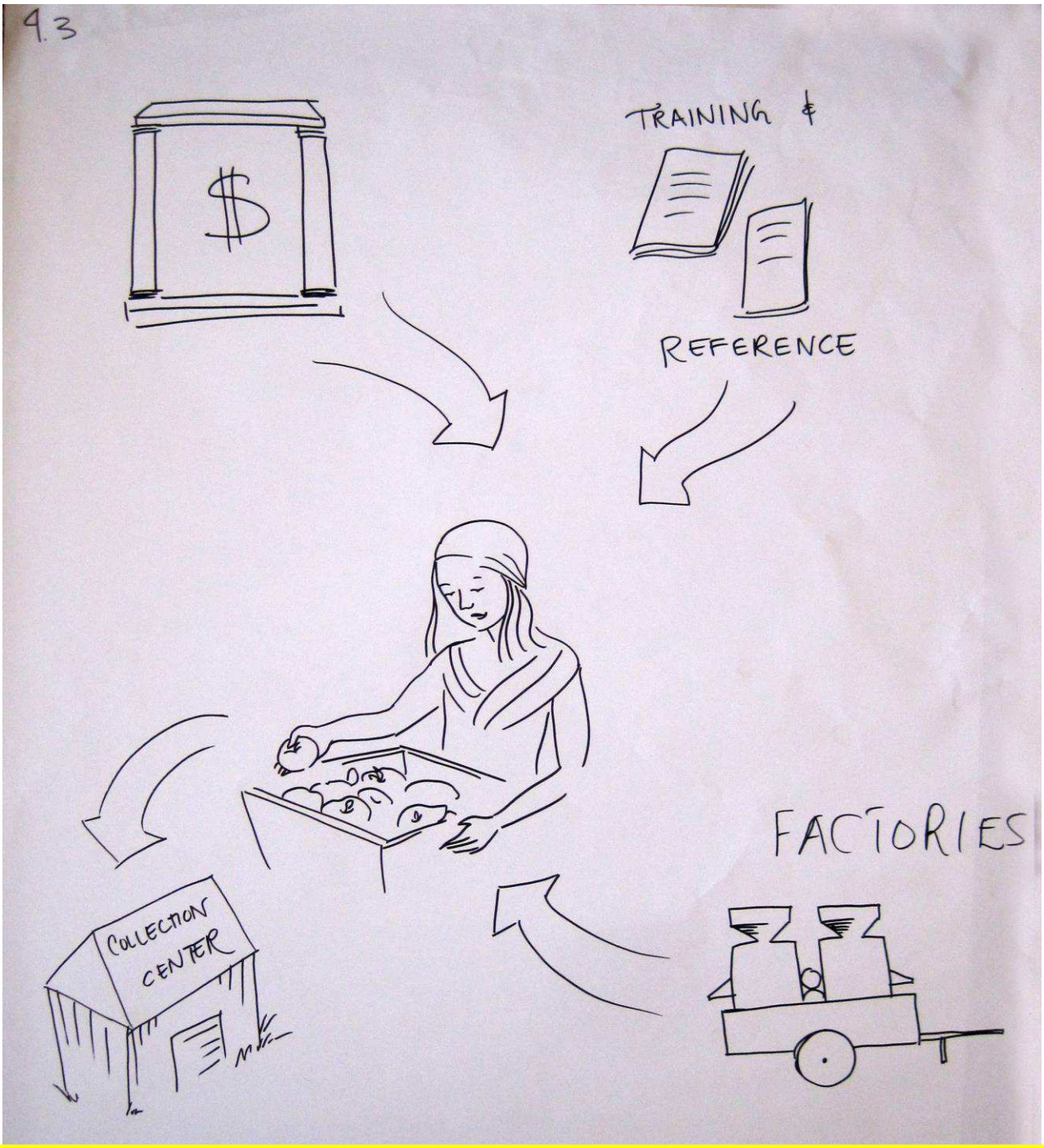
Wanjiku, a smallholder farmer living in Kenya, struggled daily trying to sell her crops. To start, Wanjiku didn't know which variety of crops to grow for sale at market. But even if she had known what varieties to grow, she didn't know which inputs and technologies would be required to ensure her produce was of high enough quality to obtain a price at the market that would justify her effort. Sadly, Wanjiku did not even have that opportunity; she lost both crops and money when her produce went bad while waiting to be transported to market. Wanjiku felt lost. If she was going to move beyond just producing enough for her family to eat, she would have to find a way to store the remaining produce and preserve the quality until she was able to sell it at market. Wanjiku hoped that one day her farming would be transformed, and she would have the ability to grow enough high quality produce to sell at the market.



The Innovations

Many of the technologies that Wanjiku needed to achieve her goals were already available. The problem was that Wanjiku either did not know about the technologies, or could not access them. For example, she could use PICS (Purdue Improved Crop Storage) triple-layer hermetic storage bags to prevent her grains from suffering pest infestation or toxin contamination. For her perishable fruits and vegetables, Wanjiku could use the CoolBot that works with an air conditioning unit to bring temperatures down to 35 degrees Fahrenheit, allowing produce to be stored for longer periods of time until it sold to a buyer. She could also use value addition technologies such as mobile processing units to increase shelf life and bring processing close to farm. What's more, there were other technologies and modifications of technologies that were not yet available on the market, but which could transform her farm through better processing, preservation, and storage.

Accessing transformative post harvest technologies meant Wanjiku first needed the private sector to invest in developing and distributing those technologies. Recognizing the challenge faced by farmers like Wanjiku, development organizations had begun building innovative platforms, both online and in-person, to facilitate communication between private sector actors, public sector actors, farmer groups, and scientists to make the business case for investing in post harvest technologies. The government was also working with scientists to develop incubation labs to serve as a place to test and refine new post harvest technologies. Meanwhile, because a number of private sector companies were still not incentivized to risk investment in supporting smallholder farmers, the Kenyan government decided to intervene by developing private-sector friendly policies and pull mechanisms that provided financial rewards to private sector companies for meeting the market demands of smallholder farmers.

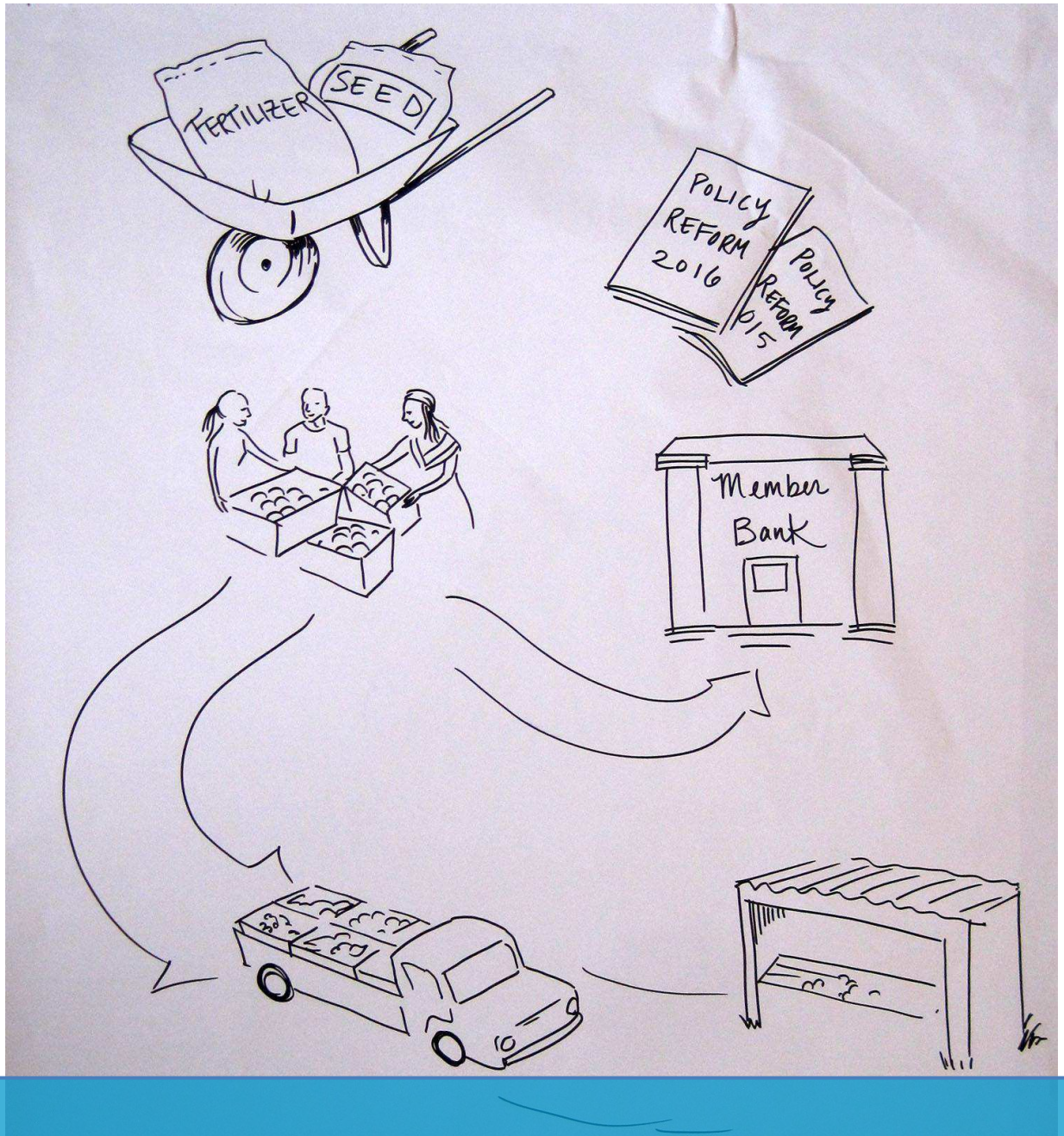


Resources

Through increased government and private sector support, Wanjiku and other smallholders finally had access to near-farm processing machines, factories, and other post harvest technologies. To access those technologies, Wanjiku and the other farmers jointly invested in the technologies, which they used on their aggregated produce at the collection center. Wanjiku was excited thinking about these technologies that would allow her farmer group to almost immediately process their food products such that they would have a longer shelf life and would not spoil before they were sold to large private-sector buyers. But now that the farmers had access to the necessary storage and processing technologies with support from government financing programs, Wanjiku realized it would be crucial that they receive training on how to properly use those technologies and how to implement good handling practices for food crops.

Partners & Actions

Government extension officers were key to increasing awareness about post harvest technologies and their importance for allowing smallholder farmers and farmer groups to amass enough high quality produce to sell to large private-sector buyers. For many farmers in Wanjiku's village, merely hearing about the technologies was not enough to convince them to invest in a new way of handling, storing, and processing their produce. If the technologies could have that big of an effect on their produce, the farmers wanted to see the results for themselves. Therefore, the researchers who worked in the incubation lab partnered with extension officers to provide demonstrations of numerous post harvest technologies. Wanjiku saw what a difference this made: the farmers in her village realized how these technologies could drastically improve the quality of their crops, enabling them to sell at market. But getting farmer buy-in wasn't enough. To convince the private sector to invest in these technologies, local NGOs developed an advocacy plan to lobby the government for new policies supporting this private-sector investment, for example through pull-mechanisms that serve as a type of financial reward for meeting the smallholder farmers' technology needs.



Intermediate Achievement

Just months before, Wanjiku hadn't even heard of these post harvest loss reducing technologies. But now these innovations had already started to transform her crops, her farm, and her family. As a result of the extension officer trainings and demonstrations, she knew about the proper inputs (e.g., seeds, fertilizers, etc.) and technologies to transform her farm from one that suffered a high percentage of post harvest loss to one that thrived on preserved and processed produce sold to buyers. With increased government investment in infrastructure development, Wanjiku rarely worried about her produce actually reaching the consumers' plates.

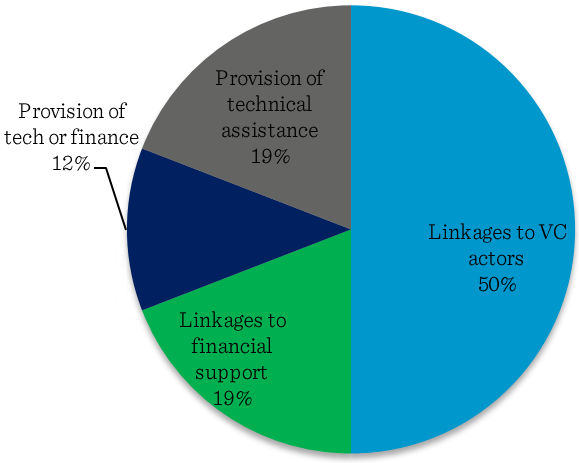
With respect to government investments, the local NGOs worked together to launch a movement to support private-sector-friendly policy reform. The government had already started developing pull-mechanisms to lower the risk of investing in the production of post harvest technologies. Additionally, the government was discussing the possibility of implementing a zero-tax system on imported post harvest loss reducing technologies, such that private sector companies could avoid paying a large premium to bring needed technology into Kenya. Because smallholders had limited access to financing to jointly purchase the post harvest technologies they required, the government also partnered with banks to provide affordable loans geared at smallholder farmers like Wanjiku.

Future Impact

Wanjiku shook her head as she thought about the times when she could barely feed herself or her children and when she struggled to afford to take her children to school. She had already come a long way from that point, but she couldn't help but be excited about a future in which she would be fully in charge of her farming business. Wanjiku had already benefitted from increased incomes: she was meeting her family's nutritional needs and was even saving some money. She knew it wouldn't be long before she would be able to spend her evenings sitting and relaxing with her family, watching TV like so many others did. She saw a future in which she would have the money to harvest water and increase the value of her agricultural production by investing in post harvest storage, processing, handling, and preservation technologies. She saw a future in which she could store her produce and sell it when it was not in season for a higher price. Her vision was a future in which her life was transformed. And she was already well on her way.

Evaluation: Perspectives from CC participants on Stories of Future Impact

68 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group a whopping 68 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Distribution channels
- Access to clients

Linkages to finance:
- Linkages to micro-finance institutions

Provision of tech or finance:
- Cost sharing

Provision of technical assistance:
- Offer awareness to private sector
- Systems to help scale adoption of technology

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. This technology development-focused bundle of innovations elicited the highest scores and was ranked both highly innovative and desirable. Importantly, respondents also saw this as a feasible, realistic approach. However, in a concern noted in several comments—and shown in the lower viability score—respondents worried about the ability to identify financing or financial support to take this Story from idea to reality.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? 3.81 out of 5 (27 respondents)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? 4.15 out of 5 (27 respondents)
Viability: Is this innovation likely to be financially viable given market supply and demand? 3.5 out of 5 (27 respondents)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? 4.04 out of 5 (27 respondents)

Strengths

Respondents observed the following strengths in this idea:
Involves private sector; aimed at needed technologies; possible to scale; potentially great impact on food security and incomes simultaneously; addresses policy issues; strong investment opportunity; recognizes need for training

Concerns

Respondents voiced the following concerns about this idea:
Attractiveness to private sector; affordability of technology; political will to support innovations; viability of local production; means of distribution; subsidies to private sector; sustainability of donor support; unclear how precisely technology distribution will occur

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
Strong demand/farmer adoption of tech; private sector will get on board; government support; organized markets and value chains must exist; credit, training, and extension are available; quality technologies exist; production costs drop with expanded production; financing is available

Questions

Respondents asked the following questions, which they believe are important to moving this idea forward:
How do we ensure technology is adopted? How can we combine this idea with other interventions? How can we find funding/financing? How will we communicate with/train farmers? Is it cheaper to import or produce tech locally? How will production of tech be organized?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Build partnerships with investors; build relationships with farmer groups/industry; analyze costs/benefits of and demand for tech; rent tech to farmers; involve many types of actors; manufacture tech locally; use commercial storage facilities to house techs; engage government regulators

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

Practical Training Centers:

From Innovation to Impact

Insights

To better aggregate their produce so that they can sell in bulk to buyers, farmer groups need collection centers that can serve as practical training centers and as hubs for increasing communication between farmers, buyers, and input suppliers so as to boost uptake of relevant post harvest loss innovative solutions.

