POST-HARVEST FOOD PROCESSING OPPORTUNITIES AND CHALLENGES FOR RURAL SMALLHOLDER FARMERS IN TANZANIA

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<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRIBUSINESS BACKGROUND</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>U.S. Assistance to Tanzania</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>LARGE SCALE COMMERCIAL</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SMALL SCALE COMMERCIAL</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>VILLAGE</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PROJECT BACKGROUND</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>AGRIBUSINESS CONSTRAINTS</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>CAPITAL INVESTMENT</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>PRODUCTION FACILITY</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>INFORMATION ASYMMETRY</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>MIDDLE MEN VALUE THEFT</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>RAW SUPPLY AND QUALITY</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>COMMUNITY BUY-IN</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>SUSTAINABILITY</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>STANDARDS, REGULATIONS, AND LEGALITY</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>OPPORTUNITIES</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>ACCESS TO INFORMATION</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>CREATE LINKS BETWEEN FARMERS AND PROCESSORS</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>MINIMIZE COST OF PRODUCTION</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>QUALITY CONTROL</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>INSIGHTS</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>ELIMINATING MIDDLEMEN</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>POST-HARVEST GRAIN LOSS</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>RECOMMENDATIONS</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>EDUCATION INITIATIVES</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>RAW PRODUCT TRANSPORTATION</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>OTHER KEY FINDINGS</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>MULTI-CROP INCOME/OFF-SEASON</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>APPENDIX</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>1 ROOT CAUSES FOR MIDDLEMEN</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>2 CROP LIFE CYCLE</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>3 FOOD PRODUCTION FACILITY PERMITS AND REGULATIONS</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>4 SUMMARY OF GROCER PRICES FOR FOOD PRODUCTS IN TANZANIA</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>5 MEETING NOTES</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>HAPA</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>SINGIDA FRESH OIL MILL</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>YAZA SUNFLOWER OIL PROCESSING (HALISI)</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>MOUNT MERU OIL MILLERS</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>
MASASI FOOD INDUSTRIES/ LULU 49
AVOMERU 51
BRAZAFRIC 53
GRAIN POST-HARVEST LOSS PREVENTION A HELVETAS PROJECT 55
SMALL INDUSTRIES DEVELOPMENT ORGANIZATION (SIDO) ARUSHA OFFICE 59
UNGA WA UWELE FLOUR MILL, ARUSHA SIDO COMPLEX 60
SANLITA PRODUCTS, ARUSHA SIDO COMPLEX 62
SWEDTAN MEAT PROCESSORS, ARUSHA SIDO COMPLEX 63
SMALL INDUSTRIES DEVELOPMENT ORGANIZATION (SIDO) DODOMA OFFICE 65
BAHATI/MABIBO MARKET MEETING 66
NATURAL EXTRACTS INDUSTRIES 67

WORKS CITED 70
Agribusiness Background

Agriculture is Tanzania’s largest industry and the country is Africa’s largest importer. Agriculture makes up 40% of Tanzania’s gross domestic product and 85% of exports. Over 80% of the population works in agriculture in some part of the supply chain—as a farmer with animals or crops, a transporter, a processor, a buyer, or a seller. Cashew nuts are Tanzania’s biggest cash crop, followed by coffee, tea, cotton, sisal, and cloves. On the import side, industrial raw materials, consumer goods, machinery and transportation equipment, and crude oil are all essential imports for Tanzania’s sustainability in agriculture.

One of the biggest challenges in many of Tanzania’s industries is fighting corruption. The current president, John Magufuli, has made part of his agenda to urge a new age of prosperity within Tanzania. Corruption within the government has allowed some agribusinesses to flourish faster than others.

U.S. Assistance to Tanzania

The United States has played a major role in helping Tanzania improve its stability and economy, as they work to improve health conditions, food security and nutrition, sustainable development, and energy.¹ The United States has also established educational programs that encourage Tanzanians to become more educated and develop their talents such as the Fulbright Program, Hubert Humphrey Fellowship, and Young African Leaders Initiative.² These programs help to provide opportunities for education, a vital starting point for improving the conditions in Tanzania.

Traditionally, Tanzania has been a big exporter of consumer goods and agricultural raw materials, and an importer of processed goods. To establish a more stable economy in Tanzania, the country needs help to continue to develop more efficient and modern technologies to help their farmers and local tradesmen produce higher quality and quantity of goods for use within Tanzania. By employing more Tanzanians in the agricultural process and producing goods to be sold within Tanzania, inhabitants of rural villages will be better equipped to serve their communities. Per the U.S. Department of State, “Tanzania is eligible for preferential trade benefits under the African Growth and Opportunity Act. The United States has a Trade and Investment Framework Agreement with a regional organization to which Tanzania belongs – the East African Community.”³

² Ibid.
³ Ibid.
Large-Scale Commercial
Large-scale food processing facilities in Tanzania are not plentiful. The facilities that have grown to such a scale do not necessarily have similar-scale competitors. Large-scale processors have dominated the supermarkets and have the most access to customers and farmers. Their networks make them powerhouses, and it is difficult for small-scale commercial facilities to compete with them. Often what makes large-scale commercial processors so successful and vast is that they are part of a larger conglomerate, like Mt. Meru, that owns gas stations and transportation fleets, among other businesses. Their scale provides them with financial stability that would otherwise be a challenge for small-scale or village-level enterprises.

Small-Scale Commercial
Smaller processing enterprises often have a more personal connection with farmers, as both parties significantly depend on each other for success and profitability. Rural farmers often grow more than one crop to rotate their soil as well as extract as much income as possible from various buyers. Often small-scale facilities will also buy a secondary crop to supplement their business’ income during times of the year when their main product is not as widely available. For example, a vanilla extract producer may buy as much vanilla as is available, and turn to coffee beans during the off-season for extraction. Small-scale facilities will also buy seeds for farmers to plant and then buy their crop from them in a cycle. It has not been common for the small processing facilities to own their own land for farming, but some have future goals to expand with that capability.

Village
Rural villages in Tanzania do not have prominent processing facilities with intentions of selling outside of the community. Village-scale processing does not show significant signs of success, as many communities do not have the resources to sustain operations. A major drawback for villages is lack of education and knowledge about machinery or processing. Often a village processing facility will shut down because there is no one to tend to broken machinery or continue the daily tasks.

Common choices for village-scale processing are milk and dairy products, especially in Maasai communities. Others may try to extract raw material from vanilla, coffee, or sunflowers, but they do not have the capability to operate on a steady basis.

A more common agricultural practice in villages is farming for small- and large-scale processing facilities. Even though property ownership is complicated based on region and traditions, many villagers have access to a vast amount of land to grow crops and raise livestock. Tanzanian farmers often raise cattle, chickens, goats, and donkeys to sustain their families and communities. In addition, depending on the region of Tanzania, Farmers will grow sunflowers (Singida), vanilla beans, coffee beans, avocados, bananas, wheat, and maize. Often the crops are used as shade trees for other crops to grow and are not a primary crop. This is a window of
opportunity for both farmers and processors to utilize these secondary crops and turn them into more profit.
Project Background

The Global Water Institute’s (GWI) Sustainable Village Water Systems Program is a multi-faceted initiative aimed at making measurable, far-reaching progress toward water and food security in Tanzania. To ensure the success and sustainability of such systems, regional economic activities must be cultivated to drive development and sustain income-generating activities among rural communities.

Historically, opportunities for sustaining wells, health education, and access to clean water have been thwarted because of lack of education and income in Tanzania. To have more successful sustainable village water systems, GWI realizes the potential for additional projects that can impact the lives of Tanzanians. By considering ways to increase the income of Tanzanians, GWI foresees the potential to capitalize on the resources that are already so prevalent in the country.

