From One-to-Many

Equipping Rural Micro-Enterprises with Postharvest Technology and Service Packages that Create New Opportunities to Process, Save, and Sell More Food

Bountifield integrated with iDE in 2024. This report portrays Bountifield's experience prior to the integration.

iDE

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A Bountifield International White Paper

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BOUNTIFIELD INTERNATIONAL

Introduction

This paper provides development practitioners, funders, and agricultural equipment suppliers with insights on how the incomes and food security of smallholder producers can be increased by unlocking access to postharvest technology and services. It is based on field experience in Kenya where, over an 18-month period beginning in 2020, Bountifield International is testing new business models for postharvest technology enterprises designed to support smallholder farmers and local food markets.

The paper describes key learnings to-date while highlighting innovative strategies and approaches that can lead to large-scale, positive impact for millions of people. The goal is to stimulate creative, solutions-based thinking and action amongst all stakeholders, leading to greater technology adoption and access, more inclusive value chains, fair returns, and food security for rural farming communities.

An entrepreneur and his farmer client checking out the sorghum crops in her field.

About Bountifield International

Bountifield's vision is an Africa that is self-sufficient in food production and poised to help feed the world. The organization was borne out of and has been a proud partner of General Mills since 1981. For close to 40 years, we have spearheaded small-scale postharvest technology projects in rural communities globally and have increased food security, benefiting over 750,000 people along the way.

Today, the organization is focused on sub-Saharan Africa where we see the greatest need for finally moving smallholder farmers away from the hand hoe and creating more quality-supply in local and national food markets with postharvest technology and services. In the coming decades, we have a goal to positively impact millions of people. This project demonstrates that we believe we have the beginnings of a successful and replicative model to achieve that goal.

Mavuno Bora (Swahili for "better harvest") is a pilot project in Kenya, funded by the van Lengerich family, to develop a proof of concept for an innovative business model that unlocks access to a range of postharvest technologies, primarily for staple crops, and financing for African micro-, small-, and medium-sized enterprises (MSMEs). This project is contributing knowledge and evidence towards Bountifield's overall aspiration. Learnings from this pilot will allow us to capture results and develop our plans to replicate and expand across Kenya and across Africa.

COVER: An entrepreneur poses with her new SL-3 multi-crop thresher.

Context

Understanding The Problem

Smallholder farmers dominate African agriculture. However, they lack access to finance, business and marketing support, and postharvest tools for processing and preserving food, which undermines attempts at sustainable growth.

Current practices for harvesting, processing, and marketing of grains in Kenya lead to high physical and economic losses. Food losses at farm and homestead level, immediately after harvest, are consistently estimated to be more than 10% and sometimes as high as 50%, depending on product and context (FAO, 2019). This is often due to a lack of access to technologies to improve the handling and finishing of the crop, including threshing, winnowing, drying, processing, and storing.

There have been many attempts by development actors to subsidize postharvest technologies for farmers, with few lasting results. Realistically, smallholders have to make individual choices and are unlikely to be able to afford all the machinery required to make farming activities less onerous and more efficient.

Meanwhile, there is a growing market of food buyers and companies who are supplying the national and regional markets. In order for them to be successful, they need stable, quality supply. We believe smallholder farmers can provide a supply to these markets when they are successfully supported by a new cadre of postharvest technology operators in the rural sector.

Bountifield's proposition is that we can reach more farmers by developing rural micro-enterprises as service providers in crop processing and value addition. By doing so, we can create sustainable value chains that supply large numbers of rural households and, at the same time, increase food quality and quantity in local food markets, all the while helping more people improve their livelihoods. We can also incentivize technology suppliers, distributors and crop buyers to invest in these value chains using inclusive business models that benefit all stakeholders.

During this initial period, we seek to answer three overarching questions:

1. **Are farmers willing to pay for postharvest services, such as threshing and drying?**
2. **Is there a viable business opportunity in investing in equipment and providing these services for a fee?**
3. **How can Bountifield unlock financing and co-investment for these operators while incentivizing other actors in the relevant value chains?**

Before embarking on any project activities, Bountifield conducted a product scoping and market study to inform the selection process of the priority crops and the technologies to be tested. Throughout the pilot, rigorous analysis, based on primary and secondary data, has been applied at every step of the decision-making process, from crop and technology selection, to partner engagement and beneficiary targeting.