- Improved infrastructure is key to allowing farmers, buyers, technologies, and extension officers to come together at "one-stop shop" practical training centers.
- Mobile technology is critical for sharing real-time market information between the numerous value chain actors necessary for this model to work.
- It is crucial for smallholders to organize themselves into formal entities such that they can collectively bargain with traders and buyers.
- When farmers organize and aggregate at collection centers or practical training centers, they can obtain higher incomes, possibly become bankable, and further invest in growing their farming businesses.

Impact

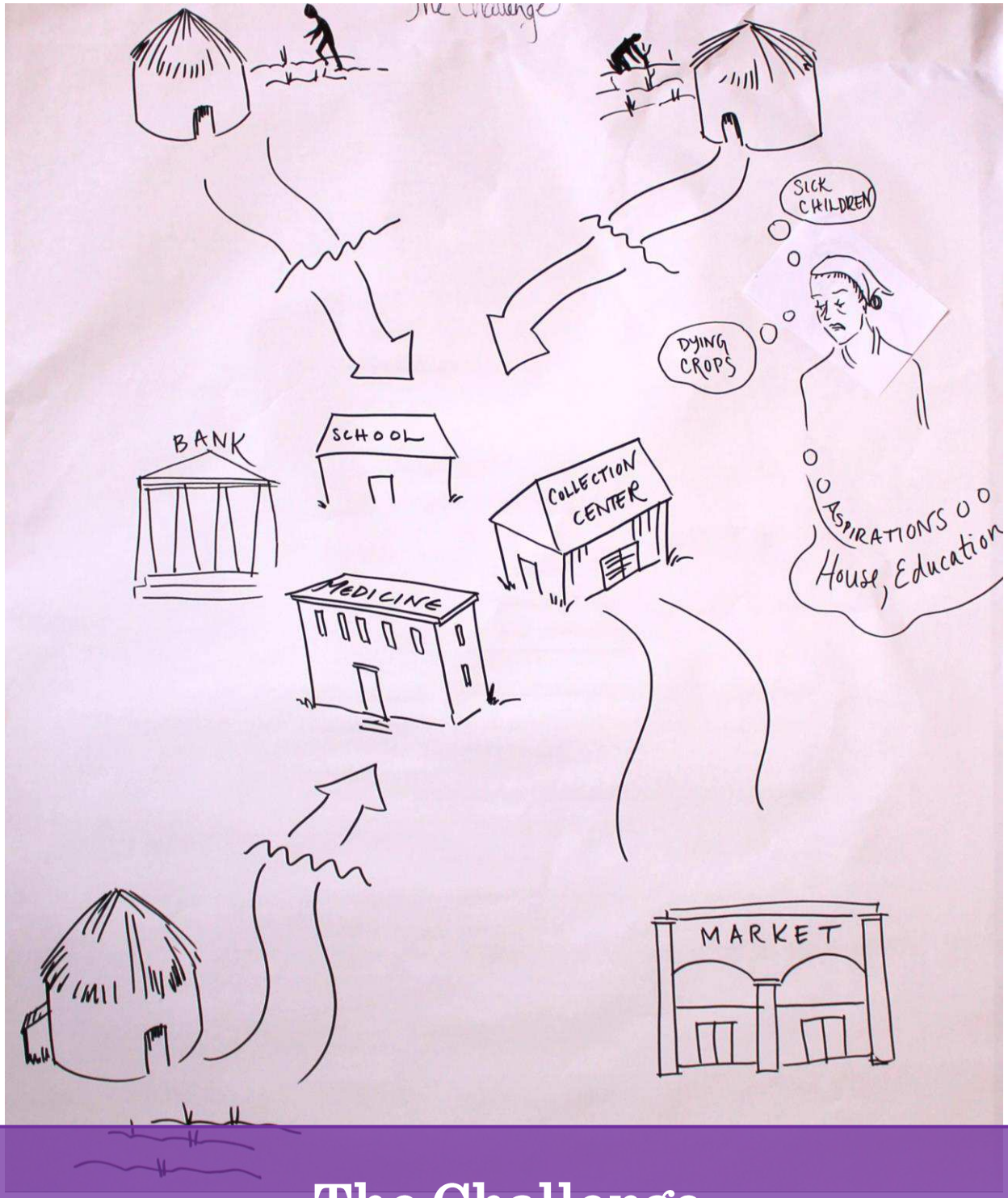
With increased access to proper training on tools and technologies for reducing post harvest loss, farmer groups using the practical training center benefit from the increased quality of their produce. Market information systems and improved infrastructure facilitate the knowledge flows and coordination needed to get that high-quality produce to market, resulting in buyers benefitting from more consistent access to produce that meets their market standards. With increased incomes from improved market access, farmers can further invest in building their farming businesses, and they can provide their families with access to medical care, schooling, and proper food and nutrition security.

Innovations

Once farmers build practical training centers, they need to ensure technology suppliers, trainers, and buyers can all access the centers, which are housed in remote rural areas. To facilitate that access, a platform for collaborative infrastructure development increases efficiency and delivery of improved infrastructure services (such as construction of roads and bridges, etc.). To enhance coordination between market actors, mobile phone-enabled market information systems provide the needed real-time information on pricing, product requirements, and more. Finally, to achieve product requirements, farmers attend comprehensive trainings on best handling practices and proper technology use, delivered by extension officers, market actors, and technology developers each of whom participates in skill building at the practical training centers. The one-stop shop offers an attractive locus for whole-of-value-chain linkage creation and collaboration needed to mitigate post harvest loss.

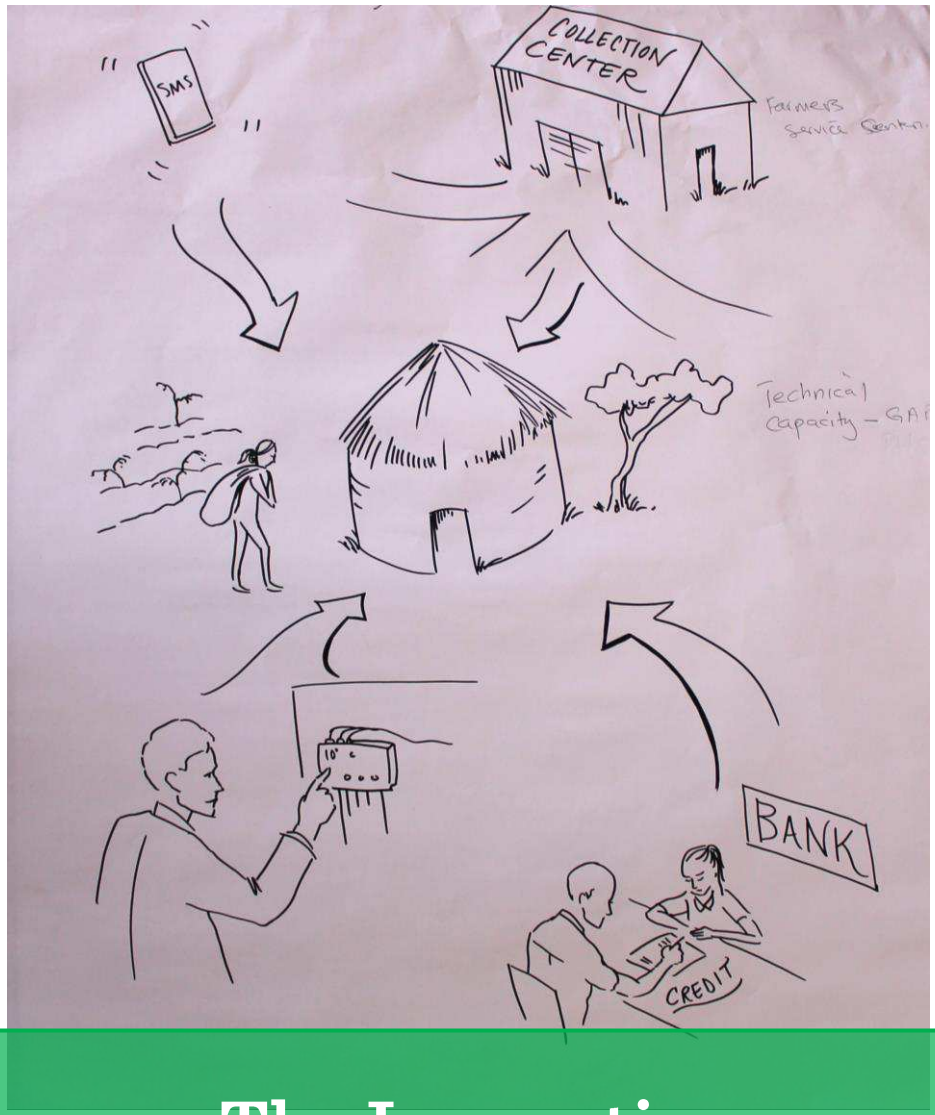
Storytelling Team

Narrator: Jacqueline Mkindi, Tanzania Horticultural Association (TAHA)
Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Betty Kitsao, Coca-Cola; Matt Lineal, Nuru International; Benjamin Makai, Safaricom; Caleb Metto, Youth Agency for Development of Science, Technology, and Innovations (YADSTI); Martin Mutura, Coca-Cola; Willis Owino, Jomo Kenyatta University of Agriculture and Technology; Lusike Wasilwa, Kenya Agricultural and Livestock Research Organization (KALRO)



The Challenge

Sikujua was a smallholder farmer in a rural village in Tanzania who faced many challenges and was very poor. She didn't even have the money to buy her children uniforms to send them to school. She toiled on her farm day after day and constantly felt disappointed because she watched her crops dying before they could be sold. Sikujua had no training on proper post harvest loss reducing tools and technologies. Because Sikujua was unable to decrease her post harvest losses and the spoilage of her crops, she was unable to make any profits and her family suffered. Like other farmers in remote areas with poor infrastructure, she was unable to connect to collection centers. Sikujua wished that she knew how to connect to the resources and information she needed to get her crops to market. But like many other African women, she did not sit back and cry; she remained strong. She knew there was a solution to the challenges that faced her community.

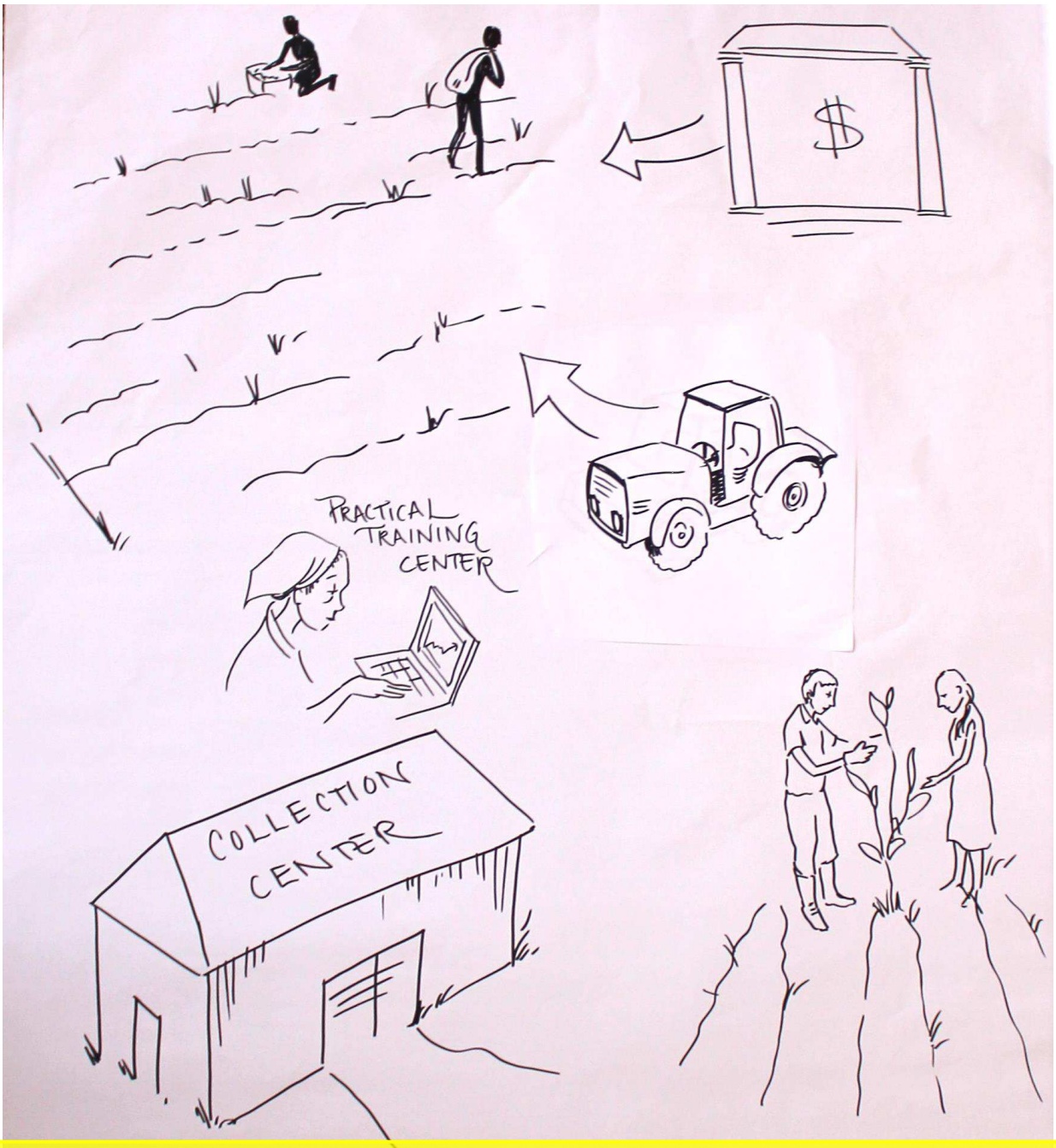


The Innovations

Unsure of where to turn first for help with her situation, Sikujua thought maybe her local leaders could provide some advice. She went to the district authorities and village leaders, who linked her to an apex private sector organization that represents and supports the horticultural sector in Tanzania. She actually managed to get the mobile number of the CEO of that apex organization and she called the CEO. Despite Sikujua's challenges, she was still very confident that there was a solution to her problem if only she could access the right partners. To Sikujua's pleasant surprise, after speaking with the CEO, the apex organization sent the technical team to analyze the post harvest loss situation in her area. After analyzing the current situation facing farmers in Sikujua's village, the association came up with a package of ideas on how to transform those farmers' condition. They decided to introduce a number of innovations.

First, by developing a platform for collaborative infrastructure development and capacity building, the apex organization managed to mobilize resources from the government of Tanzania and development partners to introduce collection centers and build farmer capacity such that farmers could successfully manage collection centers. The apex organization did not just focus on the collection centers, but attached other support services to allow the center to become a novel one-stop shop that provides useful information and technical support services to farmers. Additionally, the organization linked farmers in that area to mobile technology services so they could receive real-time market information (e.g., pricing information), and other agronomic tips in a useful and efficient manner. Through this support, Sikujua and the other farmers built the capacity to work with village and community banks to further invest in their businesses, allowing for increased food and nutritional security.