Tanzania has struggled with creating income for its inhabitants. Because agriculture is a significant part of the country’s economic and social structure, there are several opportunities that are available to better utilize Tanzania’s resources. With agriculture as a focal point in Tanzania, the team was tasked with researching and understanding the viability of food processing in rural villages. In addition, it was important to create a network of contacts to establish a connection within the Tanzanian agricultural industry. Before the in-country research and observations, the team took steps to understand different scales and transferability of food processing between products as well as the fundamental resources needed for sustainability.

The team visited the Ohio State University College of Food, Agricultural, and Environmental Sciences’ food processing facility to gain a better understanding of the processes. While this facility was much more advanced than what a village could possibly sustain, it was helpful to see how their facility operates. The team used this experience to understand what type of technologies might be necessary for sustainability in-country.

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Approach

After our initial understanding of the task of analyzing food processing business models that would be viable options for a collection of smallholder farmers to increase their personal income, we began with secondary research. This research came from several sources: NGO websites, Tanzanian economic reports, scholarly articles, and news articles. Through this early research, we began to develop an understanding of the Tanzanian economy, specifically the agricultural industry. Also, we started to determine the challenges faced in different stages of agricultural production, organizations and business models that have failed over the years and why, and companies that have remained successful over time.

This secondary research was adequate to get a basic understanding of agricultural business models currently in operation throughout Tanzania, but was limited to specific regions. Our next step was to conduct interviews with contacts in Tanzania via telephone and Skype to cross-reference the information we had obtained. This was a key step to further deepen our knowledge of business models and pain points. From these interviews, we were better able to assess potential in-country visits that would provide further benefit to our research and end recommendation.

From our contacts, we scheduled in-country meetings and facility site visits, and explored potential future meeting options once we established our presence in Tanzania. From these meetings, we were better able to evaluate attributes of successful organizations and their true benefit to smallholder farmers. The true benefit of these in person meetings was the first-hand knowledge we gained in determining the limited transferability of adequate production facilities to the small village level.

The final step in our process was to spend time in small villages to gain a better understanding of village-level society in order to better offer realistic recommendations. Comparing what we had learned about potential agribusiness models and then assessing their viability from a village-level perspective allowed us to better understand the difficulty in providing effective food processing capabilities to rural villages throughout Tanzania.
Agribusiness Constraints

Capital Investment
A major constraint that a collection of smallholder farmers would have when attempting to develop a processing facility to integrate forward and retain more value from their crops would be the initial capital investment required to construct a facility. This financial constraint is exacerbated when trying to construct a facility that meets the Tanzanian national standards and regulations that would allow for packaged food products capable of legal sale and distribution throughout Tanzania and the export markets. We have learned, through word of mouth, of small groups of farmers that share small-scale processing equipment, such as a manual oil press or grain miller, but this equipment is not capable of producing substantial volumes of products and is often just for individual home use. Furthermore, if farmers are using some equipment to further process their crops for sale, it can only be sold or traded at local, unregulated markets since their products are not branded or registered with the Tanzanian Food and Drug Authority.

In meeting with privately held companies and social enterprises, initial financial investment has been a topic that most believe to be a preventative factor to small holder farmers. For example, a representative from Natural Extracts Industries stated that their capital investment came from various foreign aid groups, and they continuously try to receive further funding money since they are currently not profitable. However, they were only able to obtain this funding due to their overall social mission of increased wealth for individual farmers. One counter to this foreign aid necessity is Yaza Sunflower Oil, where the founder, Yusef, invested his own personal savings, obtained private loans from Tanzanian banks, and sought out additional domestic investors. With smallholder farmers already in a continuous struggle with personal cash flow, the ability for them to obtain capital investment to further refine their products to retain more value is severely limiting.

One organization that claims they assist with providing financing options for smallholder farmers that we were unable to meet with is TechnoServe5. This organization provides an opportunity for GWI to learn more about the systems and risks involved with smallholder financing that could produce the capital needed for a functioning processing facility.

Production Facility
In addition to the difficulty of securing the substantial capital investment needed to establish any processing facility, there is also the constraint of obtaining adequate equipment needed for proper storage and production. Furthermore, the continued struggle to implement reliable water systems and electricity imposes limitations across the country, even with recent substantial improvements by the government. To produce sales volumes necessary for

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profitability, the need for automated processing instead of manual equipment is a necessity, especially for legal commercial sale.

**Information Asymmetry**
An area of important interest to the GAP team was the lack of information that the smallholder farmers have in regards to selling, pricing, and modern farm practices. From our village-level interaction, we learned that providing adequate information to farmers at the village level seems to be an easy and cost effective means for value retention at the individual level. Our two-day village visit to Orkesumet and Terrat with Lukas provided insights that the farmers within these areas do not know current pricing for their crops at major city markets nor have the personal means to transport their crops. Even though current agricultural product pricing can be found through mobile applications, such as M-Farm⁶ or Habari Mazao⁷, most Tanzanian farmers do not use these resources and remain unaware of the accurate market value of their agricultural products.

Disseminating accurate information at the village level is a first-step approach to ensure that smallholder farmers receive fair value for their agricultural products. Lukas is currently working on a community radio, that is currently in use throughout other regions in Tanzania, to educate farmers, which seems like a viable opportunity to reach a large number of citizens with minimal investment. Furthermore, community radio only requires a simple radio, which most citizens who utilize solar already own, per individual farmer.

Another opportunity that the GAP team asked about was posting a community bulletin board, which could be easily seen by a high percentage of citizens at local churches. At the villages we visited, no such system is currently in use, but was regarded as a potentially good idea. We were unable to decipher why a community bulletin board was not in use, but this may be another simple solution for information dissemination.

**Middlemen and Value Theft**
The lack of knowledge among smallholder farmers and their inability to transport agricultural goods over long distances has created the opportunity for middlemen to enter the market and take value away from individual farmers. While the presence of middlemen is somewhat illegal, especially when they purchase crops from farmers that received subsidized seedlings and training from other producers, it is currently too difficult to regulate their existence across Tanzania.

These middlemen often come with large trucks right after the harvest, promising to pay current market prices, which is rarely the truth. Often, at the point of harvest, farmers are already

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cash-constrained and will take any price that a middle man offers just to have a little money to survive. Through information gained from several interviews, there is also a high percentage of farmers who sell to middlemen right after harvest when prices are the lowest since that is what they have always traditionally done.

Natural Extracts Industries and Yaza Sunflower Oil try to mitigate the value theft of middlemen by offering several collection points throughout their farmer areas so that no farmer must travel far to sell their crops. Furthermore, these companies pay cash at point of purchase, so there is no lag time between transfer of goods and payment. Being accessible to farmers and providing immediate, fair payment seems to be the only way to reduce the threat of middlemen, but even with these company initiatives, the presence of middlemen is extensive in certain remote areas and among certain crop harvest cycles.

**Raw Supply and Quality**
A key takeaway from meetings with the Sunflower Oil Producers in Singida; Yaza, Singida Fresh, and Mount Meru, was that there is currently not enough supply of raw agricultural products to meet demand. With several producers attempting to buy the raw product from a limited number of farmers, many are only able to operate their facilities and produce oil for part of the year. Furthermore, the low quality of the supply available is a constant issue. This quality issue has caused many producers to develop field teams and supply fresh seeds to farmers annually to ensure quality.

Supply constraints were also a major issue for Natural Extracts Industries as they are currently only capable of meeting 10% of their current vanilla extract demand. With supply constraints limiting their profitability, Natural Extracts believes that being able to grow their farmer network exponentially is the only way to match supply with demand and begin to become profitable and sustainable.