Bountifield is targeting technologies used by producers of grains (sorghum), legumes (beans, green grams), and roots and tubers (cassava). While we also see potential in the higher value fresh produce and dairy sectors, in this pilot year we opted to focus on these main staples, which are grown by the majority of farmers and consumed by most of the population.

Production and processing of these crops is carried out primarily by women and is done manually, which is labor intensive and time-consuming. Targeted efforts to equip women farmers with productive resources that ease their daily burden in household food preparation is critical. At the same time, village-level aggregation of cereals and legumes is increasingly being taken up by young people on motorbikes, given the daily returns that can be earned, and first-level trading is commonly the domain of women.

Both women and youth are key target groups, for which reducing labor and time, increasing economic empowerment, and tackling food security and nutrition are important goals.

Table 1: Priority Crops Selected for the Bountifield Pilot in Kenya

MAIN CROP	MARKET	POSTHARVEST CHALLENGES	ADVANTAGES	TECHNOLOGY REQUIRED
SORGHUM	Home consumption; breweries; animal feed; flour millers	High losses and poor quality due to manual threshing and milling; inappropriate drying	Market demand; cash and food; drought tolerance	Thresher; Dryer; Milling unit; Mixer
GREEN GRAM (MUNG BEAN)	Home consumption; local market trading; commodities exporters	High losses and breakage due to manual threshing	Market demand; high value; high nutrition; nitrogen-fixing crop	Thresher
MAIZE	Home consumption; local market trading	High losses and poor quality due to manual threshing and shelling, and inappropriate drying; high aflatoxin levels	Highest market demand year-round; potential high earnings when stored	Thresher; Sheller; Dryer
BEANS	Home consumption; local market processing	High losses due to manual threshing losses; lack of sanitary compliance	High nutrition; market demand; easy storage; nitrogen-fixing crop	Thresher
CASSAVA	Home consumption; flour millers; breweries	High losses and market rejection due to discoloration	Drought tolerant; long in-ground storage	Chipper; Dryer; Milling unit; Mixer

OUR THEORY OF CHANGE

Access, affordability, availability, and utilization of postharvest technologies to optimize labor, maintain quality, and reduce losses of food crops will increase the competitiveness, incomes, and food security of smallholder producers in Kenya. With the right technology and business package, MSMEs can meet the postharvest demands of more farmers, and develop their potential in the African technology market.

The theory of change is based on three key assumptions:

1 **Technologies to reduce postharvest losses may be available but their function, efficiency, and cost-effectiveness has not been determined.**

2 **Individual producers cannot afford to purchase the technologies, and finance is difficult to obtain, but they are willing to pay for processing services.**

3 **A new business model is needed that will develop the capacity of small-scale entrepreneurs, incentivize the private sector to invest in them, and enable individual smallholders to use the technologies without incurring the capital cost of purchase.**

Figure 1: Bountifield International Theory of Change

The Bountifield Solution

To address these challenges, Bountifield designed and is testing business models based on collaboration with a small number of "anchor partners" with whom we are cost sharing on small equipment loans to 20 rural "entrepreneurs." These entrepreneurs will provide mechanical threshing services to large numbers of farmers and pay back their loans by charging on a fee-for-service basis. The model is supported by three pillars of technology, technical services, and finance.

Pillar 1

Technology – "The Right Tool for the Right Job"

After selecting the target crops in early 2020, we carried out a detailed scoping and assessment of the main postharvest technologies available in the Kenyan market. To complement in-house expertise with local knowledge, we partnered with Kukua Pamoja, a Kenyan service provider specializing in agricultural equipment, to identify and review various models of the short-listed tools.