The apex organization was further able to mobilize partnerships with government authorities and public/private extension support services to use up-to-date training modules and comprehensive systems to teach farmers how to improve their yields and build the critical mass of production needed to sell to private sector buyers.



Resources

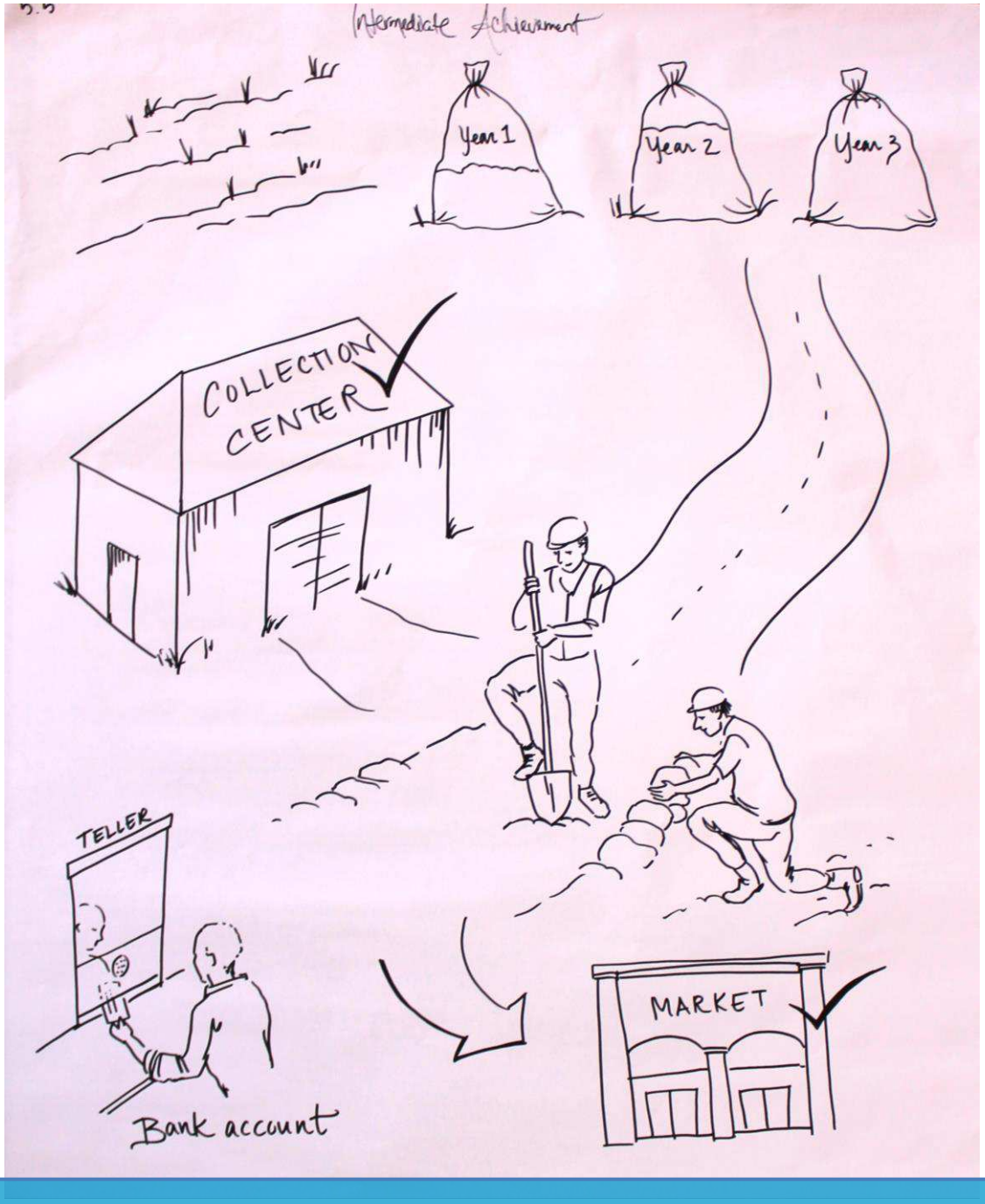
The apex organization, in collaboration with the farmers and other partners, mobilized resources to support the collection centers and improve extension support services from both the public and private sector. The farmers began organizing into more formal entities, which allowed them to cover the costs of the farming tools and technologies they needed to improve crop quality and yields. Thus, Sikujua's farmer group formalized and was starting to build the critical mass needed to access the market.

The Market Information System, launched by the apex organization, was one of numerous innovations that addressed the need to link the entire value chain for more effective post harvest loss reduction. This ensured that no actors were left out of the information diffusion process. Moreover, it ensured that all farmers had access to the trainings and technologies available at the practical training centers. Thus, the practical training centers were one-stop shops providing practical services to farmers so they could not only maintain quality produce, but also get that produce to the market in a timely manner.

Partners & Actions

Sikujua was a born leader, but she rarely had the opportunity to demonstrate her leadership skills. However, because the farmers in her area were used to operating in informal entities, Sikujua took the initiative to encourage them to begin organizing more formally. The groups mobilized and came together to talk about farming issues, build critical mass for production, and collectively bargain for better prices from buyers, who were linked to the farmers through the apex organization from the Tanzania horticultural industry.

Sikujua became the leader of the farmer group in her village and started representing those farmers on the board of directors of the apex organization. With Sikujua's leadership skills and the vibrant horticulture organization behind her, she helped the farmers present their concerns to the Tanzanian government and advocate for policy changes that promoted an enabling environment for increased development of their agricultural value chains. These policy changes included better training programs from extension officers, and affordable financing programs for increased investment in the technologies and information platforms needed to increase the efficiency of the one-stop shop's dynamic practical training centers.



Intermediate Achievement

Putting their skills garnered through the practical training center to work, Sikujua and the other farmers in her village began producing higher quantities of quality produce, creating interest among large private sector buyers in sourcing from their farmer group. Post harvest technologies allowed the farmer group to properly store their produce at the collection centers, minimizing spoilage and maintaining high quality until that produce could be sold.

Through the combined lobbying efforts of the farmers and the apex organization over the previous year, farmers like Sikujua benefitted from improved roads to collection centers, better training programs from extension officers, and increased access to affordable financing. Finally, the farmers' produce was reaching the market, and the farmers were able to access useful business information that empowered them to conduct smart business transactions with traders and increase their own incomes. With those increased incomes, farmers could finally save enough money to further invest in their growing farming businesses.

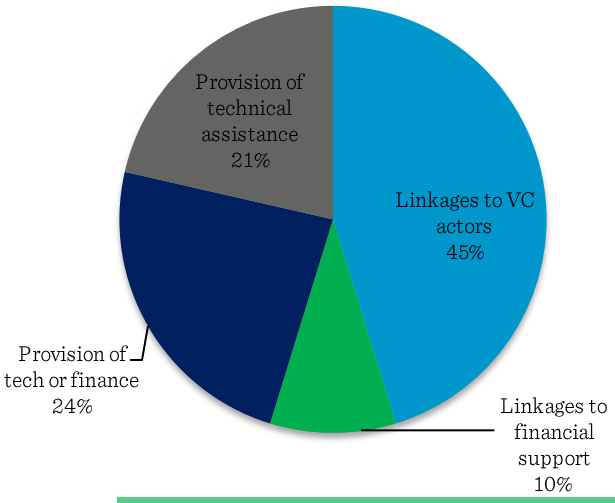
Future Impact

Since Sikujua's farmer group began operating out of the collection center, their post harvest losses had been steadily decreasing. They could finally see a future in which their dreams would become reality. As they continued to connect with buyers through mobile technology systems, they were able to sell more of their produce, which reached high quality food standards thanks to the uptake of post harvest storage, processing, and preservation technologies. Soon, Sikujua would have less anxiety about providing the medical care and education that her children needed. She would be able to save up her money to build a house and provide for her family's needs.

Sikujua knew she had a bright future. It would require partnerships and processes that were private sector led and driven, but also government enabled. Sikujua would work hard to ensure smallholders stayed at the center of the transformation agenda, making sure that other families could benefit from that bright future too.

Evaluation: Perspectives from CC participants on Stories of Future Impact

42 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group 42 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Link to research institutions
- Business support centers

Linkages to finance:
- Link to financial institutions

Provision of tech or finance:
- Investment for collection centers
- Provision of technology

Provision of technical assistance:
- Business strategies/models
- Management of collection centers

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. Like a number of Stories, this received relatively higher scores for feasibility and desirability than for viability and innovativeness. In comments, respondents noted that this idea relies heavily on government support, which may not be consistent. Some also noted that some of the individual elements of the Story (building infrastructure, training farmers, etc.) are not in themselves new ideas, which may explain the low score for innovativeness even as they prove cruicial.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? 3.86 out of 5 (22 responses)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? 3.86 out of 5 (22 responses)
Viability: Is this innovation likely to be financially viable given market supply and demand? 3.27 out of 5 (22 responses)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? 3.14 out of 5 (22 responses)

Strengths

Respondents observed the following strengths in this idea:
Effective information sharing; ability to scale; integrated approach including multiple, essential actors; using PHL technology at centers; participation of buyers; employs collective bargaining; involves government extension

Concerns

Respondents voiced the following concerns about this idea:
Financial viability; management of collection centers; stability of/reliance on government support; sustainability; lack of facilitator; gaining public and private buy-in; unclear what the central innovation is

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
Government support; infrastructure development; sustainable income generation; attractive business plan/private sector involvement; strong markets available; infrastructure boosts farmer uptake; farmers willing to pay for storage

Questions

Respondents asked the following questions, which they believe are important to moving this idea forward:
Is this affordable? Will it be effective in remote areas? How does it reduce PHL? Who will manage centers? How will we add information to Market Information System? What is role of local community/government? How will we decide where to build collection centers?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Integrate more, targeted PHL technology; develop infrastructure; include paid services at collection centers; stronger private sector involvement; target one commodity to start; organize farmers as service providers; find a way to utilize collection centers year-round

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

The Convener:

Joint Action to Mitigate Post Harvest Loss

Insights

Post harvest loss is a multi-sectoral, complex problem. Sustainable solutions hinge on effective coordination and joint action from a variety of stakeholders. To facilitate that coordination and communication, a multi-sectoral network is necessary and a network convener is key to ensuring continued engagement of all network members, both in person and through mobile technology platforms.

- Scientific developments in terms of post harvest technologies should be fueled by the needs of smallholder farmers and not by the academic interests of participating researchers.
- If scientists can learn to make the business case for the technologies they develop, private sector investors would be more likely to invest in those technologies.
- Multi-sector coordination to reduce post harvest loss must be ongoing; in-person meetings should be supplemented with more frequent communication through ICT platforms inclusive of value chain actors across the continuum.
- In order to maintain a high level of network coherence and communication, it is key for a large, neutral organization to take on the role of network convener, tasked with managing and engaging all network actors.

Impact

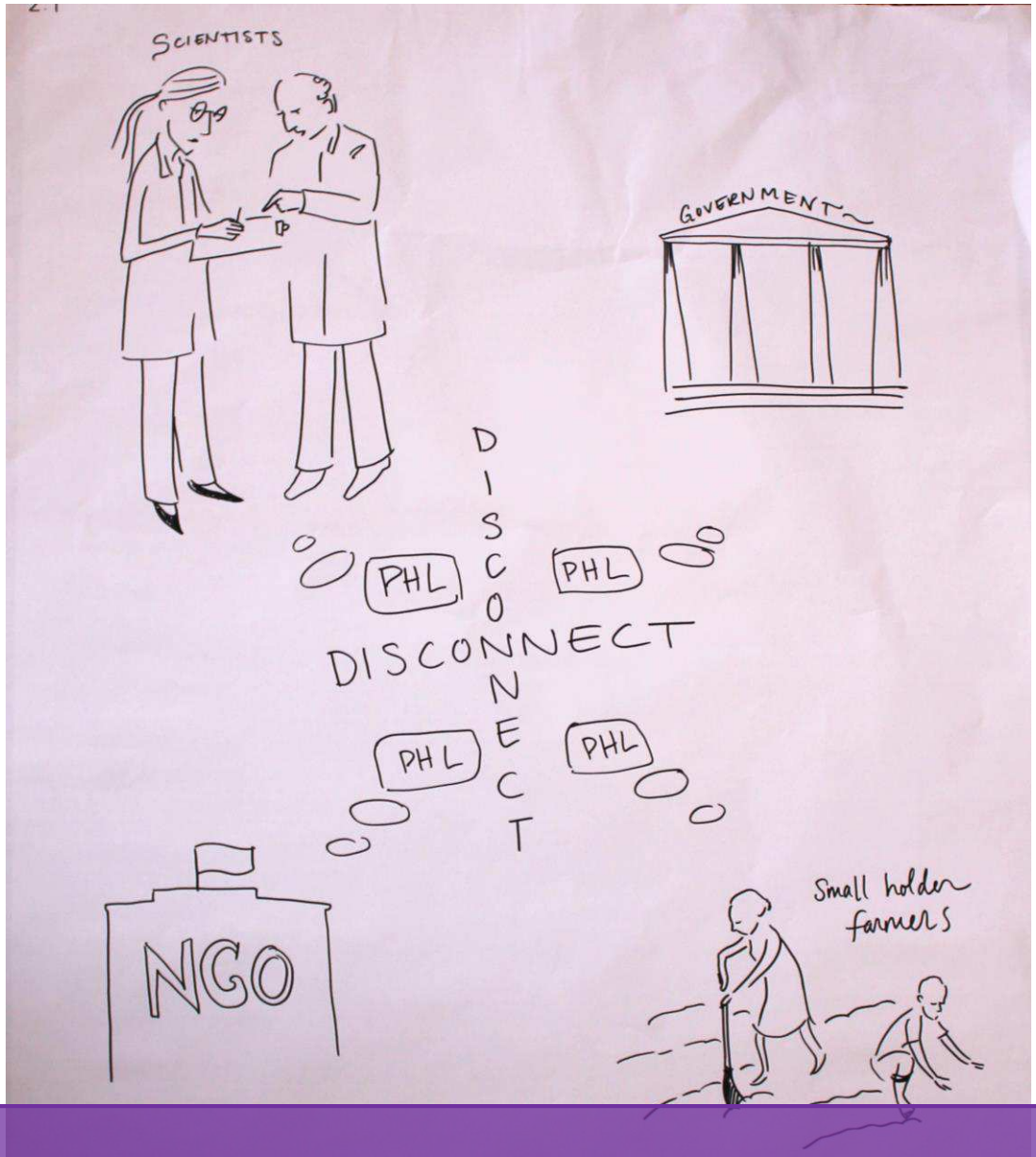
By bringing together diverse stakeholders implicated in post harvest loss reduction, this story of network building, shared insights, and collaborative innovation can contribute to bringing post harvest technologies to scale in Africa. The strength of integrated networks is their reach into the academic and private sectors and their ability to better align with smallholder needs. By aligning these various stakeholders through a well-managed network, stronger knowledge flows can quickly spotlight unmet needs for innovative solutions and pinpoint actors poised to respond to those needs.