Field monitor teams or field agents are a growing trend among agribusiness companies to ensure a consistent quality product. Also, as some companies attempt to market their products as “natural” or “organic,” the monitoring of their farmers’ practices is essential to meet international standards. This is especially important for companies looking to export their products.

**Community Buy-In**
When addressing small-scale, village-level processing capabilities, the political and social dynamics are complex and need to be fully understood before any major project can be undertaken. We learned from GWI about water projects that were rejected by villages since

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they interfered with the social characteristics of the village, which is a threat to any project at the village level.

Several different “groups” exist within each village. During our time visiting Orkesumet and Terrat, we had to meet with local district government, village elders, regional pastors, and the local women’s groups to make them aware of our presence in their community as well as inform them of the purpose for our visit. Each of these groups seemed to have different issues in their village that they viewed as priorities, which had the potential to create conflicting goals. Balancing these cultural dynamics is a complicated process and something that requires continued interaction with the community to become fully immersed in their thinking and goals. Having a local villager who has experience articulating the local relationships to foreign groups would be ideal as most villagers cannot describe their regional complexity in a manner that can be easily understood by westerners.

Sustainability
For an agribusiness to be sustainable, it must be efficient and profitable, which from our interaction is difficult for Tanzanian companies. With many businesses operating as social enterprises, foreign aid is often the source of their operating budgets, and profitability is still years away. These social enterprises must continuously apply for funding through various foreign organizations or risk collapse of their operations.

For example, Natural Extracts Industries stated that they were currently not profitable and need additional funding to produce the growth necessary to reach profitability. Mount Meru Sunflower Oil, a private company, is currently not generating enough revenue to cover their operating costs. Without profitability, these organizations collapse when foreign or governmental funding is exhausted.

Developing a business model from inception based on private investment or that has a pre-set exit strategy from foreign funding gives the greatest chance of sustainability. By working with organizations focused on improving availability of private banks loans, such as the African Foundation for Development9, Tanzanian citizens will have increased access to private financing and thus greater incentive for success and profitability.

Standards, Regulations, and Legality
Another major constraint that needs to be addressed is the legal aspects in dealing with the production and sale of processed agricultural products. There are numerous government organizations such as the Tanzanian Food and Drug Authority10 for product registration and

10 "TFDA.” Tanzania Food and Drugs Authority. N.p., n.d. Web.
production permits, OSHA\textsuperscript{11} for production facility safety inspections and permits, and Tanzanian Revenue Authority\textsuperscript{12} for tax collection. Organizations must either employ a knowledgeable manager or hire consultants who are familiar with these national standards to prevent fines and shut-downs.

\textsuperscript{11} “OSHA.” Occupational Safety and Health Authority. N.p., n.d. Web.
\textsuperscript{12} Tanzania Revenue Authority, http://www.tra.go.tz/
Opportunities

Access to Information

One of the main issues in rural villages for small farmers is having the right information and accessibility. Lack of information has led to the loss of value capture for farmers in the current value chain. By raising awareness about ways to increase farmers’ incomes, they can be better prepared to sell their crops in the right market. It is important for farmers to have updated and useful information for different stages of crop life, plus post-harvest tips and market prices for local crops in the region and nearby areas.

For farmers to receive the right information, there need to be accessible channels. Some of those channels that were found in villages are public places, radio, and community leaders. Within public spaces, church bulletin boards and community spaces can be a place where large groups of villagers can gain information and be educated on technology, agriculture, and other newsworthy announcements. Radio stations allow communities to broadcast content to surrounding communities with immediate access and deliver information that can be beneficial for more than just one group of people. They can offer educational briefings, market pricing, and other opportunities for income. Finally, a community leader can be a key influencer in the village with the advantage of a wide network across other villages, as well as a foundation of trust among local community members.

Create Links Between Farmers and Processors

The long-established network and knack of middlemen in the market has been the barrier for both sides—farmers and food processors—to capture value. Some food processors, like sunflower oil producers in Singida, have put their efforts into launching contract farming schemes to ensure stable access to high quality feedstocks. They are looking for a solution to get enough quality sources for their input, and to be less dependent on the seasonality of crops as well as the price manipulation of middlemen. Another of their efforts is to invest in buying land and establishing their own farms using selected seeds and growing methods that meet ISO standards. However, this initiative would help them meet just part of their supply. To expand production and reach 100% capacity, they would need to establish supply relationships with several big farmers across the region. Therefore, building trust and setting up stable links between farms and factories will be the sustainable solution for both farmers and food processors.

Minimize Cost of Production

The low income level of mass consumers in Tanzania is the key barrier to their spending money on processed food products. However, the cost of production at small and medium food processors, which include imported packaging materials, low machine utility, floating prices of raw materials due to seasonality, and middle-man issues, keeps them from lowering prices to a level that mass consumers can afford. Soon, food processors plan to implement cost-saving
projects: for example, Masasi who is working on a new tomato sauce formula or cheaper bottle packaging to introduce low-cost products, or Yaza’s efforts to provide quality seeds and training for farmers around their factory to stabilize sourcing.

Quality Control
Among tomato processors, there are two leading companies that are in the process of obtaining ISO22000 certification for their products as the ticket to export to neighboring countries: Darsh Industries and Masasi Food Industries. Doing business within the domestic market seems to be much easier for most food processors, whose products have not been tested or qualified by professional organizations such as TBS or ISO. However, the export market is a promising opportunity that would potentially offer higher profitability. Long-term planning across the food processor’s value chain tied to the strict standards for food industries is the critical factor to ensure quality control of the final products.
Insights

Eliminating Middlemen

GWI walked the GAP team through the process that brokers or middlemen use to capture an unfair amount of value within the agricultural value chain during our first meeting. While in-country, we found that everyone we asked—including farmers, food processors, government officials, and neutral 3rd parties—agreed that middlemen capture an unfortunate amount of value, and this is hindering the development of the Tanzanian agribusiness sector. In the US, distributors achieve single-digit profit margins as they interact between producers, manufacturers, importers, and retailers. In the agricultural sector, cooperatives have been the primary enabling entity ensuring that farmers receive a higher portion of the value of their crops than their Tanzanian counterparts. Unfortunately, in East Africa, cooperatives have been an abject failure. Although they exist, they only exist in the presence of an external forcing function, be that a NGO, buyer, or government body, and they always collapse once the external entity separates itself from the cooperative. Roger Bird, founder of CoolCapFund, told us that if the team found a cooperative in Tanzania that functioned without an external mandate, the GAP team would need to stay in that location and study the governance of the cooperative, because we would all win a Nobel Prize.

Given the total failure of cooperatives in Tanzania, another solution is needed for small farmers to combat the power of middlemen. GWI proposed that the GAP team review the feasibility of small farmers being provided small food processing equipment to gain the upper hand against middlemen, but this proposal is overly complicated, likely to fail for reasons addressed in other sections of this paper, expensive, will be slow to scale, exacerbates the already-low utilization of Tanzanian industry, and does not address root cause reasons for farmers interacting with middlemen. Both Nina Nchimbi (Regional Manager, Arusha SIDO) and Lugendo Msegu (Program Manager, Grain Post-Harvest Loss Prevention Project (GPLP)) agreed to three root causes why farmers sell to middlemen and walked the GAP team through strategies that have proven to work in helping farmers flip the balance of power in their favor. (Appendix 1a)

The first root cause of farmers selling to middlemen is bullying and intimidation, which will likely be the most difficult root cause to solve, but also appears to be the least prevalent. In certain regions, the farmers, thanks to the explosion of mobile phones, have market knowledge of what 100 kg bags of grain sell for in large markets or at processor sites. Furthermore, they can transport grain to markets themselves, albeit slowly and in small quantities. Therefore, they are unlikely to sell to middlemen at depressed prices. This has forced some middlemen out of the business, but others have chosen to seek out farmers at night and threaten them to scare them into selling their harvests, like how the mafia in the US would get someone to pay back debts if they were behind. Unfortunately, prosecution is the only solution to this, which the police seem disinterested or incapable of doing. Neighborhood watches could discourage
middlemen from entering towns and farmers’ homes, while ensuring families have access to mobile phones with cameras could allow them to capture faces or license plate and vehicle information from offenders.