The final selection was based on objective evaluation using pre-determined criteria that included specifications, availability, durability, financial viability, cost, servicing, and access to parts. It also included limited field testing and user surveys. We created a technology score card to evaluate and compare postharvest technology already being sold in the Kenyan market.

Table 2: Summary of Pre-Selected Tools

TECHNOLOGY	MAIN CROPS	SPECS	CAPACITY	COST (USD)	SOURCE
THRESHER	Sorghum, millet, maize, beans	MS fabrication, 10HP petrol engine, mobile design, net wt. 105kgs	4-6 MT/day	$1,020	China
DRYER	Cassava, root crops, fruit, vegetables	8x4m plastic tunnel, solar-biomass powered	Up to 3 MT/day for grains	$3,500	Kenya
CHIPPER	Root crops	MS/SS fabrication, 5HP electric motor, mobile design	5-10 MT/day	$650	Kenya
MIXER	All	Food grade SS fabrication, 10HP electric motor	1-1.3MT/day	$3,500	Kenya
ELECTRIC MILL	Cereals	Grid power	3MT/day-grid power	$1,700	Kenya

The technology assessment revealed that a wide range of postharvest equipment is available in country. However, manufacturers' claims regarding factors such as capacity, efficiency, and durability do not always match their functionality and efficiency in the field. Suppliers are not always familiar with the performance of the equipment or the differences between models. They do not readily have access to market information or direct feedback from users to make informed decisions about products, nor do they target various customer segments to understand the performance and quality. Consequently, the selection of equipment on offer is limited, especially for the smaller output models suitable for small-scale operations. Furthermore, the absence of supply chain logistics outside of Nairobi results in lack of availability and distribution in the rural areas where the equipment is needed. This also means that spare parts, maintenance service, and post-sales support tend to be absent in most rural areas.

To address these major gaps in the supply chain, Bountifield is working closely with the private suppliers to provide project entrepreneurs with technical training and post-sales support during the initial months of usage of the equipment. Monthly check-ins allow us to monitor the equipment's performance as well as the practices of the entrepreneur and the progress of the business.

As a long-term intervention, we are also working with manufacturers and importers to promote steady supply, improve transparency and accuracy of information about the machines, and incentivize targeted sales and customer service. As demand for quality postharvest equipment grows, there is a need to develop distribution channels and mechanical capacity through trained technicians closer to farmers.

Technology Performance

Although marketed as universal, multi-crop machines, Bountifield notes that none of the threshers in this pilot achieved the same level of performance on all crops, further complicating access to technology for an average farmer with diverse crop processing needs. For example, to do the job well and maintain the durability and performance of the equipment, a farmer growing maize, beans and sorghum may require three different machines.

ABOVE: The hybrid solar-biomass dryer developed by Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Nairobi.

Pillar 2

Postharvest Services – The "One-to-Many" Approach

Central to the Bountifield approach is the development of entrepreneurial fee-for-service and other aggregation and group-managed business models. These allow one individual or central group unit to provide access to many others. The model enables farmers to enjoy access to labor-saving equipment without the high cost of ownership, while creating a business opportunity and a brand for the service provider who in turn adds rural job opportunities for others who assist in the operation and delivery of the service.

In Bountifield's experience, identifying, evaluating, and selecting these potential micro-enterprises comprised a rigorous process of scouting and in-depth assessment of rural entrepreneurs with the ability to start or increase service provisions to farmers with postharvest technology.

An entrepreneur with a mutli-crop thresher strapped to a motorbike to transport to farmers.

In addition to advertising in local media, we used a targeted approach to MSME recruitment. By tapping into existing networks of agriculture ecosystem actors, such as commodity buyers, industry associations, financial institutions and NGOs, we sought to reduce costs associated with "origination," identify potential co-investment partners, and minimize risk for Bountifield. From an initial pool of more than 100 potential enterprises, a final 20 were selected for the pilot phase.