Innovations

This story's innovativeness derives from the proposed multi-sector post harvest network with both in-person and online functionality that is coordinated by a designated network convener. Moreover, the network is used as a launch pad for innovative, newly developed or improved post harvest technologies such as the gum arabic edible coating, which preserves antioxidants and delays ripening by functioning as a semi-permeable membrane when applied to the surface of produce. The team explored how government can provide innovation-targeting subsidies to help fund the manufacturing and distribution of such technologies. Financing to farmer groups contingent upon stakeholders developing stronger linkages with one another as is enabled through the network convener entails another type of innovation woven into the fabric of the story,

Storytelling Team

Narrator: Asgar Ali, Center of Excellence for Postharvest Biotechnology (CEPB), University of Nottingham Malaysia. Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Kagwiria Koome, The Rockefeller Foundation; Grace Muinga, African Agricultural Technology Foundation; Fabrice Romeo, Juhudi Kilimo; Rebeccah Ndomo, DK Engineering.



The Challenge

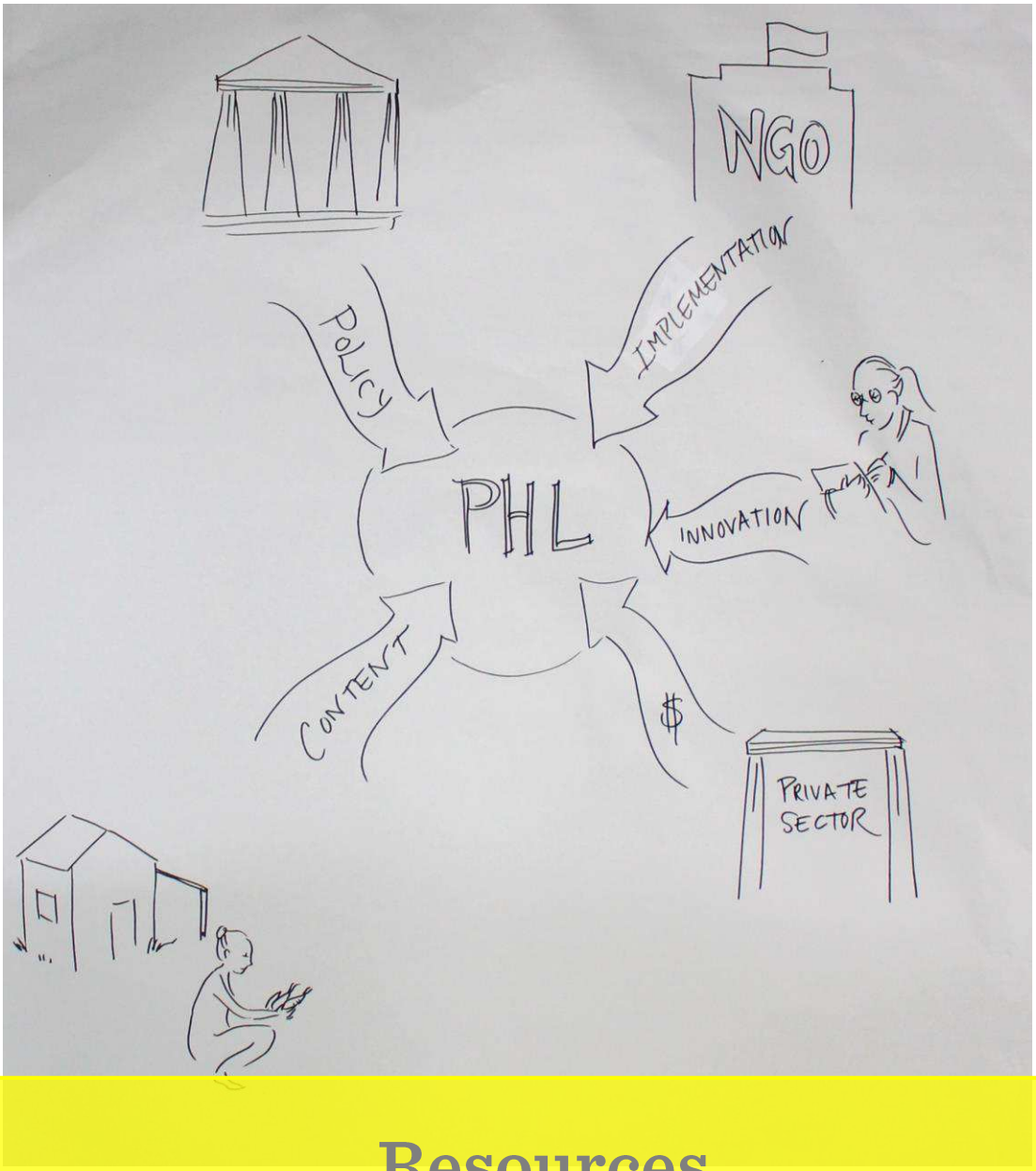
Every day across Kenya, smallholder farmers struggled to make enough income to support their families. They watched their crops spoiling in the hot mid-day sun before they could be sold. These farmers did not have trouble growing enough food—their harvests were sizeable. The problem was preventing the food that was grown from spoiling before it reached consumers' plates. In fact, post harvest losses for food crops were often as high as 30-50% for smallholder farmers across Kenya and Sub-Saharan Africa broadly.

But solving this post harvest loss problem would necessitate going far beyond the realm of smallholder farmers. To reduce post harvest losses, smallholders would need the help of partners and they would need effective collaboration. Smallholder farmers felt very alone in this challenge because they were unable to find and partner with the people and institutions needed to help. What's more, even if they were able to connect to the government, NGOs, scientists, buyers, and other value chain actors, the smallholders did not understand how to communicate their needs and show incentives for working together to solve an issue that affected each of them. The smallholders needed a network of key stakeholders if they were going to make any progress. But pulling together and managing a large multi-stakeholder network is more than one individual can take on. Thus, crucial to success would be a neutral, well-respected organization that could take on the role of "network convener" to manage engagement and ensure effective flow of knowledge and resources among this multi-stakeholder network.

The Innovations

A successful network convener is an organization suited to developing and propagating better business models, offering new methods of tethering online and in-person fora for decision making, and establishing innovative ways of incentivizing university researchers to build closer relationships with the smallholder farmers and buyers who confront post harvest loss every day.

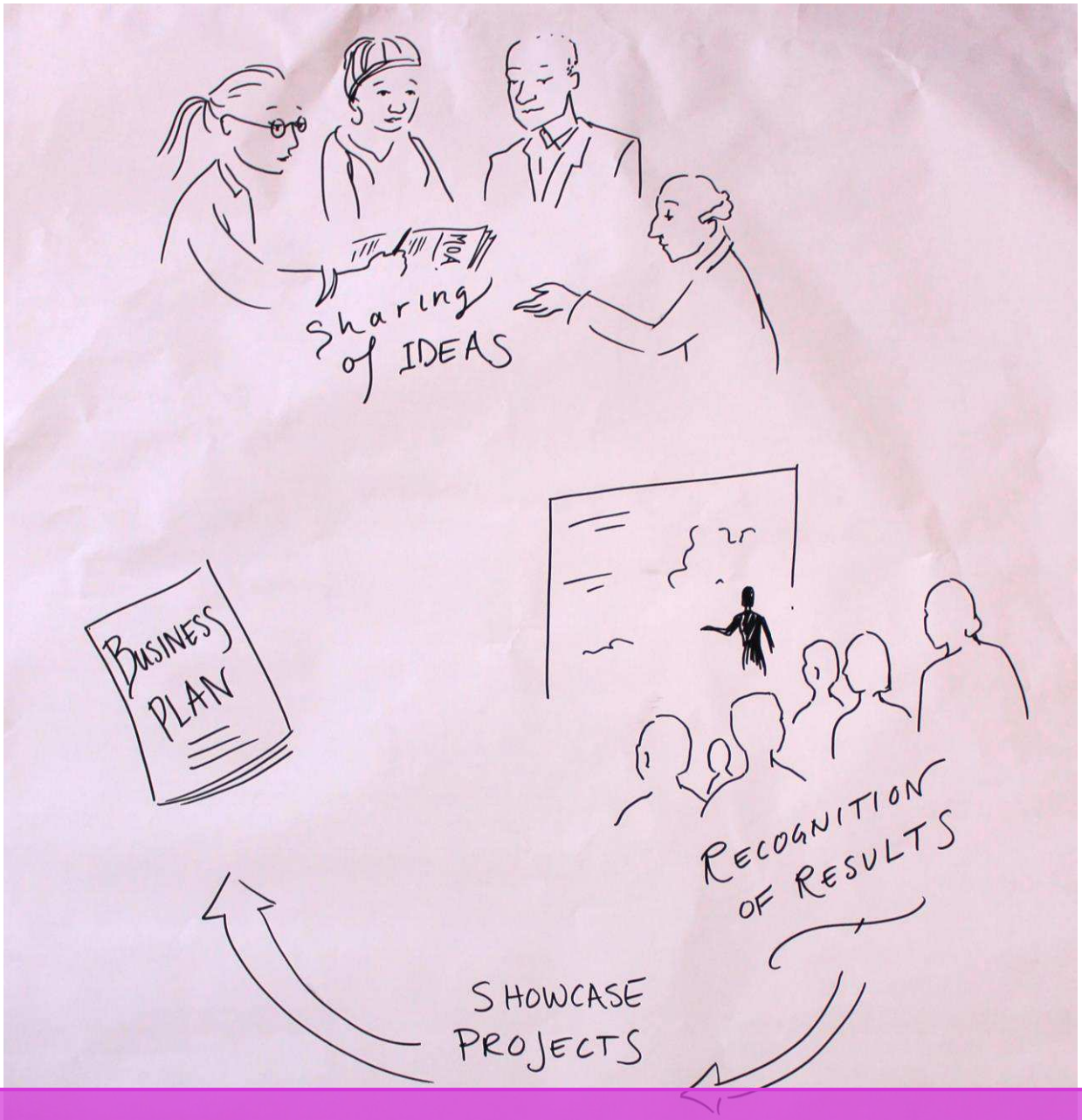
Kenyan smallholders never thought they would see the day when a multi-sectoral network came together to address their daily struggles with post harvest loss, but eventually that day came. It all began when a large development organization decided to invest its time and resources into building that network and serving as the convener. To incentivize participation, the convener worked closely with local scientists conducting research and development on post harvest loss reducing technologies. These technologies helped farmers store, preserve, process, and handle their crops in ways that prevented or delayed spoilage, therefore increasing the opportunity to sell those crops. For example, the gum arabic edible coating is a technology that operates as a semi-permeable membrane to preserve antioxidants and delay ripening. For gum arabic and other technologies, the researchers piloted studies to test the practical effectiveness in terms of reducing post harvest loss. Then, based on these research findings, the convener and the scientists worked to demonstrate both the scientific and business cases for various post harvest solutions—in short, providing a rationale for various actors to invest their time, expertise, and other resources in solving the post harvest loss challenge. Beyond showcasing and marketing those innovations, the convener also highlighted the benefits of an integrated business model that accurately identified farmer needs and connected the many actors required to meet those needs. The convener realized that connecting those actors would require much more than standard in-person meetings. It would require a platform with a unique combination of online and in-person methods to support system-wide flows of ideas and innovations.



Resources

A wealth of resources were needed to bring stakeholders together and to build, manage, and measure the impact of the network. Beyond research and lab testing on the effectiveness of post harvest loss technologies, these innovations required financial planning to connect technologies to smallholder farmers, who often lacked access to the credit needed to invest in the innovations themselves. To continue developing solutions to aspects of the post harvest loss challenge, the convener had to develop platforms (both online and in-person) and obtain the resources to support those platforms such that it could facilitate communication across a wide and growing range of individuals and institutions.

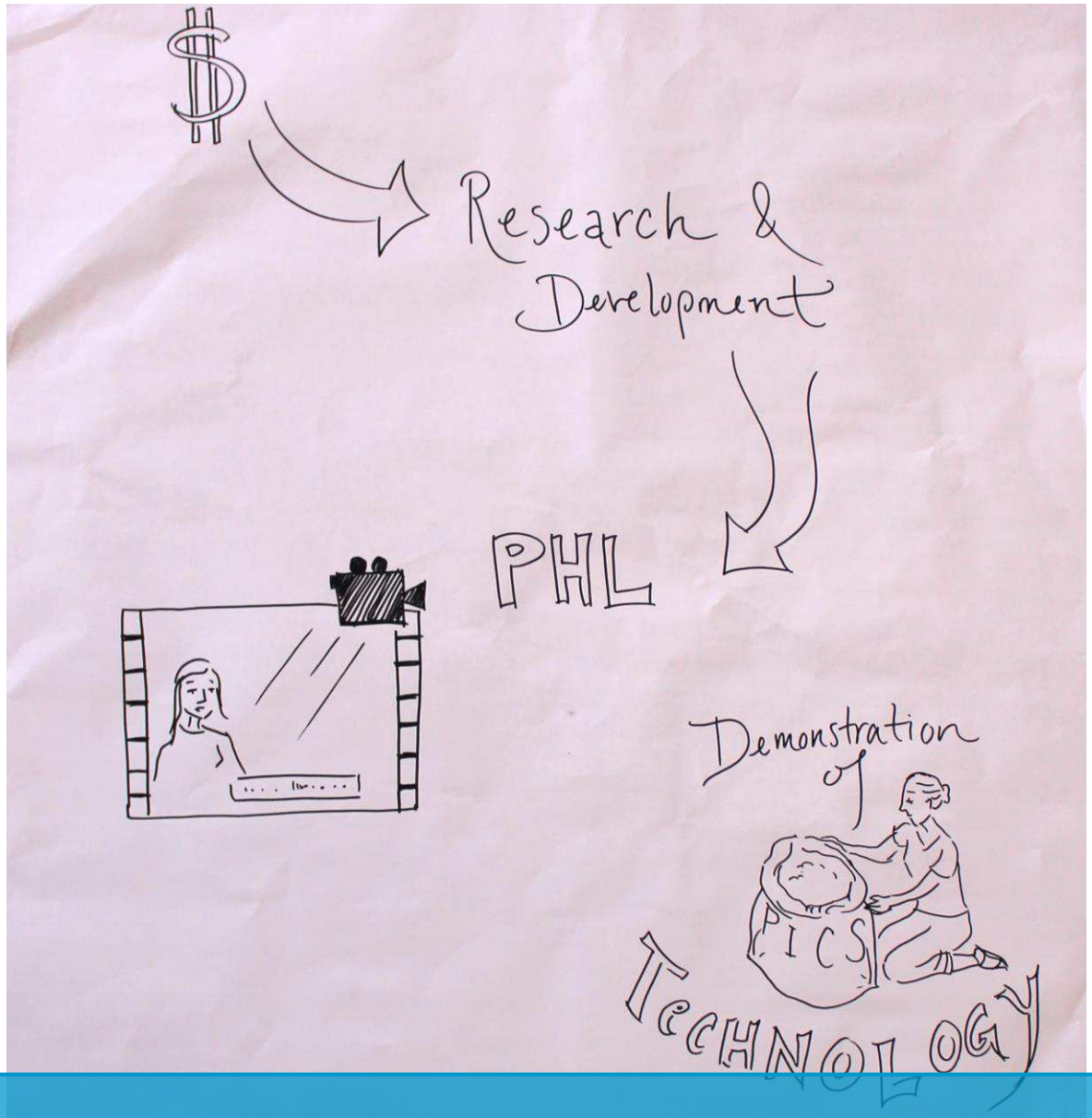
Once the numerous actors joined the network, they each decided to bring their own resources to the table and clarify their roles and responsibilities in a Memorandum of Agreement. Network participants then developed a joint action plan stipulating that scientists meet regularly with private sector companies to ensure all product requirements were met when developing the innovative technologies. Additionally, an NGO took on the role of leading farmer trainings on proper use of post harvest technologies, highlighting whether those technologies would be best implemented on farm or in a collection center run by a farmer-based organization. To ensure continued progress and communication, the convener partnered with a local software developer to create an online platform, accessible through mobile phones, that allowed for real-time information sharing and communication across the network.