The second root cause of farmers selling to middlemen is simple pragmatism. Farmers want to send their children to school which costs money, family members get sick which costs money, things break which costs money, etc. No farmer will forgo meeting an immediate family need if they have harvested crops available for sale regardless of what they think about middlemen or future needs. Fortunately, Helvetas has pioneered a scalable technique to overcome these simple difficulties: partnering micro-finance institutions with farmers to meet their immediate cash flow needs, while the harvest is locked in storage to be sold when prices rise. This is effectively an extremely unique take on first world warehouse receipt systems (WRS).

Here are the steps in the process:

1. The farmer harvests their crop.
2. The farmer takes their harvest to the micro-finance WRS control point.
3. The farmer and the micro-finance agent lock the harvest in the control point. They use a double-lock container so that both the farmer and the micro-finance institute must agree on the time of sale. The storage container needs to be airtight to preserve the harvest, whether that is via PICS bags or an airtight metal silo.
4. The micro-finance agent pays the farmer for the harvest at current prices. This payment become the principal value of the loan. Contract signed.
5. Prices rise as the harvest concludes and food processors need more supplies to maintain optimal utilization.
6. The farmer and the micro-finance institute agree to sell the harvest when prices are high.
7. The farmer repays their loan principal and accrued interest (usually 20% to 22%) to the micro-finance institute, while the farmer maintains the remaining money (usually 50% to 100% of the loan principle amount).
8. The farmer provides a better lifestyle for their family.

Helvetas stated that signing farmers up for this system was not a problem, and this model does have ancillary benefits that are worthwhile. First and foremost, there is no better teacher than experience. This model educates more individuals more quickly on how micro-finance and formal lending processes work than any radio program or school instruction can. As farmers gain comfortability with micro-finance processes and procedures, they will have increased
likelihood of seeking out micro-loans for other needs or wants, which will further increase the standard of living of rural households. Secondly, this provides the scale needed for micro-finance institutions to expand into villages that formerly did not have the loan demand to support a micro-finance office. By adding scale through harvest loans, other types of credit will open to rural villages. Lastly, the harvest loan system will be most prevalent in only a couple of months each year. After the agents recover from the peak period they will need something to do to increase loan volume, hit performance targets, and get promoted within the organization. The only option available to them would be to work within the village to increase small business loans and increase the volume of other products, which will result in a higher standard of living for the residents of the village.

**Post-Harvest Grain Loss**

A significant issue affecting rural farmers is the loss of grain post-harvest (note: for the purposes of this section sunflower seeds will be considered a grain, because sunflower farmers experience the same issues as grain farmers). Estimates on the total harvest lost during activities after the harvest but prior to the delivery to food processors vary widely due to differences in the crops being analyzed and the regions and years in which measurements were captured, however, all estimates generally range from 15% to 40% of the total small farmer harvest being lost post-harvest. If rural farmers could be taught techniques to reduce their postharvest loss from 30% to 15%, this would increase the value of their harvests by more than 20%.

There are many causes for the loss of grain post-harvest. The following is a summary of causes of loss:

- Manual processes are common; even animal power is not used. Hand processing causes more loss than mechanical processing. Example: removing corn kernels from the corn ear.
- Delayed harvest causes loss.
- Transportation in wooden carts creates loss as grains fall out of the cart over the side or through holes between boards.
- Drying after harvest is not 100% efficient as it is completed on the ground. Animals eat it, kids run through it, and it blows away, causing loss. The GAP team witnessed each of these, although we were not able to capture pictures.

![Picture 1: Sunflower seed drying with a lot off the tarp.](image)
• Local granaries do not preserve grain well. Pests and fungus cause loss as does the weight of grains stored at the top of the storage container pressing on the grain at the bottom.

• Chemicals such as acetic acid, commonly used to help preserve grain, are applied incorrectly, causing loss. Dosages and application techniques are frequently incorrect. For example, acetic acid needs to be reapplied after three months and almost never is.

In most cases the cause of loss is either not tangible to farmers or is caused by something that farmers don’t know how to avoid. This is dually the challenge and opportunity that training and resourcing farmers on post-harvest loss presents.

The Grain Post-harvest Loss Prevention (GPLP) project, a Helvetas project, is the only known major initiative in Tanzania to attempt to tackle reducing post-harvest loss in Tanzania. The pilot was started in 2013 and deemed successful in 2014, allowing GPLP to proceed with their Phase I project beginning in November 2014. Phase I’s expected conclusion is October 2017. Phase I takes place in four regions: Dodoma, Manyara, Morogoro, and Shinyanga. Each region has two focus districts and each district has nine focus wards. In Phase I, GPLP had three objectives:

1. Increase storage capacity of small farmers.
2. Ensure market-based storage solutions are implemented.
3. Showcase improvement in post-harvest policies and outcomes.

Implementation of the delivery of solutions and/or activities that would positively impact the three outcomes occurred in five “clusters.” Each cluster is essentially a set of related activities influencing specific stakeholders at specific times of the project’s delivery. Below is a summary of the five clusters:

- **Coordination and advocacy through multi-stakeholder platforms.** Ensured partners at each level of government were informed and signed off on what the project was doing and who it was impacting.

- **Awareness raising, communication, and farmers training.** Targeted specifically at the farmers and stakeholders who could and would influence the activities of farmers in a way that benefited farmers. The information blitz used printed media, radio, town parties with exhibitions and/or speakers, and cars with loudspeakers to education people in the targeted villages. A very important point is that generally the training offered is not implemented during the season that it is provided to the area, but it generally is implemented by the local farmers during the following season.
Manufacturing of quality silos and other Post Harvest Technologies (PHT). The fundamental push was to get farmers to use hermetic storage technologies that can keep damage from insects and fungus to a minimum. There were three technologies pushed as a part of this cluster:

Purdue Improved Crop Storage Bags – double nylon bags with Ziploc-like seals that prevent external oxygen from interacting with grain inside the bag. These bags generally last for three seasons and are not resistant to animals like mice or dogs. PPTL in Tanga and Agroside in Arusha are the vendors GPLP used, but the GAP team saw them at the TFA store in Arusha. The TFA quoted a price of 5000tsh per bag, but stated they would give a quantity discount. The polypropylene bags generally used were found to cost between 1000tsh to 1500tsh during market visits.

GPLP-designed metal silos – These silos can last for 20 years, and GPLP has designs for 250kg, 500kg, 1000kg and 2000kg versions. These silos are not centrally produced, as they dent easily, but GPLP could easily train local tinsmiths in their fabrication. This had the added benefit of encouraging development of artisan trades in small villages and resulted in more money staying within the village rather than going outside the district or even overseas.

Blue plastic barrels – These airtight plastic barrels can be seen in much of GPLP’s marketing material, and were intended to be an intermediate step from PICS bags to metal silos. However, they never took, and the few that were handed out the farmers were quickly converted to use for water rather than for grain. We do not recommend trying to implement these barrels.