MSME RECRUITMENT	INITIAL EVALUATION	CAPACITY ASSESSMENT	FINAL SELECTION
Targeted approach for additionality; to minimize risk	Review against pre-determined criteria to assess fit	Business case validation & due diligence process; capacity gaps identified	Verification visits to each enterprise
105 enterprises	40 enterprises	23 enterprises	20 enterprises

Figure 2: MSME Recruitment & Selection Process

The MSME capacity assessments carried out by local expert consultants working with Bountifield highlighted areas of significant gaps, particularly in financial analysis and management, marketing techniques, and business growth strategy. These will be addressed by Bountifield's "Business in a Box" which provides a trusted brand in technology selection and deployment, augmented with training and mentoring to successfully manage a business.

Intensive training in the form of a group "boot camp" is reinforced by continuous coaching tailored to the needs and capacity of each enterprise, delivered through regular contact with the entrepreneurs by Bountifield's team, and the Kukua Pamoja technicians who are monitoring the use and performance of the equipment.

TOP: The entrepreneurs are active participants in group training sessions.

BOTTOM: An engineer from Kakua Pamoja gives technical demonstrations & training during group "boot camps."

Commercial Threshing Service Provider: The Economic Case

A service provider could expect net profit, after expenses, of $2,450 USD per annum. At a cost of $1,250 for the thresher, the service provider could expect to fully recover the cost of the equipment and have a net increase of $1,200 from the first season (within 30 days).

Table 3

Commercial Service Seasonal Projecion (USD*)		
Revenue	3,600	
Total Revenue	3,600	100%
Expenses		
Labor (exclusing owner)	720	20%
Fuel	144	4%
Maintenance	100	3%
Transport	180	5%
Total Expenses	1,144	32%
Net Proft	2,456	
Equipment Costs	1,250	68%
Cash Flow Excess / (shortage)	1,206	

**Exchange rate = 100*

Table 4

Commercial Service Seasonal Assumptions		
Average bags per day		48
Number of days		30
Farm locations/day		3
Total bags		**1,440**
Cost per bag	USD*	2.50
Labor per bag	USD	0.50
Fuel per bag	USD	0.10
Transport per day	USD	2.00

**Exchange rate = 100*

Pillar 3

Financing – Priority Access for the Missing Middle

Although the majority of Africa's population is involved in agricultural activities, less than 1% of commercial lending goes to the agriculture sector (FAO, 2018). Consequently, most of the credit that farmers and agri-MSMEs receive comes informally through value chain actors, such as input suppliers and commodity buyers, primarily for seeds, fertilizers, and other production related supplies (ISF, 2016).

Financing for small-scale postharvest equipment is negligible. Bountifield's third pillar addresses this serious gap by using a smart subsidy to raise co-investment from three types of anchor partners who have shared interests, both developmental and commercial.

Our approach was based on three assumptions.

1 **The small amounts of money required to purchase postharvest tools, generally less than $5,000 per borrower, are available in rural economies from non-bank sources.**

2 **Potential investors with access to these funds, both private and public, have not been presented in the past with a viable business proposition for investment in postharvest technologies and services.**

3 **If presented with a business plan which is technically feasible and financially viable, they will be willing to invest.**

The goal in this pilot stage is to demonstrate proof of concept, spark interest, and catalyze new investment in postharvest equipment that will stimulate investment by a wider range of both formal and informal credit providers in the future. In every case, we have engaged strategic anchor partners to co-fund up to 50% of the cost of the equipment deployed to the entrepreneurs, who have committed to repay the full cost of the equipment they have requested. In turn, the entrepreneurs will aim to earn fees from the farmers whose grain they thresh that will be sufficient to meet the repayment terms of their loan and provide a net profit.

In this first year, we are testing models with three types of anchor partner in order to compare success factors, learn more about which business models can work, and identify the specific challenges that need to be resolved.

1. Private Sector Companies

We are partnering with two commodity buyers, who can benefit by helping producers improve the quality of their grain through better postharvest handling practices. By investing in demonstrably cost-effective technologies and supplying associated services, they can strengthen the farmer relationship and ensure more reliable supplies of higher quality grains. This can be done directly by investing in new equipment for their own use or through lending to aggregators who supply them. Since these companies are aiming to recover the total cost of equipment against an outlay of only 50%, they can potentially re-lend to more aggregators in the future and grow the business for themselves, the aggregators, and the farmers on a sustainable basis.