Partners & Actions

The convener knew that the participation of a host of partners who had not yet linked together was paramount to reducing post harvest loss. Partners hailed from public, private, non-profit, and academic sectors. From the public sector, this network required strong leadership from those government entities that helped develop and integrate value chains with the goal of commercializing the agriculture sector. Moreover, government partnerships were key for providing access to financing programs through which smallholders could access loans despite their lack of capital or collateral.

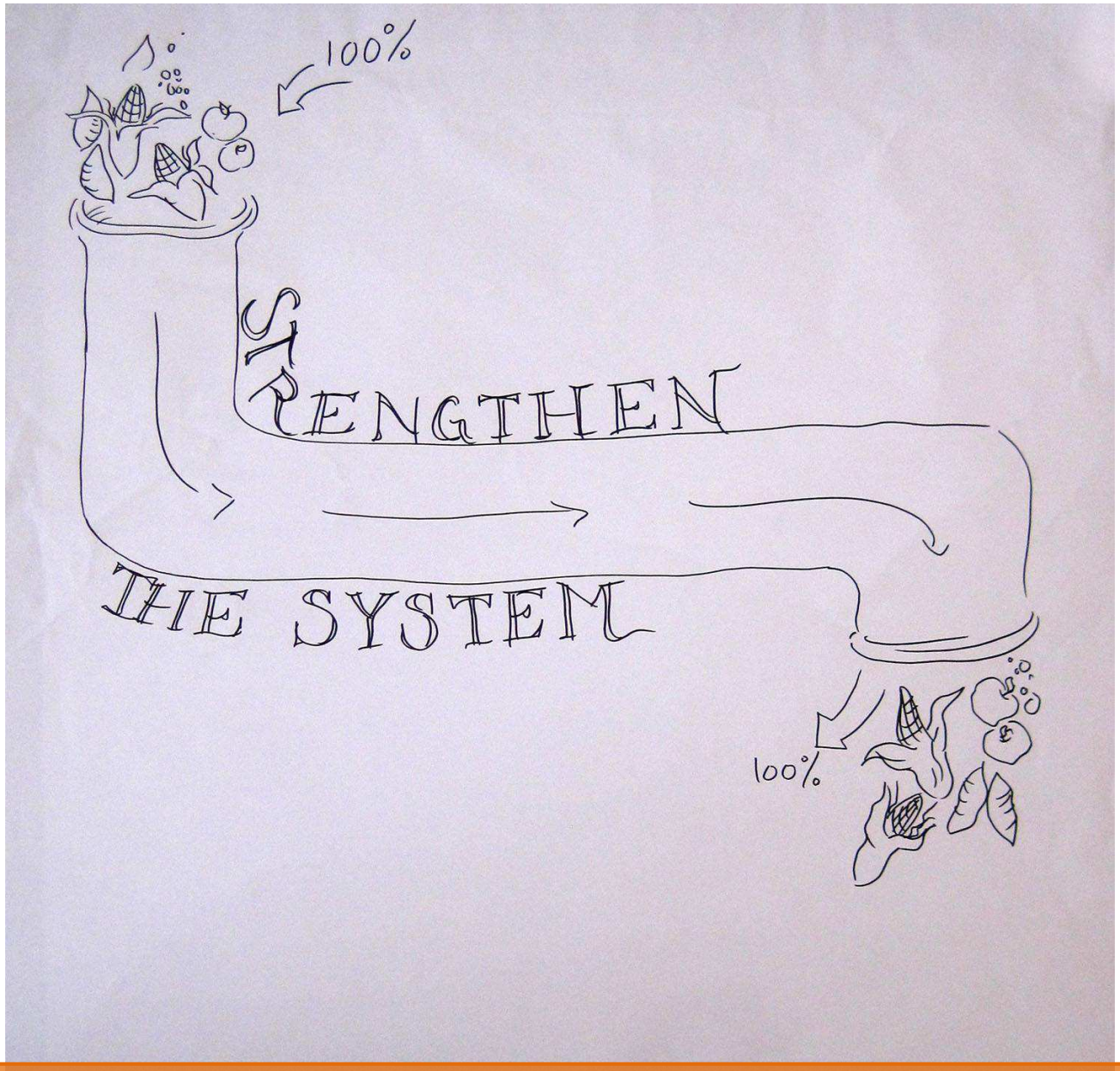
From the private sector, buyers represented market demand. Their role was crucial in terms of articulating the specific crop varieties, volumes, quality standards, and other factors that met consumers' taste profile and spending habits. On the scientific side, continued lab tests and pilot tests were crucial to not only develop new post harvest technologies that meet the numerous needs of the smallholder farmers, but also to tweak those technologies to boost smallholder adoption given limited training, limited capital, and remote locations. In order to ensure that the technologies they developed would be manufactured and distributed by technology companies, the scientific researchers needed to develop business plans that demonstrated the return on investment of developing and scaling those technologies for use by smallholder farmers.



Intermediate Achievement

After the convener succeeded in bringing the diverse stakeholders together in a network meeting, participants discussed their progress updates: namely, that the scientific researchers and technology companies had made adjustments to their gum arabic edible coating technology to meet the market demand and were ready for launch of the product. Getting there meant they worked with a local NGO to run awareness campaigns about the return on investment of purchasing gum arabic. Often, remote smallholder farmers were unwilling to invest in a new way preserving their perishable produce because it marks a stark departure from their traditional methods and they question the result in terms of decreased post harvest loss. Luckily, through local radio shows and word of mouth, the awareness campaign saw some successes. However, many farmers said they would not believe the success of the technology until they saw the benefits for themselves.

In response, the convener worked with NGO leaders to execute a widespread set of technology demonstrations and trainings at various farmer collection centers. Because the gum arabic edible coating technology can be expensive for one individual farmer, it was best for farmer-based organizations to jointly invest in the product to preserve bulked perishable produce at their collection centers. Not only did the NGO demonstrate gum arabic's effectiveness, but they also provided training on how to properly use the technology. With each demonstration, more farmers attended and more gum arabic was sold. The convener was happy for the success but also excited to see how they could replicate the network model for other technologies, value chains, and locations. This was just the beginning.



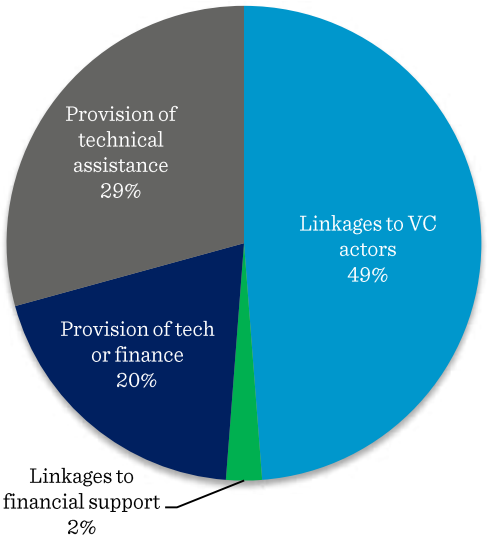
Future Impact

After seeing its intermediate successes, the convener knew that there was a great future ahead and the organization planned to recruit new scientists, new technology companies, and additional farmers to get involved in creating a platform for discussion that spurs the collaboration needed to launch and scale more post harvest technologies for processing, preservation, storage, and handling.

The convener thought about the not-so-distant past, when the farmers with whom it partnered were producing and harvesting large quantities of produce, but losing nearly half of it along the supply chain, with too little produce reaching consumers. But the success of their network showed the convener that they had the ability to strengthen the system and optimize the agricultural value chain. Doing so would enable smallholder farmers to better organize and better communicate with scientists, technology suppliers, and buyers such that they could access the tools they needed to obtain the quality and quantity of crops required by buyers. There was still much to do in reaching that goal, but the convener could finally envision a future Kenya where farming families did not complain about spoiled crops, but rejoiced in their ability to supply large quantities of produce to reliable buyers, ensuring steady incomes and nutritional security for their families and communities. Reaching that vision of the future wouldn't be easy, but the convening organization kept reminding, itself, "Alone we can do little, but together we can do so much."

Evaluation: Perspectives from CC participants on Stories of Future Impact

41 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group 41 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Entrepreneurs/technology fabricators
- Link to mobile technology partners

Linkages to finance
- Specific financial institutions

Provision of tech or finance:
- Provide business support
- Online presence/infrastructure

Provision of technical assistance:
- Facilitation expertise
- Value addition

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. Generally rated lower than some other bundles of solutions, this Challenge received moderately high scores on viability and feasibility, but a low score on innovativeness. This was borne out in some comments that noted the existence of currently operational platforms and conveners; however, other commenters noted that knowledge sharing and convening is highly valuable, if properly managed, rendering it a necessary innovation for an ideal future of curbed post harvest loss.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? Score: 3.67 out of 5 (21 respondents)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? Score: 3.52 out of 5 (21 respondents)
Viability: Is this innovation likely to be financially viable given market supply and demand? Score 3.67 out of 5 (21 respondents)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? Score: 3.29 out of 5 (21 respondents)

Strengths

Respondents observed the following strengths in this idea:
Good platform to connect all PHL actors; strong linkages; well-organized distribution channels; low cost of capital investments; and, collaboration is needed

Concerns

Respondents voiced the following concerns about this idea:
Ability to communicate innovation to farmers; the role of R&D; possibly too competitive; involvement of private sector; difficult to develop/maintain linkages

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
Stable value chains; willingness of actors to participate; a well-managed platform; actors' mindsets would need to change; requires awareness of PHL

Questions

Respondents asked the following questions, important to moving this idea forward:
Who is the convener, and how will the platform work? What is the role of the end user? How do we disseminate the technology? Who will organize actors? To what extent does this serve private sector actors? Do all partners share a common need?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Involve private sector; emphasize functions to be performed by convener; strengthen information technology use; use government to manage linkages; farmers need training; formalize group; ensure independence of convener

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

Jitu's Journey

From Subsistence Farming to Commercial Farming

Insights

Key to attracting large buyers, smallholders often must organize themselves into Farmer-Based Organizations (FBOs) such that they can aggregate their produce at local collection centers. By doing so, they can amass sufficient volumes to lure large buyers. Collection centers should be equipped with the post harvest tools and technologies needed to preserve/handle/store/process produce, so that smallholder farmers are better able to meet the high standards required by the large buyers.

- Extension officers or other trainers should link with FBOs to offer trainings on the various post harvest technologies to be used at the collection centers.
- On farm or close to farm processing can serve as a necessary value addition process to tap into larger market opportunities.
- Contract farming between large buyers and FBOs can free smallholders from their dependence on unreliable or financially damaging middlemen through whom they often offload their produce.

Impact

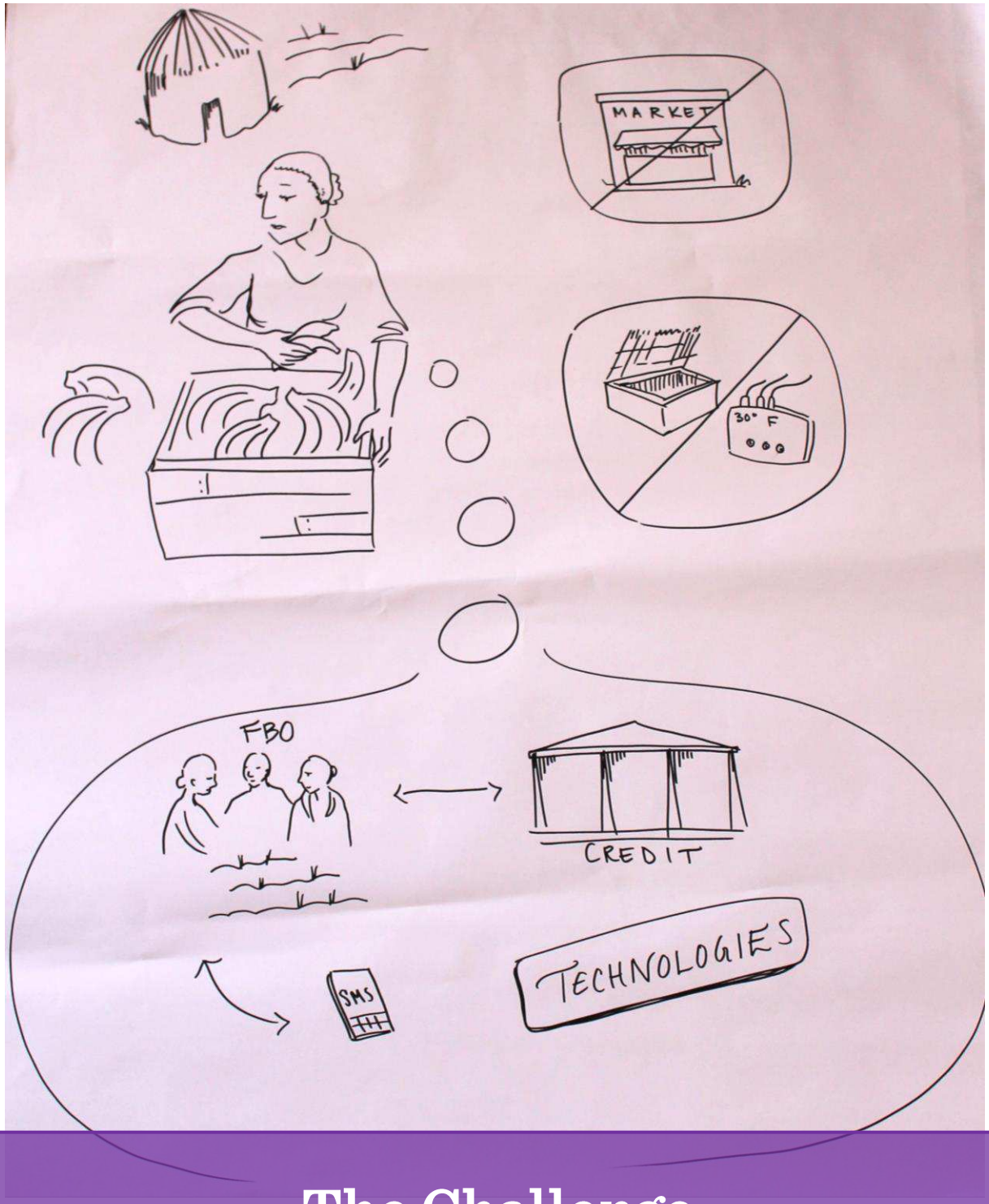
By coordinating with other farmers, smallholders can lower the risk of investing in post harvest technologies and can aggregate their produce for sale to large buyers, eliciting more consistent returns. Trainings for smallholders on proper handling practices and technology usage ensure they can begin to decrease their post harvest losses. These technologies allow farmers to produce reliably high quality produce and store it until it can be sold at the proper time and for the best possible price. Moreover, because contracts with buyers allow farmers to benefit from increased and steady incomes they are not only able to continue investing in their farms, but they can provide the proper medical care, nutrition, and schooling for their children and families.

Innovations

The story of Jitu's Journey would not have been so successful were it not for Jitu's access to training on a variety of post harvest loss reducing technologies that helped her and other farmers maintain and aggregate quality produce at their collection center. First, cold storage is key to the preservation of fruits and vegetables. The CoolBot is a technology that, when combined with a traditional air conditioning unit, could create a cold room with temperatures as low as 35 degrees Fahrenheit. For grains, triple-layer hermetic storage containers prevent pest infestation and deadly toxins. Lastly, mobile processing units allow farmers to turn staple crops, such as cassava, into processed goods that can sell for a higher price at large city markets. Investing in these and other post harvest technologies as an FBO lowers the risk of investment and allows for proper storage/handling/processing/preservation at the collection center. Accessing training on effective use of these technologies builds sustainability into the shared technology model.