Access to financial services to buy/produce PHTs. Usually farmers start out using PICS bags due to cost considerations, but as incomes rise and micro-finance becomes increasingly available, farmers upgrade to metal silos. Access to financial services also applies to the tinsmiths who will need access to working capital from the time the silo is ordered until it is delivered and payment made.
Action research, monitoring and learning. GPLP actively had a project officer responsible for capturing lessons learned, and they had a third party conducting audits of prior project sites to ensure internal biases were not affecting the capture and documentation of lessons learned and best practices.

The outcomes of the GPLP project were extraordinary. For a total investment of $4.24M, 215 trainers and champion farmers trained over 30,000 farmers on improved post-harvest management techniques. A phenomenal 92% of trained farmers eventually adopted improved practices causing 25,000 PICS bags and more than 1,000 metal silos to be purchased less than 25 months after the start of Phase I. The demand generated by the 1,000 metal silos resulted in 81 local artisans reaching out to GPLP for training on how to construct them for local farmers.

Phase II will be finalized in either late-2017 or early-2018, however GPLP and Helvetas understand they don’t have the financial capacity to ‘go-big’ with this project. Therefore, they are setting up the GPLP program office as a consultancy for other organizations who want to adopt all or portions of the GPLP project in regions not targeted by Phase I. GPLP mentioned already partnering with three or four organizations and each is slightly tinkering with the model to see if they can achieve superior results. For example, one of the organizations is subsidizing the purchase of the metal silos to speed adoption and injecting capital into local businesses.
Recommendations

With the ultimate goal of increasing smallholder farmer household income in rural Tanzania in mind, the idea of developing shared processing facilities within villages was deemed an area for the GAP team to assess by GWI. The thought was that a co-op style food processing facility would allow rural farmers to retain more value for their agricultural inputs by investing resources in refining their crops into salable end products, thus commanding a higher price in the marketplace.

After initial assessment of food production operations, it was clear that some dimension of the existing business models seemed to be working well and could be transferred to small village-level food processing operations. However, once we could better assess the current economic and cultural state of small villages in rural Tanzania through our village visits, the difficulty in establishing any shared production facility was quickly realized. Furthermore, our doubts on the potential success of village-level production facilities was echoed by owners and management of private business and social enterprises within the agricultural processing sector based on the previously described constraints and challenges.

A major limiting factor to small villages (< 5000 inhabitants) would be their ability to obtain and stay current with proper food processing permits, product registration, export permits, safety regulations, and proper taxation requirements. Any food processing facility would need management staff educated in these regulations to be able to set up the facility according to standards, maintain those standards, and troubleshoot as needed to prevent shut-down and lost income for extended periods of time.

Small-scale production is possible, examples being a shared milling machine and raw sunflower oil pressing, but these products can only be sold or traded at local "farmer’s markets" and do not follow any regulations or standards in production. Furthermore, spoilage and contamination were found to be major issues that create a barrier to entry for small-scale producers. These types of products may provide extra income for a household but cannot be sold in legitimate businesses and thus command a lower price than they would in more regulated markets. (Appendix 4)

Taking into account the limitations placed on the opportunity to develop village-level shared processing facilities, we have made other recommendations that GWI should consider to increase the individual income of smallholder farmers in rural Tanzania.

Education Initiatives

A priority that GWI should undertake to increase the household income of smallholder farmers is to develop initiatives to educate farmers on accurate fair market prices for their agricultural products.
Community Radio & Bulletin Board. Farmers selling their harvest to middlemen is what Nina Nchimbi termed “cultural conditioning.” It is the situation where they simply do not know any better, likely as a result of seeing their parents, neighbors, and friends all selling at the time of the harvest, never considering that there are other options available to them. Resolving this situation involves deliberate education through workshops, radio, printed media, village parties, and other outreach efforts. It is important to note that radio has been attempted before with mixed success, however the key difference between then and now is the explosion of single-home solar systems which often come with a radio. Therefore, the number of people in the target audience with access to radio has effectively gone from zero to sizable. Not all members of the target audience need to own a radio, they only need to frequently interact with those who do, since stories about how farmers can increase their income will create a “buzz.”

When the GAP team asked our sponsors in Orkesumet why they did not post prices for common grains in the two or three closest markets, our sponsors looked at us like they had never considered such a thing. Something as simple as signage in a common area with pricing information will start a buzz within town, causing information to reach most of the town. This would give farmers the knowledge that prices fluctuate throughout the year, and the knowledge to try to squeeze more money out of middlemen should they have to sell to them.

Loss prevention. Once full analysis of target villages is complete, GWI should enter into an agreement whereby Helvetas GPLP acts as the consulting partner on the program that GWI has decided best fits their goals. GPLP believes they have proven out their model, however they do not have the financial capital to expand throughout Tanzania, much less East Africa, with their solution set. Therefore, they have concluded that their most effective role is that of advocacy with Tanzanian stakeholders and consultancy to external entities wishing to launch similar programs while shortening the learning curve for new programs.

GPLP mentioned that they are currently acting as the implementation consultancy for three or four other parties who are taking their material to areas not targeted by the Helvetas project. GPLP seems to have no pride of ownership in their solution and seem to be interested in their clients tinkering with their model to see if they can achieve superior results or if they can prove that certain models work better in different areas. One specific example mentioned was another party subsidizing the purchase of GPLP’s metal silos to speed the adoption of longer-term storage solutions from polypropylene or PICS bags (double walled nylon bags). Lastly, GPLP mentioned that they do not know of either the farmer education or micro-finance approach being attempted in the Singida region, so that area should be wide open for GWI. In the Dodoma and Manyara regions, GPLP’s programs targeted around 33% of residents.

GWI could partner with several institutions within Big Ten schools that are leaders in the field of post-harvest loss prevention. Purdue University was the developer of the PICS bags, and the
Program Manager for the PICS project is Ms. Carole Braund, cbraund@purdue.edu or 765-496-0385. Further, Dr. Prasanta Kalita is the Director of the Archer Daniels Midland (ADM) Institute for the Prevention of Postharvest Loss at the University of Illinois at Urbana-Champaign. The ADM Institute for Prevention of Postharvest Loss hosted a Coursera course on the topic of postharvest loss in 2017.

GWI should reach out to GPLP and initiate discussions regarding what a pilot in Singida region may look like, with GPLP being the technical advisor for GWI. This project could be quickly piloted and is easily scalable, so it is very realistic that a GWI-sponsored Phase I could be launched in less than 12 months from the start of the pilot. The sites for the GWI-GPLP project could easily overlap the 125 to 150 sites that the water project is being tested at.

Alterations of the Helvetas project GWI that could review include giving each farmer two to three PICS bags after their training or subsidizing a portion of the cost of a metal silo. Further, GWI could include demonstrations of other complementary products such as the Basic Utility Vehicle, drip irrigation, improved seed varieties, and mechanical shelling/threshing technologies alongside the GPLP exhibits.

**Raw Product Transportation**

*Shared trucks.* The existence of middlemen has been sustained over time partly due to the fact rural farmers do not have access to adequate transportation to get their raw agricultural products to markets where they can be sold for their full value. Instead, the distance between rural farms and major markets requires smallholder farmers to either hire some form of transport for their goods, or sell their goods to a buyer who comes to their village. As previously described, this cuts into the full value farmers can sell their goods for, sometimes requiring them to sell at a substantial discount.

GWI can either provide rural villages with large trucks that a collection of farmers can share to deliver their crops to market when needed or partner with organizations already providing some form of transport. Purchasing large vehicles would require that the village maintain a team of citizens who could drive the vehicle and provide general maintenance as needed. There would also be the need to stay current on any permits and insurance on an annual basis. Finally, each villager who uses the vehicle would have to pay small fees to cover fuel, but these expenses would be far less than the full cost of hired transport.