2. NGOs

We are co-lending with two NGOs that provide productivity-enhancing training and other capacity support to farmers and micro-entrepreneurs. In this new approach with Bountifield, they are supplying equipment to selected entrepreneurs who, in turn, will contribute in-kind services to farmers that will accelerate the social impacts of the NGOs and the development projects funding them. The entrepreneurs will operate a fee-for-service model that will allow them to raise funds and supply more equipment in the future without the need for financial assistance from the NGO.

3. Microfinance Institution (MFI)

We are working with the savings and loan enterprise of a farmer association – Savings and Credit Cooperative (SACCO) – to co-finance loans to MSMEs providing services to their members and others. The SACCO is already financially sustainable, and, through this partnership, they will add a completely new service and technology, based on the Bountifield business model.

These five anchor partners are representative of many thousands of MSMEs, NGOs and projects, and SACCO/MFIs present in Kenya and across Africa that can potentially adopt the one-to-many approach.

LEFT: An entrepreneur visits a farmer in the field to assess his field of green grams.

Table 5: Bountifield's Technology Financing Models

ANCHOR PARTNER	COST-SHARE CONTRIBUTION	MICRO-ENTERPRISE	TERMS
Commodity buyer	50%	Village-level aggregator	100% repayable over 2 seasons
NGO	50% + in-kind contribution by recipient	Entrepreneur; Agrodealer; Farmer Coop/Group	Non-repayable; social return
MFI	50% + fees	Aggregator; Entrepreneur; Agrodealer	100% repayable + interest over 2 seasons

Although the three finance models differ in detail, they are similar in principle. In addition to addressing the financing gap in the short-term, Bountifield's business model aims to achieve long-term sustainability by integrating repayment terms as a condition for the beneficiary partner wherever possible. In addition to this condition, neither Bountifield nor the anchor partner risk an outlay of more than 50%.

The recipient of the equipment – the borrower – agrees to pay back the full cost of the tool. This enables the anchor partner, also responsible for collecting the payment, to "revolve" the funds, including Bountifield's 50% contribution, to another borrower. Essentially, Bountifield is building a technology investment fund that can continue to help others access otherwise inaccessible equipment.