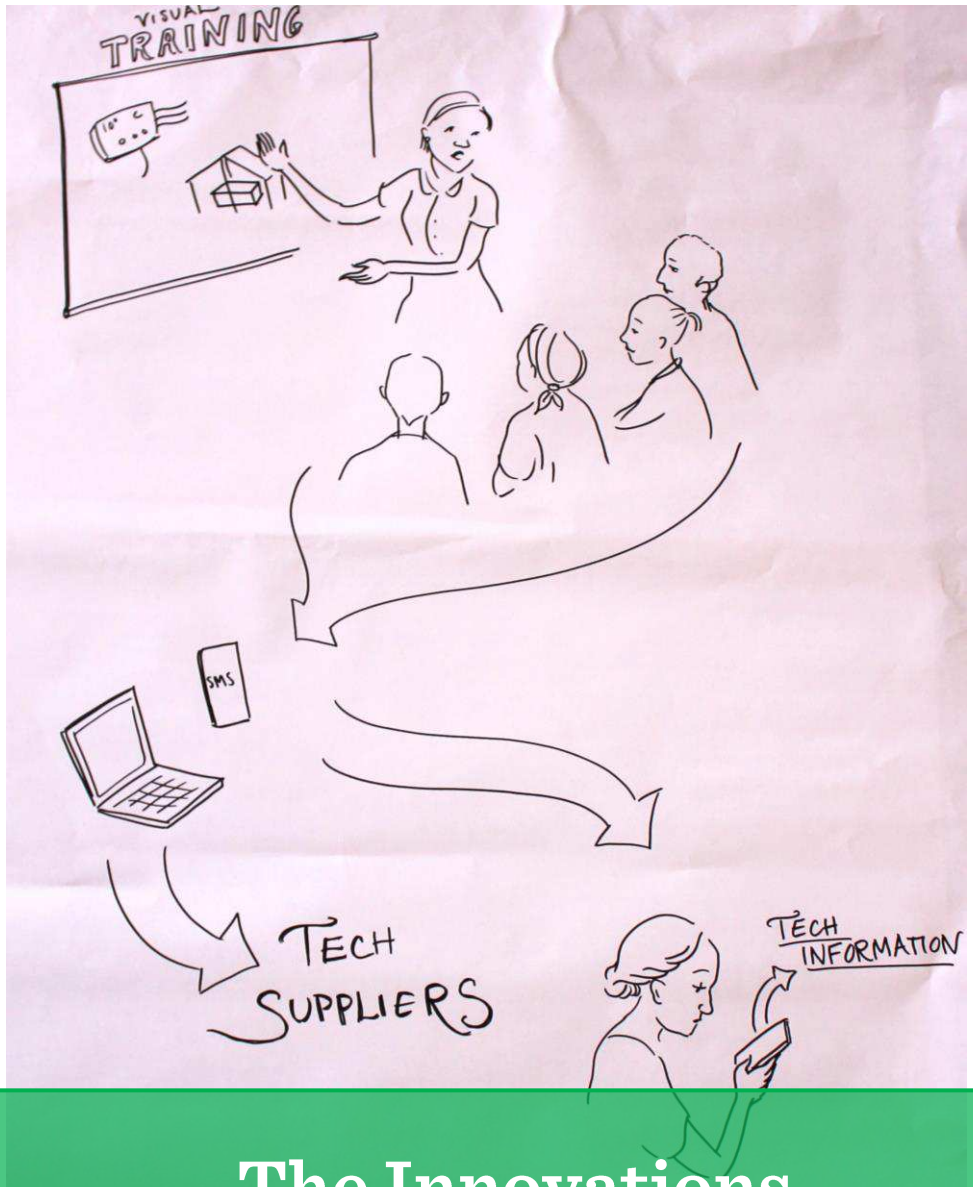
Storytelling Team

Narrator: John Makokha, Africa Agricultural Technology Foundation (AATF)
Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Tamirat Assefa, GIZ; Hakim Baliraine, Eastern and Southern Africa Small Scale Farmers Forum Uganda; Daniel Kioro, Kenya Industrial Research and Development Institute (KIRDI); David Nyameino, Alliance for a Green Revolution in Africa (AGRA); Sebsebe Zewde, GIZ



The Challenge

In a small village in Uganda, a woman named Jitu stood staring at her rotting harvest. Like her mother before her, she was struggling to sell her crops to make enough money to provide medical care, schooling, and proper nutrition for her children. She wanted them to have the opportunities she never had: to become educated, to choose a career path, and to leave their small village if they so choose. But how could Jitu provide those opportunities when she could barely sell any of her bananas, cassava, tomatoes, or potatoes? You see, almost 50% of Jitu's harvest was lost to post harvest rot and spoilage. In the hot sun, her tomatoes and bananas would quickly rot before the middleman was able to come purchase them to sell at market. Keeping her produce in the shade helped preserve the fruits for a short while, but not long enough to make it to market before spoiling. Even her non-fruit crops suffered. For example, cassava spoils just 48 hours after harvest. Finally, Jitu's unreliable middlemen rarely arrived at her farm quickly enough for her to sell it before it went would simply dry out. "There must be methods for dealing with this food loss," Jitu thought to herself.



The Innovations

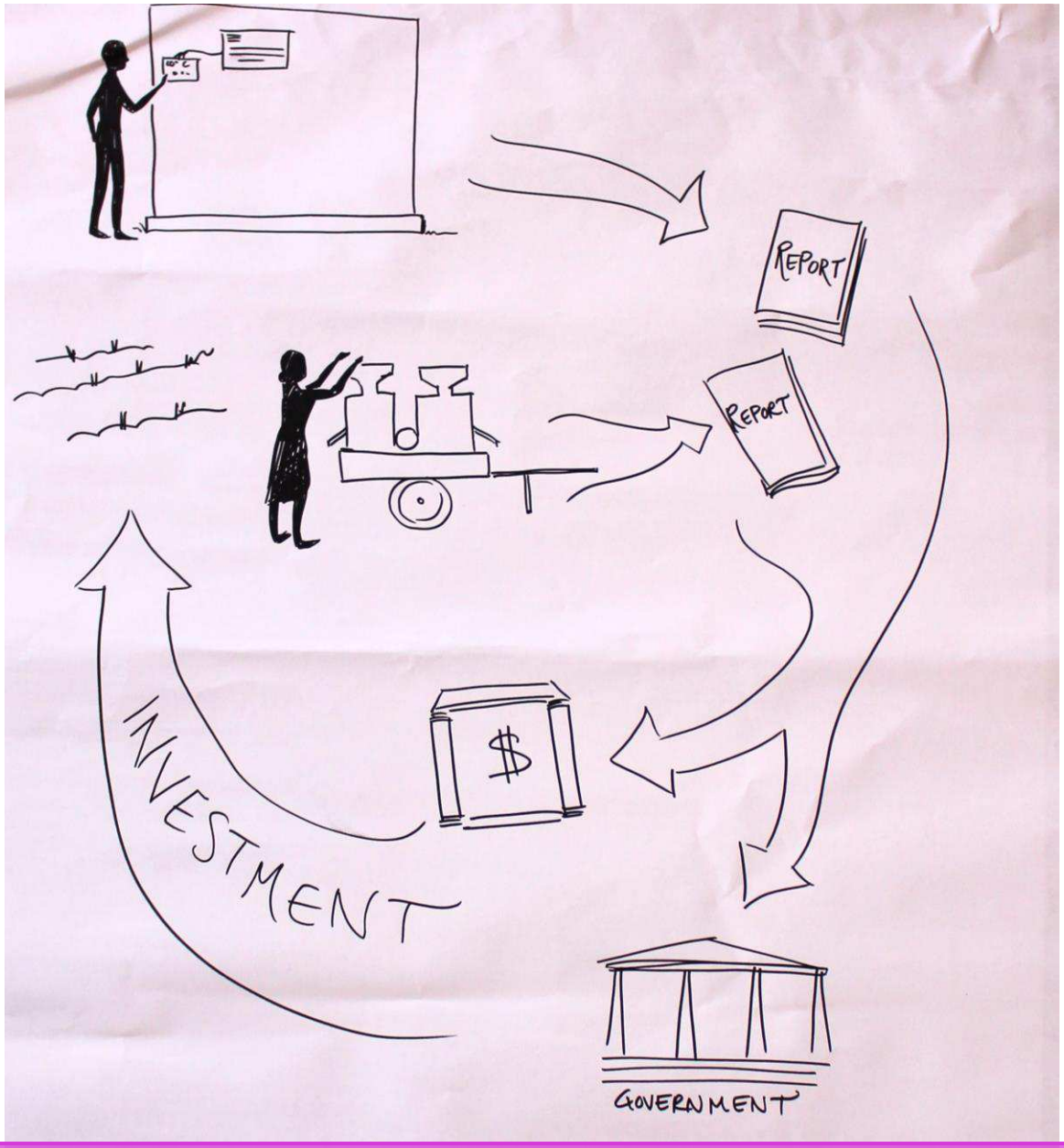
Right on cue, as if the woman had heard Jitu's proclamation, the next morning Jitu received a visit from a government extension officer, who informed her of a training she would be holding later that week on post harvest loss. Jitu was interested in hearing the ideas the extension officer had to help her situation, but was concerned that she would merely tell her and the other farmers to spend money they didn't have on technologies they didn't know how to use. While walking to the training, Jitu thought about the numerous other trainings she had attended. She appreciated the explanation of various technologies and techniques for reducing post harvest loss, but it was sometimes hard for her to retain all that information. This training looked different though. Jitu walked into the classroom and saw lots of posters and even a video playing. She was excited about these new, easy to understand methods of visual learning.

After talking about proper handling practices for perishables, the extension officer showed a video of a new innovation called the CoolBot, which hooks up to an air conditioning unit to create a cold room for storing perishable goods at temperatures as low as 35 degrees Fahrenheit. Next, she showed a demonstration of a triple-layer hermetic storage bag called a PICS (Purdue Improved Crop Storage) bag that would allow farmers to store their grains without pest or mold infestation, allowing farmers to sell at non-peak times for a higher profit. Finally, the extension officer taught the group about mobile-processing units, which could be used on farm or close to farm to process goods like cassava for value addition and higher market prices. What's more, processing perishable goods right after harvest increases shelf life and decreases post harvest loss. After answering lots of questions, the extension officer explained that she was out of time, but that she would be back each week as part of a training series on post harvest loss reducing technologies. In the meantime, she shared with the trainees an SMS technology platform that would allow them to coordinate with the technology suppliers so they could jointly purchase the tools and technologies needed to start reducing their post harvest loss.

Resources

"Well I learned a lot..." Jitu said as she left the training. "It's just too bad I can't afford those technologies. I might be able to save up for some PICS bags, but I don't even harvest grain. What a shame." Then Jitu had an idea; if she could call the other farmers who were membersin her Farmer Based Organization (FBO), they might be able to work together to build a collection center. This way, the FBO could jointly invest in the post harvest technologies they just learned about at the extension training. The farmers could then use the technologies on their aggregated produce at the collection center.

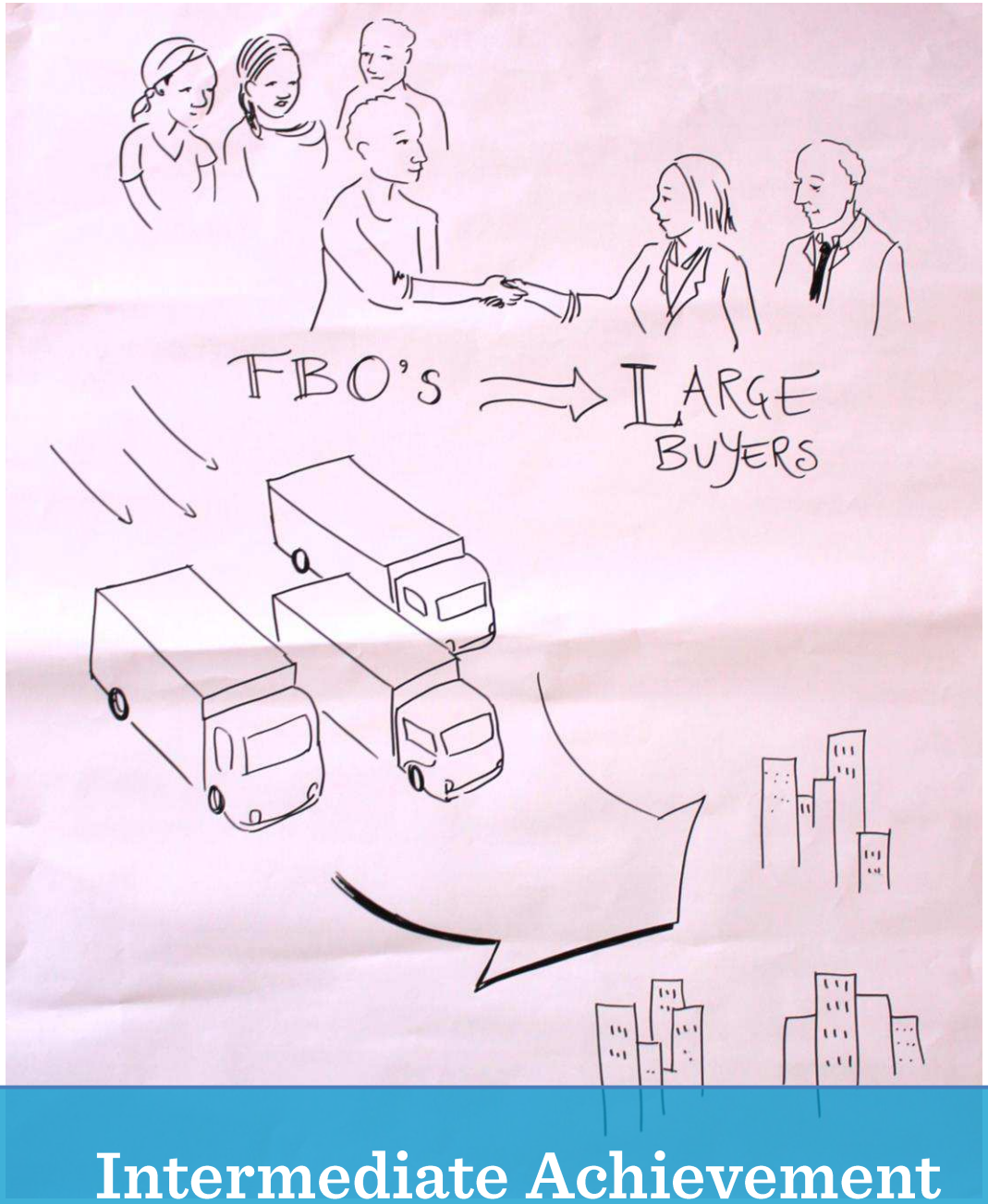
The next day, Jitu called the other farmers in their village on her phone and invited them to an FBO meeting at her home to discuss the launch of their collection center. At first, a number of farmers were not interested in participating because it was not how they were accustomed to harvesting their produce. They did not see the point in bulking their produce when they had a broker who came to their farm, purchased their produce, and then sold it at market. "But how much of your produce can you actually sell? I bet nearly half of it goes to waste before the broker arrives," replied Jitu. "Imagine if we all had access to new technologies that could reduce our post harvest losses...we could make much higher profits!" Eventually, Jitu succeeded in getting most of the farmers behind the idea of building and using a collection center to sell their produce in bulk to larger buyers. The FBO invested in low-cost plastic crates to carry their produce so it would not be damaged during transport to or from the collection center. When the extension worker came back to the village for the next post harvest training, she helped the FBO collect data on how much produce they were growing and which markets might be able to sell that produce. From that point forward, the extension officers held their trainings at the collection center, where they continued to help the farmers improve their agronomic practices.