*Official Producer Contracts.* Several organizations that we met with in country, such as Yaza Sunflower Oil and Natural Extracts, send teams of buyers out to rural villages to buy whatever products they need at market price, less a small fee for transport, directly from the smallholder farmers. This creates no need for farmers to find their own transport, yet they are still guaranteed maximum value for their raw agricultural products, since they are selling directly to reputable food processors. We cannot guarantee that all food processors will provide a fair
price to these farmers, but GWI can undertake an initiative to link smallholder farmers and food processors via contracts with set prices.
Other Key Findings

Multi-Crop Income/Off-Season

*Intercropping.* As farmers try to use their land mainly for subsistence living, they tend to focus on a select group of crops based on their regional climate and growing seasons. Intercropping offers farmers the ability to expand their income by increasing their land utilization while still not decimating the soil’s health. Common intercropping combinations are maize and beans or vanilla and banana trees. These plants complement each other well based on their growing needs and allows for additional income with little variable cost.

GWI can work with organizations that are currently educating farmers on intercropping techniques, such as One Acre Fund\(^\text{13}\). By educating farmers on the intercropping potential the agricultural output from Tanzanian farmers will increase, potentially lifting the entire industry. Several companies that we met with while in Tanzania noted that there is simply not enough supply of quality agricultural products available in Tanzania for processing finished commercial goods, for both domestic and export sale. Increasing overall supply, while also focusing on niche agricultural products, such as vanilla, should lead to increased income for the agricultural industry, and thus smallholder farmers.

*BUV Partnership.* Basic Utility Vehicle, Ltd. is a small business located in the Small Industries Development Organization site in Arusha, Tanzania. The business is the brainchild of a Tanzanian resident, Byron Borden, who was born in the United States, but moved to Kenya with his family at the age of four. Minus a seven-year excursion to Portugal, Borden has lived in East Africa all his life. He worked in the East African aid industry for over 20 years and concluded that aid does not work, but witnessed enterprise work where it was not interfered with by donors.

Borden has partnered with the Institute for Affordable Transportation (IAT) in developing and manufacturing Basic Utility Vehicles in Tanzania and has some sales across East Africa. The BUV’s selling point is that the vehicle is constructed with only characteristics required for rural people living in disconnected or nearly disconnected East African villages. Any other luxury is stripped out. This has resulted in a low-cost hauling vehicle that is capable of traveling 20 km per liter (47 miles per gallon) of diesel. Given this capability, Borden has witnessed most customers going from making $60 to $70 per month to $60 per day. Despite the incredible benefits, he has had difficulty selling BUVs. He attributes this to being committed to the workshop full-time, as he has had to work out the operational kinks of training and supervising his staff. This has resulted in no sales strategy or sales effort, other than a website and brochures.

\(^{13}\) https://www.oneacrefund.org/uploads/all-files/Report_Ag_Innovations_Intercropping_FINAL.pdf
The GAP team feels that partnering with BUV could be a low-cost quick win for GWI. Discussions with a food processing equipment supplier, BRAZ-AFRIC, revealed that almost all of their sales come from people who attend demonstrations that they routinely hold around Tanzania. The demonstration approach is also used by BRAZ-AFRIC in Uganda and Kenya as well. If GWI could support BUV with one or two sales staff this could be a win for GWI, rural villages, and BUV. Furthermore, as the BUVs are manufactured in Arusha, this would support the development of skilled trades in Tanzania, and support the growth of local supply chains as demand for materials used in BUV construction would create an anchor buyer, increasing economies of scale that other businesses could leverage for growth.

We suggest a model where the GWI-supported sales staff spend 50% of their time targeting areas that Borden determines present a good opportunity, and the other 50% targeting villages on GWI’s priority lists. The benefits to Borden’s company would be immense, as right now he is planning on personally tackling the marketing issue to include conducting demonstrations. Also, he is not a native-born East African, so potential customers and local government officials could confuse him with someone working for an aid organization and believe that the BUVs should be provided free of charge. This would provide a substantial income boost to one member of the community, however the benefits of making transportation available to the community could help support the entire community.

We believe that the benefits of increasing the availability of transportation in rural villages can provide value to the village and not just the service provider. Currently, logistics service providers—like crop brokers—are not from the villages that they serve, so they are incentivized to seek the highest profit possible at the expense of their customers. If a logistics service provider is located within the village, they are incentivized to always return to the village hauling something, even if only to pay for the fuel required to return to the village. This will increase the availability of products within the village, and likely depress prices by removing scarcity of products demanded within the village that the current logistics service providers are not incentivized to haul. Secondly, the driver will return with information. Information could be in the form of what buyers are paying for goods at company X compared to company Y. Information could be knowledge about affordable technologies that the driver has seen used elsewhere, such as solar electricity. Information could be in the form of pitching villagers to purchase fertilizer or other inputs that might increase their income. A further benefit would be marketing by the driver to increase his workload, but, since he lives in the village, he would be on the hook for any idea he ‘sells’ that does not pan out as expected. Lastly, this could help connect rural villagers with legitimate buyers and help them not feel forced to use brokers now that they have a driver who lives in their community and is more trustworthy.

The GAP team feels that the investment GWI would be required make if this opportunity were pursued would be minimal. A high estimate of the cost of a salaried salesperson would be
$20,000/year for their salary and potentially another $10,000/year for expenses. It would be advisable for GWI to only donate a portion of the salary and not get involved in expenses, so Borden is solely on the hook for any abuse of recouping expenses that could occur.

The GAP team did not present this idea to Borden, so we do not know how open he would be to it, other than his comment that a sales and marketing effort is his biggest pain point. This seemed like an opportunity to potentially get a quick win with a local company that could have very positive outcomes for BUV, Ltd., Arusha craftsman, individuals purchasing Basic Utility Vehicles, and disconnected rural villages.
# Appendix

## 1 Root Causes for Middlemen

<table>
<thead>
<tr>
<th>Root Cause for Small Tanzanian Farmers Selling to Middlemen</th>
<th>Response Actions</th>
<th>Location the GAP Team Found the Root Cause Prevalent In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullying and Intimidation of Farmers</td>
<td>• Increased Policing</td>
<td>Arusha, Moshi</td>
</tr>
<tr>
<td></td>
<td>• Neighborhood Watch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mobile Phone Penetration for Pictures and Rapid Reporting</td>
<td></td>
</tr>
<tr>
<td>Pragmatic Cash Needs (kids school bills, medical situation, etc.)</td>
<td>• WRS in collaboration with microfinance</td>
<td>Dodoma</td>
</tr>
<tr>
<td>“Cultural Conditioning” – I sell at the time of the harvest because that is what my parents did</td>
<td>• Education:</td>
<td>Orkesumet in Manyara Region</td>
</tr>
<tr>
<td></td>
<td>• Short Term – Community boards listing the price of grains in nearby markets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Long Term – Community Radio, deliberately planned training or community themed parties</td>
<td></td>
</tr>
</tbody>
</table>
## Crop Life Cycle

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Seeding</th>
<th>Planting</th>
<th>Growing</th>
<th>Harvesting</th>
<th>Farmer Processing</th>
<th>Storage</th>
<th>Transportation</th>
<th>Industry Processing</th>
<th>Route to market</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Spillage - Lack of Education - Cash flow cause immediate sales</td>
<td>- Middlemen bully farmers, holdup and manipulate prices to farmers/processors - Speculation on grain futures is rampant</td>
<td>- Low utilization - High production cost - High cost/long process of getting quality certification: ISO - High working capital required - Insufficient infrastructure (poor road condition, power cut)</td>
<td>- Mass consumers cannot afford food processed products due to low income. - Small food processors cannot rely on distributors/wholesalers to market their products to stores. - Quality certification required for exporting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### What Has Failed