Delivery and demonstration of the MT-500 multi-crop thresher

The Bountifield Business Model

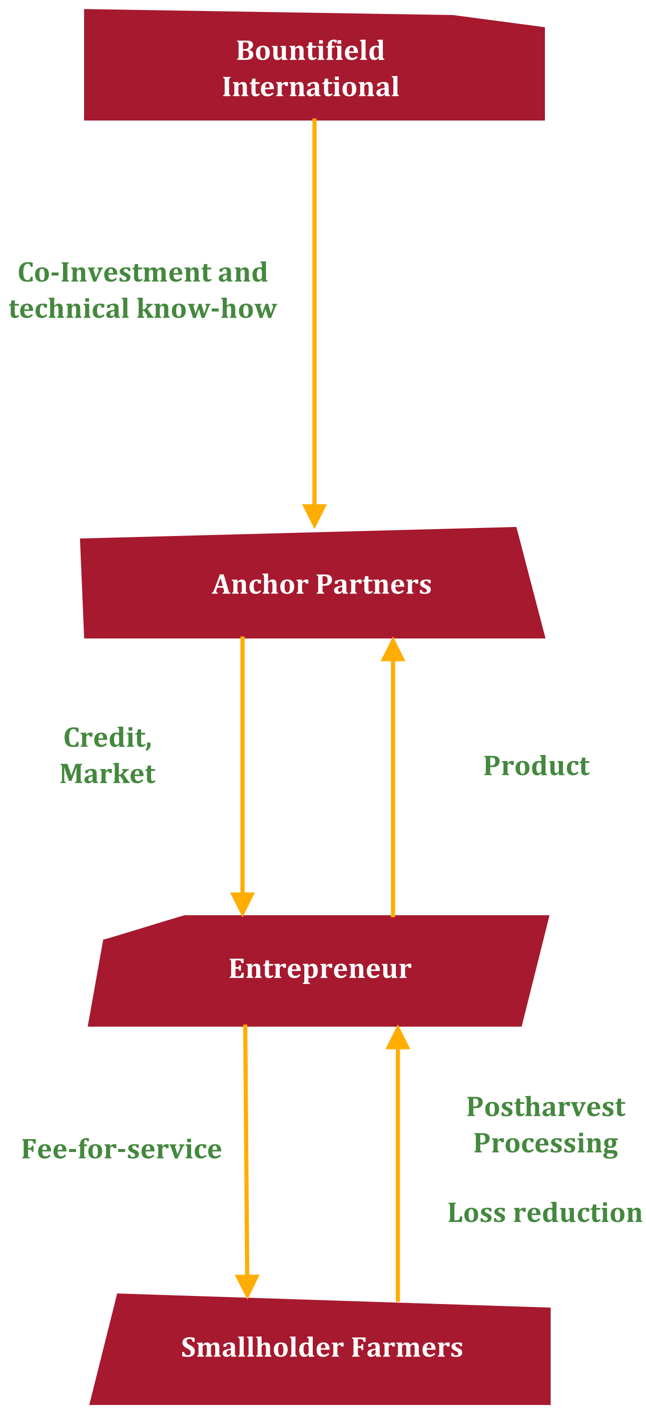

Figure 3: The Bountifield business model

We recognize that NGO partners typically lack accounting mechanisms and the necessary infrastructure to recover funds from beneficiaries and project partners. However, we have included these in our pilot for the purposes of testing various approaches. Leveraging existing funds from development actors toward technology adoption and access for smallholder farmers contributes to Bountifield's overall objectives, serves as demonstration, and provides an important social return on investment, even if it requires replenishment using donor funds.

Furthermore, by charging a fee-for-service, even though they have no financial stake, the entrepreneurs receiving NGO funds will be testing a potentially profitable business that they can adopt in future without the need for grant support.

Open-air drying of cassava reduces quality by increasing the risk of exposure to harmful molds and aflatoxins. Improved drying technologies will help MSME's to not only decrease processing time, but to deliver a higher quality product to their clients.

Early Success Factors

FINANCE

Our approach to finance has been to tap into public and private partners who had funds available but minimal expertise or ideas on the potential gains, social or financial, to be made by investing in postharvest technology. By working with them to develop low-risk cost-sharing models we have been able to leverage two times our investment in loans to 20 entrepreneurs who themselves are investing an equivalent amount.

ONE-TO-MANY APPROACH

The assumption that a one-to-many approach could provide a commercial opportunity for investors, as well as benefit smallholder farmers in terms of food security, has been proven by the willingness of several small-scale trader/processors and farmer groups to pay for tools tested and approved by Bountifield. They have clearly demonstrated their awareness of the potential advantages in terms of increased production and incomes that can result from technology adoption and have become active partners in the project.

A thresher operator hired by one of the entrepreneurs presents the processed sorghum.

DIVERSE PARTNERSHIPS

It has become clear that the creation of diverse partnerships where each partner has a role that plays to their institutional strength and experience is an effective and inclusive way to mitigate risk and build confidence. For example, in the case of one private sector anchor partner who paid 50% of the cost of equipment upfront, the company is able to focus solely on sourcing and trading, which is its strength. Equipment procurement and testing is done by the aggregators with training done by the supplier/manufacturer or specialist consultants provided by development partners. The selection of different types of enterprises and sources of co-funding provides many opportunities for comparison that will contribute to defining what factors contribute to overall success.

TECHNOLOGY SCREENING

Despite unforeseen disruptions caused by COVID-19, the project is already achieving some significant success towards defining the business model(s) and some aspects of the pilot are working well. For example, technology screening to determine the fit-for-purpose and cost-effectiveness of the equipment is almost unique to the Bountifield approach. While many development organizations and projects promote agricultural technologies, there is no indication that these are selected based on their suitability for the targeted user. All of our anchor partners have expressed surprise and welcomed the level of scrutiny and effort taken to assess the various technologies before deployment as well as to provide the necessary technical support and training that is lacking. This has also boosted the confidence of the operators – the entrepreneurs – who were provided with detailed information about the different machines and given the opportunity to select the model they preferred.