Partners & Actions

Because of the baseline data that the extension workers helped the farmers gather, Jitu's FBO was able to document stories about the success of aggregating produce at their collection center, which the extension workers helped them distribute to a number of private sector buyers. As a result, private sector interest in sourcing from their community skyrocketed. It was clear to buyers that the collection center was consistently aggregating and storing crops so that the companies would be able to reliably purchase the produce in bulk. Not only were firms continually interested in investing in the community by buying the produce, but they also had an interest in investing in post harvest technologies to be used by the FBO at the collection center. From the company's point of view, the investment in additional technologies would further ensure the high standards of the food they were purchasing. So the private sector companies set up CoolBots, mobile processing units, and more at the FBO's collection center.

The mobile processing units allowed for value addition so the buyers could sell at market for a higher price. But the collection center was not just getting support from private sector companies. The Ugandan government also had an interest in increasing nutritional security nation-wide and boosting the country's economy. Thus, they started a program to increase investment in infrastructure in the hopes of fostering an enabling environment that supported further private sector investment in sourcing from smallholder farmers.



Intermediate Achievement

Slowly but surely, Jitu worked with the extension officers and other government workers to develop a "How-To" guide for taking a village from subsistence to commercialization by launching collection centers that house all necessary post harvest technologies for the variety of crops being bulked at the center. As a result, FBOs began cropping up all over that part of Uganda. Jitu served as a leader of her FBO, but also served on a committee with other FBO leaders, so they could discuss methods for engaging with the private sector. The well-organized network of farmers started to attract larger buyers because they saw the investment potential of sourcing from collection centers that were well equipped with the right tools and technologies to sell extremely large quantities of produce. The large buyers had an interest in purchasing goods in bulk to transport back to the city for sale at the large markets. For the smallholder farmers like Jitu, this meant increased profits for two reasons: (1) their produce sold for a higher price at the large city markets, and (2) because the large companies wanted to invest in post harvest technologies to ensure high food quality, the farmers did not have to invest as much of their own money.

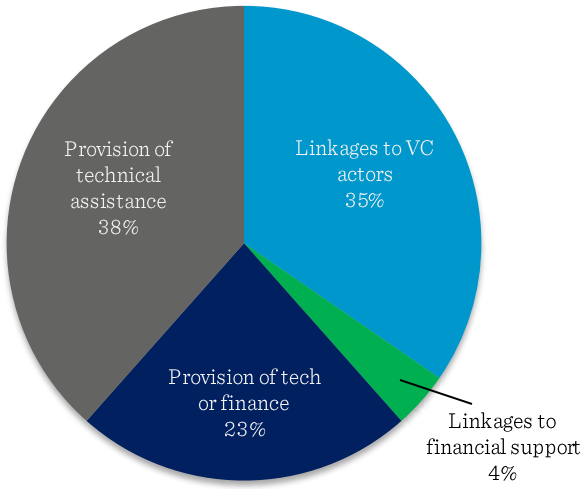
Beyond benefitting from reduced post harvest loss and increased incomes, Jitu and her FBO would also benefit from *consistent* incomes because they began signing contracts with the large private sector buyers. Lead farmers, like Jitu, would meet with the business managers and sign contracts that stipulated the amount of crops to be sold, the types of crops to be sold, the food quality standards that must be met, the time of sale / pick-up, and the price. Jitu thought back to the many days she waited on middlemen who never showed up to buy her produce. Signing contracts with private sector buyers was a huge leap forward from that point.

Future Impact

Although she had just signed her first contract with a large-scale private sector buyer, Jitu could not stop smiling. She had high hopes that the consistent, reliable buyer would mean greater incomes and opportunities for her family and for all farmers in her FBO. Jitu was already dreaming about what those increased incomes could mean for her family. With a larger income, she could invest in a bigger house, a car, a water pump, electricity, and better medical care for family. Moreover, she would always be able to afford the school fees and uniforms necessary to keep her children to school. In sum, she dreamed of a life that was transformed such that she would no longer have to suffer the small setbacks that would prevent her from growing her farm, growing her business, and growing her family. Jitu knew that others would similarly benefit if they, too, began organizing into FBOs with collection centers that housed the post harvest technologies necessary to source high quality produce to large buyers. Jitu helped transform her community from subsistence farming to commercial farming and she had a good feeling others would follow her lead.

Evaluation: Perspectives from CC participants on Stories of Future Impact

26 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group 26 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Connection to trainers
- Implementing organizations

Linkages to finance:
- Financial institutions

Provision of tech or finance:
- Investment for aggregation centers

Provision of technical assistance:
- Creation of business models
- Market analysis

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. Perhaps due to the Story's reliance on existing technologies, and well-known techniques such as farmer training, respondents rated this bundle of solutions as highly feasible and strongly desirable, but less viable and somewhat less innovative. Respondents noted their concerns that financing and investment may be difficult to attract.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? 4 out of 5 (19 respondents)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? 3.94 out of 5 (19 respondents)
Viability: Is this innovation likely to be financially viable given market supply and demand? 3.44 out of 5 (19 respondents)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? 3.59 out of 5 (19 respondents)

Strengths

Respondents observed the following strengths in this idea:
Strong long-term program goals; increases private sector investments; promising focus on scalability; enriches research/links research; strong dissemination of information; role of ICTs is a strength; alignment between farmers and business is ideal

Concerns

Respondents voiced the following concerns about this idea:
Affordability/adoption of technology; ability to find financing; weak linkages; scalability; buy-in from government; lack of emphasis on commercialization

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
Sustained trust/cooperation between actors; profitable markets; functioning rural institutions; ICT must be able to boost demand; effective governance

Questions

Respondents asked the following questions, which they believe are important to moving this idea forward:
How will farmers embrace technology? Who will own/manage collection centers? What are the core innovations? What are the methods for distribution? Does this require improved capacity in collection centers/how can training be more innovative?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Need better research plans; use ICT platforms/apps; involve industry as buyers; analyze private sector demand; have onsite training/education; evaluate success; be specific on products, interventions, markets;

The Waste and Spoilage Social Innovation Lab's Storytelling for Innovators presents:

Aggregation for Secondary Markets Turns Mango Losses into Profits

Insights

Smallholder farmers often rely on a single market outlet for their crops and when that buyer doesn't stick to his purchase agreement or decides the produce is not of high enough quality, those farmers are unable to elicit any profit. To prevent that situation from occurring, farmers benefit from access to and awareness of secondary or "alternative" market opportunities to turn to when the primary market does not pull through.

- Secondary market opportunities often require processing or other methods of value addition.
- Through the help of government financing, investing in post harvest technologies allows farmers to prepare their produce for different types of market outlets, either by preserving them for fresh markets or processing them for a number of different food products.
- Information and Communication Technology (ICT) is critical for increasing coordination between producers and buyers and for informing farmers about secondary market opportunities.
- Quality data on producers with available, surplus produce and buyers/processors with demand for that produce is essential to functioning secondary purchase arrangements.

Impact

Through increased uptake of post harvest technologies for preservation and processing at collection centers, farmers can increase the quantity and quality of their crops such that they can sell to secondary market actors. Through increased incomes, those smallholder farmers can begin making long-term plans about marketing different food products for different consumer groups, from local markets to the large cities. By coordinating through mobile technology FBOs can increase efficiency of logistics systems and better communicate with private sector buyers—both in terms of primary purchasers and secondary market alternatives. The end result is one in which farming families have the income and nutritional security to support happy, healthy lives andthe ability to improve their own futures.

Innovations

The innovations in this story center around secondary market actors, which can be identified by analyzing regions in which farmers are overproducing crops for export market and in which processors are willing to source produce from new actors and/or for new food products. To bring low-tech and efficient processing technologies closer to the farm, this story relies on innovative aggregation and logistics systems. When farmers use collection centers to sell their produce in bulk, they are not only able to tap into secondary markets, but they are also able to jointly invest in post harvest technologies that increase the quality and quantities of their yields. Financing models targeted at smallholder farmers further incentivize these investments. Once Farmer-Based Organizations (FBOs) have created more efficient and high-quality systems of aggregating, preserving, and processing their produce, novel marketing platforms can routinize exchange of information regarding market opportunities and other essential information between various secondary market actors and farmers themselves.

Storytelling Team

Narrator: Henry Kinyua,, The United Republic of Tanzania President's Office
Collaboration Colloquium participants who designed this story and conceptualized the key innovations, resources, and actors to render it include: Otim Bernard, Farmers Center; Justus David, Youth Agency for Development of Science, Technology, and Innovations (YADSTI); Olivia Karanja, The Rockefeller Foundation; Isaiah Kirema, TechnoServe; Steve New, Fintrac; Jean Njiru, Farm Africa; Manu Scharer, Nestlé

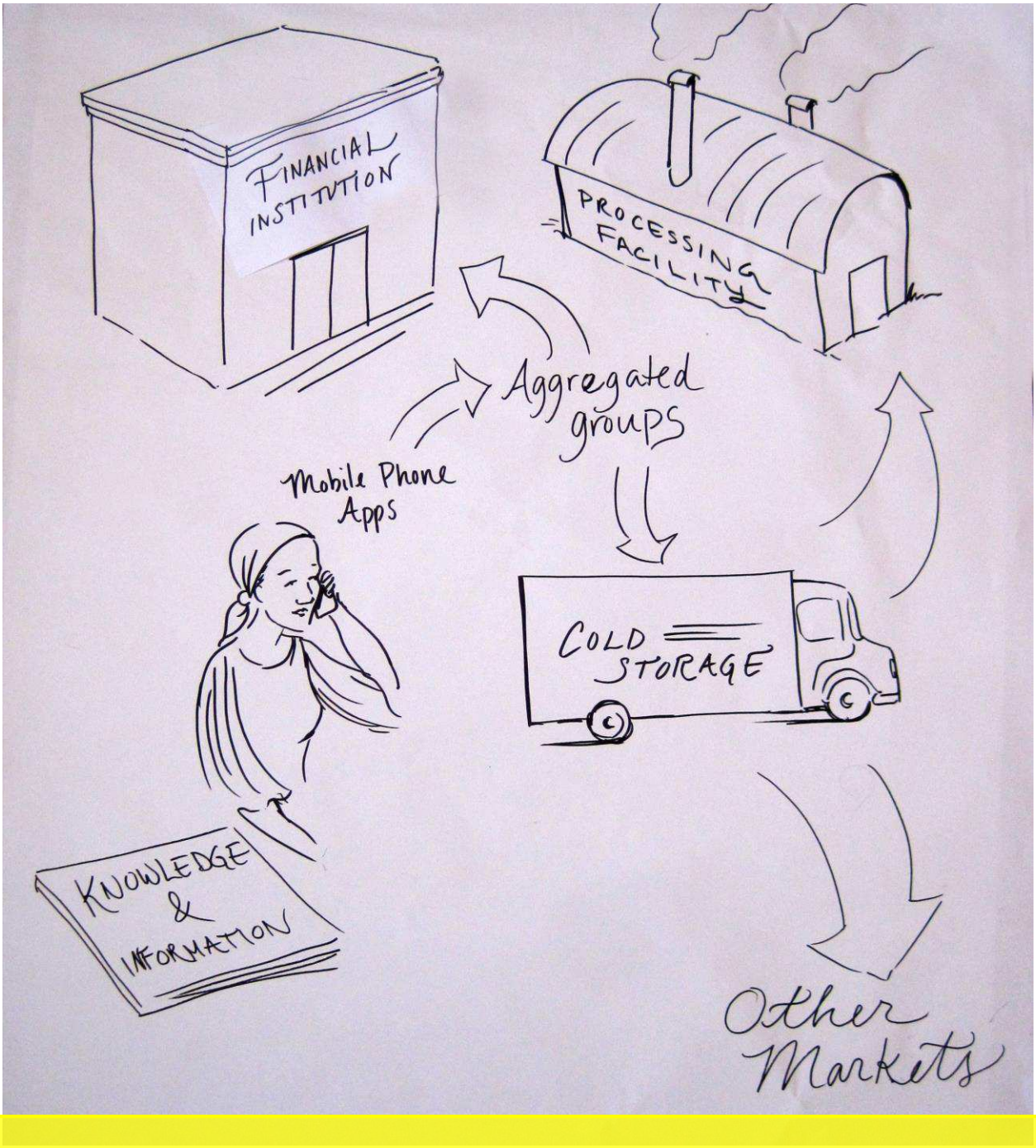
The Challenge

Faida is a smallholder mango farmer from a small village in Tanzania. Like millions of other mango farmers in the region, she produced much more than she was able to sell. Unequipped with the proper tools and technologies for post harvest handling, Faida and other farmers resorted to having their young boys climb the trees, pick the mangoes, and let them sit on the ground until a buyer could come pick them up. This poor handling resulted in very high levels of post harvest loss. While farmers were sometimes able to sell to a large, fresh produce export company, they were often not able to sell their mangoes because they could not maintain the quality standards required by the buyer. When explaining the problem to her friend, Faida said that her situation represented "pain, hunger, poverty." Because they couldn't get anyone to buy all the mangoes they were producing, their fruit constantly went to waste and Faida's family struggled to support a healthy, happy livelihood. What Faida really needed was a secondary market opportunity, or new market outlet, for her mangoes.