**Giving Farmers Seed**
- They sold immediately
- Processors can’t enforce Front Product Agreements

**Giving Farmers Mechanical equipment**
- No I&M Farmers buying mechanical equipment - Poor Quality

**Giving Farmers Anything Free**
- Giving Farmers Anything Free Farmers buying mechanical equipment - Poor Quality

### What Has Proven to Work Most of the Time

**Education - WRS w/micro-finance**

**Siloage - PICS Bags**
- Cold storage for perishable crops (avocado from TAHA Fresh project)

**Exporting Avocados (Africado and Rungwe Avocado Company)**
- TAHA hotline to inform farmers the market prices of crops in nearby regions

**Organize small farmers to clusters, and link those to food processors to eliminate middle men (TAHA projects)**
- Food processors is recruiting distributors to acquire big volume to increase utility (Masasi with Lulu brands)

### What Hasn't Been Tried

**Vendor Financing**
- Vendor Financing
- Education farmers on alternative transportation options

**Contract farming in medium scale (Yaza is working with farmers around their factory in Singida)**

**SIDO offer centralized processing center so that farmers can bring their crops to process and negotiate selling prices with buyers**

**- Silage - PICS Bags**
- Cold storage for perishable crops (avocado from TAHA Fresh project)

**- Exporting Avocados (Africado and Rungwe Avocado Company)**
- TAHA hotline to inform farmers the market prices of crops in nearby regions

**- Organize small farmers to clusters, and link those to food processors to eliminate middle men (TAHA projects)**
- Food processors is recruiting distributors to acquire big volume to increase utility (Masasi with Lulu brands)**
3 Food Production Facility Permits and Regulations

*Tanzania Food and Drug Authority*: regulates the quality, safety, and efficacy of food
http://www.tfda.or.tz/index/
- Pre-packed food product registration (one time) TZS 40,000
- Food production registration (annual) USD 10
- New processing facility inspection fee (one time)
  - Large Scale = TZS 150,000
  - Medium Scale = TZS 150,000
  - Small Scale = TZS 75,000
- Export food permit TZS 50,000
- Food selling outlet permit (annual) TZS 30,000
- Health certificate TZS 20,000

*Occupational Safety and Health Authority Tanzania*: Aimed at improving the health and well-being of workers and of workplaces by inspecting occupational safety and health practices to prevent workplace injury and disease.
http://www.osha.go.tz/
- First aid inspections (annual)
- Fire extinguisher inspections (annual)
- Fire escape plan proof (annual)
- Fire hazard inspections (annual)
- Processing facility employee health assessments (every 6 months)

*Tanzania Revenue Authority*: responsible for administration and collection of various taxes of the Tanzania central government
http://www.tra.go.tz/
- Taxation
- Export documentation
4 Summary of Grocer Prices for Food Products in Tanzania

Name: Unnamed Shop in Arusha's Central Market
Description: Well stocked store in the Central Market. They seemed to have a wide range of non-perishable items such as condiments, tea, coffee, edible oils, flour, baking soda, soap, toothpaste, and laundry detergent. They also had some non-food products such as sandals. There was a mixture of products from India, Malaysia, Tanzania and other East African countries. The GAP team did not notice anything made in western countries. Competing with sunflower oil was vegetable oil, corn oil, and olive oils. Competing with Red Gold were two different types of tomato pastes each priced about 1,000 tsh more (American Garden from UAE, and a Kenyan brand). We were in this store while being harassed by the touts so we were not able to conduct as thorough of an analysis as at the other stores in Arusha. When asked if the store carried raw sunflower oil the worker gave a very puzzled look and responded with "No, never."
Summary of prices observed on 8 May 2017:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price (tsh)</th>
<th>Place of Origin (if known)</th>
<th>Manufacturing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Gold Tomato Paste Products (250g)</td>
<td>1,000</td>
<td>Arusha, Tanzania</td>
<td>Darsh Industries</td>
</tr>
<tr>
<td>Red Gold Tomato Paste Products (880g)</td>
<td>2,000 – 2,500</td>
<td>Arusha, Tanzania</td>
<td>Darsh Industries</td>
</tr>
<tr>
<td>Singida Sunflower Oil (3L)</td>
<td>14,000</td>
<td>Singida, Tanzania</td>
<td>Singida Oil Mills</td>
</tr>
<tr>
<td>Singida Fresh Sunflower Oil (3L)</td>
<td>14,000</td>
<td>Singida, Tanzania</td>
<td>Singida Fresh Oil Mills</td>
</tr>
<tr>
<td>Sunola Sunflower Oil (3L)</td>
<td>14,000</td>
<td>Singida &amp; Arusha, Tanzania</td>
<td>Mount Meru Oil Mills</td>
</tr>
<tr>
<td>Singida Fresh Sunflower Oil (5L)</td>
<td>20,000</td>
<td>Singida, Tanzania</td>
<td>Singida Oil Mills</td>
</tr>
<tr>
<td>Singida Fresh Sunflower Oil (5L)</td>
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<td>Sunola Sunflower Oil (5L)</td>
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<td>Mount Meru Oil Mills</td>
</tr>
<tr>
<td>Sundrop Sunflower Oil (5L)</td>
<td>20,000</td>
<td>Dar es Salaam, Tanzania</td>
<td>Murzah Oil Mills</td>
</tr>
</tbody>
</table>

Name: Ussoke Supermarket in Arusha (across the street from the Korona House where we stayed)
Description: Seemed like more of a convenience store than a supermarket. Product seemed to be very overstocked on some things and very understocked on others, while there was lots of available shelf space. There was a bizarre collection of what seemed like lower end goods and what seemed like luxury goods (very expensive soy sauce for example). Seemed to be more of a liquor store and then you could grab other things than anything else. The owner was responsive to what he pays vendors and non-alcoholic items ranged from 15% to 50% mark-up depending on the item.
Summary of prices observed on 8 May 2017:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price (tsh)</th>
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<th>Manufacturing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Gold Pickled Mangos (300g)</td>
<td>3,000</td>
<td>Arusha, Tanzania</td>
<td>Darsh Industries</td>
</tr>
<tr>
<td>Red Gold Tomato Paste Products (880g)</td>
<td>2,000</td>
<td>Arusha, Tanzania</td>
<td>Darsh Industries</td>
</tr>
</tbody>
</table>
Red Gold Brown Vinegar (1000ml) 2,000 Tanzania, city unknown Darsh Industries
Green Label Tea (50 bags) 2,500 Dar es Salaam, Tanzania Afri Tean and Coffee Blenders Ltd
Kilimanjaro Tea (25 bags) 2,000 Dar es Salaam, Tanzania Afri Tean and Coffee Blenders Ltd
Porridge Flour (1kg) 3,000 Arusha, Tanzania Afri Youth Pride
UNGA WA ULEZI Millet Flour (1kg) 3,000 Arusha, Tanzania NYIREFAMI Ltd
Eden Nutritious Flour (1kg) 3,000 Arusha, Tanzania Eden

Each of the flour companies had e-mail addresses on their packaging:
- Afri Youth – afripridetza@yahoo.com
- ULEZI – nyirefamiltd@yahoo.com - 255 754 278 149
- Eden – greatlishelz@gmail.com

Name: Village Supermarket in Arusha's Njiro Complex
Description: Seemed like Tanzania's version of the expat grocery story as there is one in Arusha and one in Dar es Salaam. Most of the product was of international origin with a lot of products from the US such as multiple types of Pringles and Cocoa Puffs cereal. Most of the people we saw shopping were clearly not East African, but not all white. No palm oil was observed at the Village Supermarket.