Early Challenges

In addition to COVID-related delays, the project has encountered several other logistical and technical obstacles which, to a large extent, mirror the challenges and point to the reasons that technology adoption levels in Africa, including Kenya, are generally low.

WEAK LOCAL MANUFACTURING CAPACITY

There is no significant investment in the manufacture of farming or postharvest equipment in Kenya that is suitable for small-scale operators, despite the massive potential market. The few manufacturers that exist produce low-quality equipment and have minimal awareness of the need or have no incentive to provide sales-related training or post-sales service. Wide variation in quality, price and commercial viability of different tools is endemic.

LACK OF KNOWLEDGE

Suppliers of agricultural equipment generally only buy to fulfill orders and do not follow up much after sales have been made. As a result, they develop little knowledge or experience in particular technologies and cannot give advice to buyers who are often farmers, government programs, or NGOs with no in-house knowledge of their own criteria to apply, are not very selective, and do not always know their machines.

LACK OF CONSISTENCY

There is no consistency in the models, delivery or quality of imported equipment. Imports are generally price driven and mainly from China or India with no obvious criteria other than price for selection of products. Commercial supply chains for imported technologies barely exist so each procurement tends to be a one-off event and subject to many hold-ups and logistical complications. A good example is the importation of so-called “multi-crop” grain threshers and shellers that, in practice, only work effectively for one crop.

RIGHT: Without access to postharvest processing technologies, farmers process sorghum through labor intensive and time consuming manual methods.

Lessons Learned

- **Both private sector companies and NGOs see value** in co-investing in postharvest technologies and services. They have responded positively to Bountifield's approach and our proposed business model for the one-to-many provision of postharvest services to small-scale farmers.

- **We have been able to leverage both private sector** and development funds for co-investment. Cost-sharing on equipment has provided significant leverage with partners.

- **NGOs share impact objectives and have ready** access to project funds to invest at the relatively low level required for our model.

- **Private sector buyers see value in co-investing** in their aggregators to increase supply. However, they are hesitant to provide loans to suppliers because of potential side-selling risks by borrowers to avoid loan repayment. Equipment suppliers are equally risk-averse, one expressed interest but only if loan repayment was 100% guaranteed by Bountifield, in case of default.

- **Unfortunately, expectations on ''giveaways" is still** high among potential private sector anchor partners and entrepreneurs, leading to prolonged negotiation. Equipment purchase and donations by government initiatives or donor projects also distort markets and disrupt equipment supply chains.

- **Supply chains for equipment from Asia and Latin** America are often delayed or unreliable. Importers have limited knowledge of products and offer no post-sales services. Local manufacturers mostly lack quality control and precision tool-making equipment, potentially exposing farmers and investors to risks from malfunctioning or unsafe use. Equipment specifications can be inaccurate, for example so-called multi-crop threshers may only work satisfactorily for one crop.

- **Bountifield's expertise and commitment to test and** approve the functionality of equipment has emerged as a unique and much appreciated factor in adoption of the business model. Feedback from partners and beneficiaries indicates that development projects usually purchase and distribute tools to farmers without conducting the requisite assessments of the suitability and performance of the technology and lack the technical capacity to train recipients in the use of machines for optimum performance. A technology and service package that provides training and assurance of technical support creates confidence and has proven to be an essential part of the business model.

- **The success of the model depends on** the availability of a reliable market for the crops being processed. A holistic approach to the market system that takes into account risks such as major buyers withdrawing orders for the target crops would add strength to the business offer.

- **Investors need to be flexible in terms of** their selection of anchor partners and entrepreneurs since rural economies are subject to constant change and unexpected risks. Unavailability of promised funds or their diversion to other activities at short notice is common, so it is essential to have a pipeline of potential partners and entrepreneurs.