The Innovations

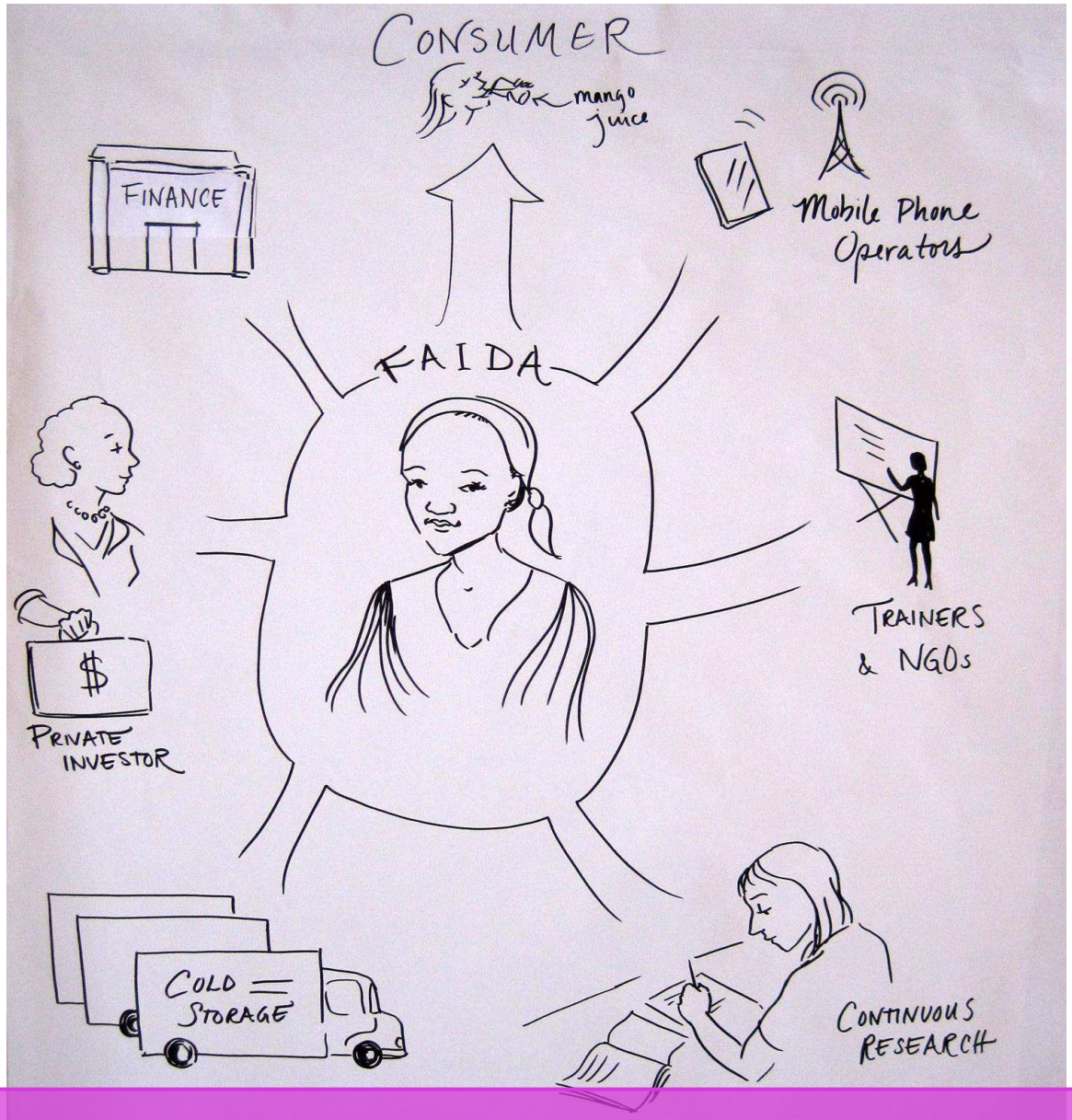
After speaking with her friend, Faida had a meeting with the other members of her Farmer Based Organization (FBO). As usual, everyone was complaining about the fact that they could never sell all the mangoes they produced. Most of their fruit was spoiling and going to waste waiting for buyers that never came. The FBO was only able to sell a small percentage of the mangoes it grew, which was a devastating blow to each farmer's income generation. Everyone kept asking, "Are there secondary markets to which we can sell?" Faida posed a potential solution: "What if we stopped trying to source fresh mangoes only and thought about selling to processors as well? There must be processors that need mangoes to make juice, canned fruit, and other food products. Maybe they are just unaware that we have all these mangoes here, waiting to be sold." The other farmers nodded their heads in agreement. They didn't know if Faida's idea would work or if there were processing companies willing to source from their FBO, but they were willing to find out. Atthis point, they had nothing to lose. So Faida made it her mission to contact the buying agent for one of the local processing companies. When meeting with Faida and other FBO members, the agent made clear that the FBO would need to have a central warehouse, or collection center, at which to aggregate their produce so the company could purchase it in bulk. Luckily, Faida's FBO had already built a collection center and they would just need to develop more efficient ways of organizing the logistics of bulking their mangoes.

Additionally, the agent noted that it would be ideal if some of the initial, low-tech processing could occur at that collection center. Using this machinery at the center would mean that the FBO could jointly invest in the technology, and it would be less of a financial burden on each farming family. "That sounds like a great idea, but we have only been selling a small percentage of our mangoes, so we don't even have enough money to jointly invest," Faida explained. The agent told Faida about a government program that provided limited-guarantee loans to FBOs so they could invest in agricultural technologies and equipment to increase market access. Faida decided that her FBO should apply for one of those loans. She thanked the agent for her help and invited her to come to their FBO meeting the following week.



Resources

At the FBO meeting, the agent gave a brief presentation thanking each of the farmers for gathering together to discuss this exciting new step of partnership for processing mangoes. Additionally, the agent explained the new method for sourcing their aggregated fruits. The company and the FBO would sign an agreement that stipulated the amount of mangoes to be sold at what time. The company would then pay the FBO and transport the mangoes for further processing, and eventually for sale at market. Before, the farmers were only selling a small percentage of their produce, but they now realized they needed *even more* produce than they already had. To grow more mangoes would require additional inputs and post harvest technologies that they were not using previously. If the FBO was going to jointly invest in these new inputs, it would have to find a better way to organize itself. The farmers would need to expand their collection center, purchase the inputs (e.g., cold storage technologies for preservation of perishable goods), learn how to properly use the technologies, and develop an effective communication system using their mobile phones to coordinate collection times, distribution routes, income distribution, and more.



Partners & Actions

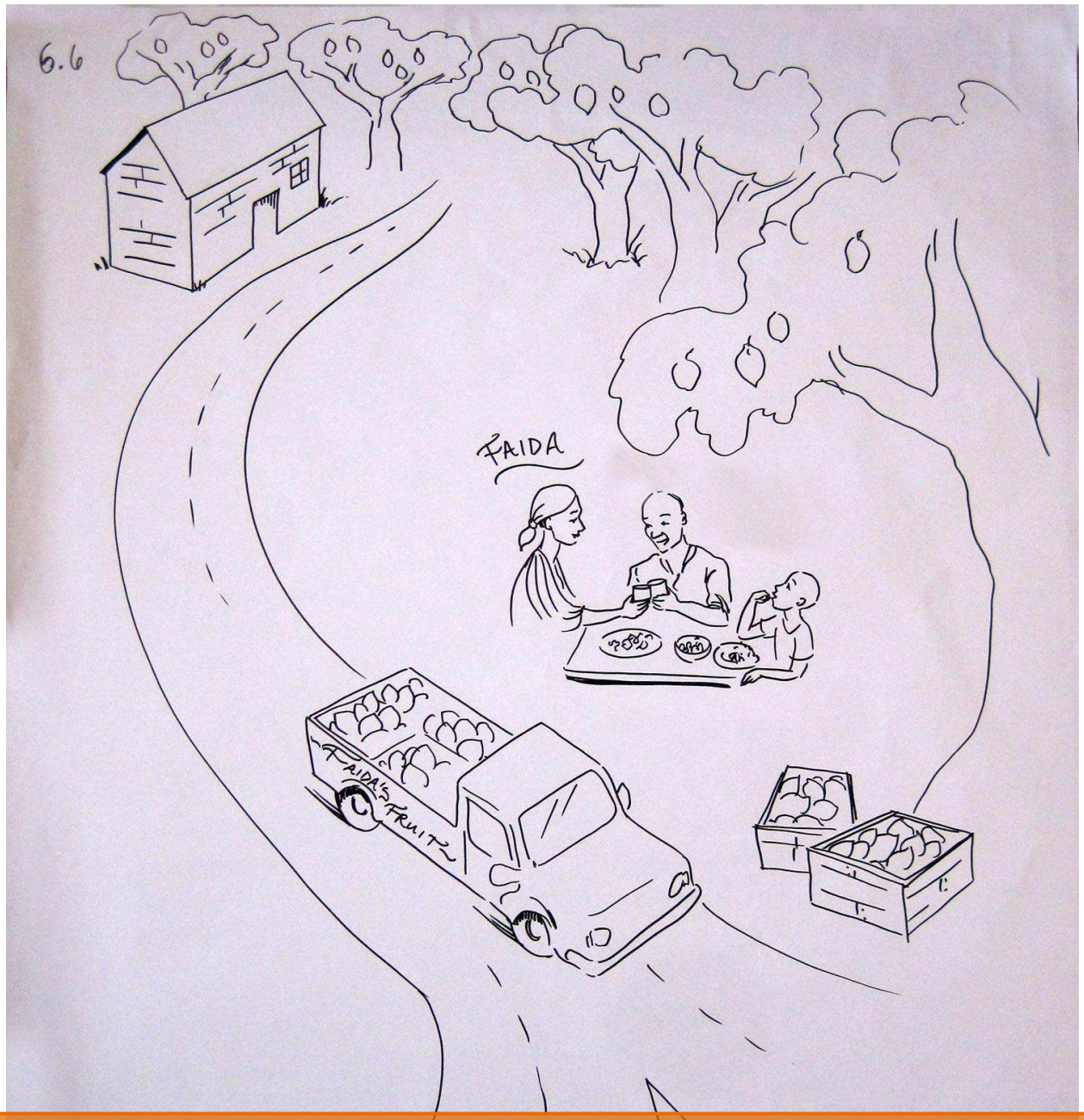
Before the agent left the FBO meeting, she gave Faida a list of contacts for government workers, banks, trainers, and other potential partners. Faida set up an appointment with the government agency that works with certain banks to provide limited-guarantee loans to smallholders, mitigating their risk of investment in tools and technologies for decreasing post harvest loss and increasing yields. Faida worked with a few other farmers to fill out the paperwork and complete their application for a loan so the FBO could purchase the inputs/technologies they needed to effectively run their collection center and source larger amounts of mangoes to the processing company. Because she knew the farmers were going to need to learn how to operate the machinery, Faida also set up appointments with the post harvest technology trainers (extension officers) the agent told her about. The extension officer agreed to set up training sessions at their collection center once a week until each of the farmers felt comfortable operating all the equipment needed to ensure their mangoes met the highest food quality standards.

After one season, the farmers started to see results and felt very encouraged by the processing company agent, who kept in close contact via cellphone and through in-person check-ins. Faida started to wonder how other FBOs could learn about the secondary market opportunities to process their goods as well. She worked with the local radio stations and made signs at roadside stands in her village to let others know about these secondary market opportunities. If only she were able to connect large companies to farmers in the surrounding areas, she could see enormous impacts for her fellow Tanzanians.

Intermediate Achievement

Months had passed and Faida could not stop smiling. Her FBO continued to see growing successes as it became more efficient at growing, aggregating, processing, and storing their mangoes for sale to the large fruit processing company. But they were not just selling to one company; they had different market outlets for different types and different quality mangoes. For instance, their highest quality mangoes would be sold at fresh fruit markets and the remaining mangoes, which still met the food quality standards, were processed at the collection center before transportation to the large processing plants, where they were ultimately packaged into juice boxes.

With the additional market opportunities and more consistent incomes, the farmers were able to start thinking more long-term. They were able to invest in additional technologies for their collection center because they received a loan from the bank through the government program for limited-guarantee loans. And as the FBO continued to grow, selling to large companies and diversifying their market opportunities, the banks became more and more willing to provide loans. As a result, the FBO decided to invest in additional plastic crates for transporting mangoes, nets for catching mangoes from the trees, low-petrol vehicles for transporting mangoes, cold storage rooms for preserving their mangoes, and they even began thinking about investing in the technology to produce dried mangoes as well. Keeping their different consumer groups in mind, the FBO wanted to become the go-to organization for high-quality, reliable mangoes for both fresh fruit markets and for processing. And they were well on their way.



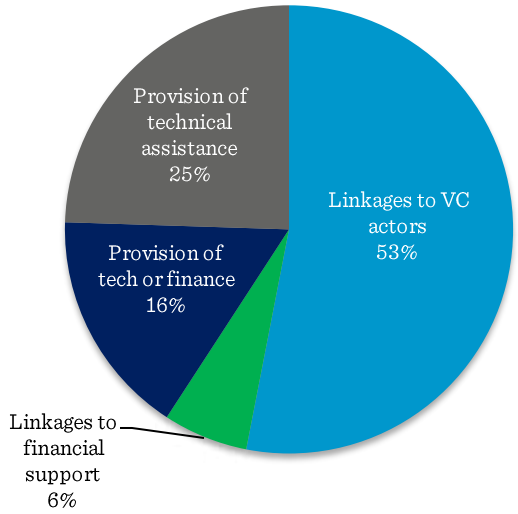
Future Impact

Faida could have never imagined her FBO reaching this level of success. Now, after accomplishing so much together, she couldn't help but imagine what the future might look like a few years down the road. Her children wouldn't be playing near mounds of rotting and unsold mangoes. The neighborhood boys wouldn't be climbing the mango trees anymore; they would be trained how to properly pick and transport the mangoes so as not to damage them. But the boys wouldn't spend all their time helping with mangoes because their families would have enough money to purchase the uniforms needed to send them to school.

Faida could finally imagine a future in which the mango farmers of Tanzania move from 40-60% food loss to almost no food loss. The future was one of food security and prosperity in which farmers were able to make smart, long-term decisions about aggregating their crops, about numerous market opportunities, and about marketing different food products for different consumer groups. Across the country, farmers would be able to coordinate within their FBOs on various secondary market opportunities, and would be able to track the logistics of pick-up and processing with numerous private sector actors. They would be able to market fresh mangoes, dried mangoes, mango juice, and canned mangoes from Iringa to Dar es Salaam to Nairobi and beyond. Faida no longer feared the future, but delighted in its many opportunities.

Evaluation: Perspectives from CC participants on Stories of Future Impact

49 resource offers from CC participants



Resource and Partner Offer Examples

Collaboration Colloquium participants offered resources and partners that they might be able to connect to groups to help solve their challenges. Participants offered this group 49 resources in the evaluation and during the Colloquium itself. Examples include:

Linkages to VC actors:
- Connection to trainers
- Kevian, Coca-Cola, and other buyers

Linkages to finance:
- Industry financial database

Provision of tech or finance:
- Cost-effective post harvest technologies
- Technologies to lengthen shelf-life of produce

Provision of technical assistance:
- Creation of business models
- Manual/information service for aggregation

Each of the specific resource offers made is detailed in a supporting annex that tracks offers to participants.

Scores

Below find scores given to this group by respondents. This Challenge had the second smallest amount of variation between scores, with scores ranging from 3.64 to 4.04. Interestingly, respondents rated the idea as more feasible than innovative, despite the oft-perceived difficulty of organizing alternative purchase arrangements between farmer groups and buyers.

Feasibility: Can the innovation be realized using available or attainable expertise and materials? 4.04 out of 5 (26 respondents)
Desirability: Is the innovation wanted and liked by its main intended beneficiaries/users? 4 out of 5 (26 respondents)
Viability: Is this innovation likely to be financially viable given market supply and demand? 3.76 out of 5 (26 respondents)
Innovativeness: Does the innovation build upon what has already been tried in novel ways? 3.64 out of 5 (26 respondents)

Strengths

Respondents observed the following strengths in this idea:
This innovation mobilizes/focuses on farmers; good focus on secondary markets; would improve markets; would decrease PHL; uses market demand to suggest products; can leverage group dynamics across multiple actors; high potential for scale; good potential for PHL tech

Concerns

Respondents voiced the following concerns about this idea:
Challenges linking farmers & buyers; low-value product/mango is seasonal; scalability/replicability; potential for saturation of markets; requires substantial investment; unclear how this will affect production

Assumptions

Respondents noted that the following assumptions would need to be met for the desired impact to occur:
High volume of product available; aggregation/cooling centers are available; farmers are organized; market information available; strong champion for effort; sales as conceptualized in this idea are stable and profitable

Questions

Respondents asked the following questions, important to moving this idea forward:
How will we match supply & demand? How will this scale? Who will manage aggregation? How do secondary markets grow? How do we ensure partners work well together? How important is the producer organization? How will we ensure standards?

Recommendations

Respondents offered the following recommendations, which they believed would enhance this idea:
Highlight market aspects; improve financial/purchasing linkages; use ICT platforms; need solid infrastructure; private sector should form aggregation system; take on public-private model; train on value addition; identify ways to regulate secondary markets; bring in local government