- **Above all, a holistic approach is needed to** continuously improve the business model in ways that increase the resilience of MSMEs to deal with shocks including market flux, farmer changes in crop preferences, and natural disasters such as COVID-19 which disrupted local markets and supply chains significantly this year. The unpredictable effects of climate change in relation to seasonality and rainfall levels will require a patient approach over several years to develop a sustainable model.

Looking Ahead

What Questions Remain?

Results to date indicate that the pilot business model has great potential but it will take a longer period and the inclusion of many more anchor partners, SME beneficiaries, and technology packages to reach the level of understanding and momentum needed to achieve scale. Key questions remain.

SCALE

A parameter that we are assessing in relation to scale and commercial opportunities is the number of farmers that can access services versus how many can own a machine. If we add 1,000 or 10,000 new entrepreneurs with a suite of technologies, will the model be sustained? We will have data by the end of the pilot to know if entrepreneurs are paying back their equipment loans, and if the anchor partners are revolving the funds, as envisioned.

ADDITIONALITY

Would this model of purchasing equipment for an aggregator to offer for hire happen without Bountifield intervening? Bountifield's value-add is the focus on postharvest business development for MSMEs. Our program offers technical know-how, willingness to deal with suppliers, placement and post-sales support, a strong brand for entrepreneurs, and partnerships in financing. It also offers an equipment assurance process leading to selection of quality tools and trust in the equipment.

These are some of the questions we will explore in the second publication of this white paper series, due out in Q1 2021.

SUSTAINABILITY

If the co-investment subsidy is removed, will the value chain actors and financing partners continue? How can Bountifield sustain itself with this model? We are exploring a "Technology Investment Fund" structure, which would enable Bountifield to produce financial returns on the credit being extended. Another option is a licensing fee for the technical expertise and use of the "Bountifield Approved" label. This would be accompanied by a platform where subscribers can access reviews and technical briefs on a number of technologies that have been evaluated and recommended by Bountifield.

RIGHT: An MSME with the SL-3 multi-crop thresher.

Annex

Annex 1: Bountifield's Kenya Pilot Technology Deployment List

ENTERPRISE	ANCHOR PARTNER (TYPE)	CATEGORY	FARMER POOL (#)	TOOL
1	MFI	Fee-for-service	1,000	Multi-thresher (SL-3)
2	MFI	Fee-for-service	500	Multi-thresher (MT-500)
3	MFI	Fee-for-service	500	Multi-thresher (MT-500)
4	NGO	Fee-for-service	640	Multi-thresher (SL-3)
5	NGO	Fee-for-service	7,000	Multi-thresher (SL-3)
6	NGO	Fee-for-service	500	Multi-thresher (SL-3)
7	NGO	Fee-for-service	3,200	Multi-thresher (SL-3)
8	NGO	Farmer Group shared use w/fee	400	Hybrid Solar-Biomass Dryer
9	NGO	Fee-for-service	3,000	Multi-thresher (SL-03)
10	Buyer	Farmer Group shared use w/fee	3,262	Multi-thresher (SL-3)
11	Buyer	Farmer Group shared use w/fee	1,200	Multi-thresher (SL-3)
12	MFI	Fee-for-service	3,200	Multi-thresher (MT-500)
13	Buyer	Fee-for-service	7,200	Multi-thresher (SL-3)
14	MFI	Fee-for-service	3,200	Multi-thresher (SL-3)
15	NGO	Farmer Group shared use w/fee	3,326	Hybrid Solar-Biomass Dryer
16	NGO	Farmer Group shared use w/fee	615	Hybrid Solar-Biomass Dryer
17	NGO	Farmer Group shared use w/fee	336	Hybrid Solar-Biomass Dryer
18	Buyer	Fee-for-service	3,000	Multi-thresher (SL-3)
19	Buyer	Fee-for-service	1,900	Multi-thresher (SL-3)
Total potential farmers served			**43,799**	

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Expanding fee-for-service businesses also creates more job opportunities as entrepreneurs hire employees such as thresher operators to support their operations.

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