Summary of prices observed on 8 May 2017:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price (tsh)</th>
<th>Place of Origin (if known)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best-In Sunflower Oil (1L)</td>
<td>11,900</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>HTC Pure Sunflower Oil (1L)</td>
<td>11,000</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>HTC Pure Sunflower Oil (5L)</td>
<td>44,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Lite Life Sunflower Oil (5L)</td>
<td>44,500</td>
<td>UAE</td>
</tr>
<tr>
<td>Best-In Pure Vegetable Oil (2L)</td>
<td>19,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>White Pearl Vegetable Oil (5L)</td>
<td>42,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>White Pearl Sunflower Oil (5L)</td>
<td>47,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Mazola Pure Corn Oil (1L)</td>
<td>14,500</td>
<td>United States</td>
</tr>
<tr>
<td>Cypress Extra Virgin Olive Oil (3L)</td>
<td>89,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Olive Branch Extra Virgin Olive Oil(5L)</td>
<td>129,500</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Green Label Tea (50 bags)</td>
<td>2,000</td>
<td>Tanzania, city unknown</td>
</tr>
<tr>
<td>Kilimanjaro Tea (25 bags)</td>
<td>1,100</td>
<td>Tanzania, city unknown</td>
</tr>
</tbody>
</table>

Name: Nakumatt Supermarket in Arusha's TFA Complex
Description: Kind of Tanzania's version of a Super Wal-Mart. The supermarket was referred to us by the hotel staff, and was next to BrazAfriic the agricultural processing equipment distributor. There is a Nakumatt Supermarket in Moshi, just west of Kilimanjaro Airport, but it is
unclear to the GAP team how wide the reach of this chain is. The supermarket had a diverse array of locally made products to include Tanzanian sunflower oil, locally milled flour, millet, and soy. Interestingly there were no Red Gold products at all, which was surprising because the Village Supermarket appeared higher end and still carried some Red Gold products. No palm oil was observed in the Nakumatt Supermarket.

Summary of prices observed on 9 May 2017:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price (tsh)</th>
<th>Place of Origin (if known)</th>
<th>Manufacturing Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sundrop Sunflower Oil (3L)</td>
<td>13,700</td>
<td>Dar es Salaam, Tanzania</td>
<td>Murzah Oil Mills</td>
</tr>
<tr>
<td>Sundrop Sunflower Oil (5L)</td>
<td>24,000</td>
<td>Dar es Salaam, Tanzania</td>
<td>Murzah Oil Mills</td>
</tr>
<tr>
<td>Noor Sunflower Oil (3L)</td>
<td>19,500</td>
<td>Egypt</td>
<td>IFFCO</td>
</tr>
<tr>
<td>Sunbelt Sunflower Oil (1.8L)</td>
<td>13,600</td>
<td>Dodoma, Tanzania</td>
<td>Sunshine Industrial Co. Ltd</td>
</tr>
<tr>
<td>Sunbelt Sunflower Oil (3L)</td>
<td>17,700</td>
<td>Dodoma, Tanzania</td>
<td>Sunshine Industrial Co. Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korie Vegetable Oil (3L)</td>
<td>11,800</td>
<td>Dar es Salaam, Tanzania</td>
<td>Murzah Oil Mills</td>
</tr>
<tr>
<td>UNGA WA UWELE Millet Flour (1kg)</td>
<td>2,900</td>
<td>Arusha, Tanzania</td>
<td>NYIREFAMI Ltd</td>
</tr>
<tr>
<td>UNGA WA UWELE Sorghum (1kg)</td>
<td>3,000</td>
<td>Arusha, Tanzania</td>
<td>NYIREFAMI Ltd</td>
</tr>
<tr>
<td>Lishe Nut – Cereal Mix Flour</td>
<td>5,400</td>
<td>Dar es Salaam, Tanzania</td>
<td>Power Flour</td>
</tr>
<tr>
<td>Lishe - Soya Mix Flour</td>
<td>4,200</td>
<td>Dar es Salaam, Tanzania</td>
<td>Power Flour</td>
</tr>
<tr>
<td>Nakumatt Blue Label Coffee (200g)</td>
<td>19,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanica Café (50g)</td>
<td>3,900</td>
<td>Bukoba, Tanzania</td>
<td>Tanganyika Instant Coffee</td>
</tr>
<tr>
<td>Tanica Café (100g)</td>
<td>6,400</td>
<td>Bukoba, Tanzania</td>
<td>Tanganyika Instant Coffee</td>
</tr>
<tr>
<td>Tanica Café (250g)</td>
<td>13,400</td>
<td>Bukoba, Tanzania</td>
<td>Tanganyika Instant Coffee</td>
</tr>
<tr>
<td>Café Bora (50g)</td>
<td>3,900</td>
<td>Bukoba, Tanzania</td>
<td>Tanganyika Instant Coffee</td>
</tr>
<tr>
<td>TanCafe (100g)</td>
<td>6,500</td>
<td>Moshi, Tanzania</td>
<td>Tanzanian Coffee Board</td>
</tr>
<tr>
<td>Tomato Paste Products</td>
<td>2,600</td>
<td></td>
<td>Canadian Harvest</td>
</tr>
<tr>
<td>Peptang Chili Sauce (375g)</td>
<td>2,100</td>
<td>Nairobi, Kenya</td>
<td>Peptang</td>
</tr>
<tr>
<td>Bongo Pili Pili (350g)</td>
<td>5,200</td>
<td></td>
<td>Canadian Harvest</td>
</tr>
</tbody>
</table>
5 Meeting Notes

HAPA

Contact: Noel (founder) and Baraka (facilitator), Peter (driver)
Email: nonmakyao@yahoo.com

HAPA (Health Actions Promotion Association) was our point of contact within the Singida region that provided us access to several businesses throughout the area through their formal governmental introduction process. The company visits benefitted HAPA as a learning opportunity for employment safety and training as well as general community knowledge about profitable local businesses.

- Founded in 1997
  - Sister organization in Tabara HIPO is almost bankrupt
- HAPA means “here” in Swahili
- Focused on health projects within the region for women, children, and youth
  - Hand washing
- Received 2 billion TZS of funding last year from various foreign aid organizations (~$900,000)
- High level of work required for writing funding proposals
- 14 employees with rotating groups of foreign volunteers
- Health and water education (hand washing, sanitation, safe water)
- Youth disease education and prevention (water born disease)
- Looks at problems and tries to come up with action plans for preventing treatment, best practices
- Looking to supplement and facilitate projects between the government, donors and communities
  - HAPA can be a 3rd party to mediate disputes and ensure quality
- Most of the diseases found in Singida are preventable
  - Malaria, cholera, typhoid, diarrhea
- Have done work in more than 6 provinces: Dodoma, Arusha, Kilimanjaro, Morogoro, Singida, Manyara, Shingara
- Believes they have a way to fast track volunteer visas within the government process
- Improve school learning environment
- Provide health services in closer proximity to locals (currently long walks for health service)
- Interesting strategy of using focus groups to determine root causes of issues, as well as underlying reason for local citizen needs

http://hapa.or.tz/about.php?page_id=hapa_profile+23443?§
Health Actions Promotion Association (HAPA—SINGIDA)

ORGANIZATION PROFILE

ORGANIZATION, NAME, AGE AND LEGAL STATUS

Health Actions Promotion Association (HAPA) is a Tanzanian Non-Governmental Organisation (NGO) established in the year 2000 and registered in May 2001 under the Societies Ordinance with registration number is SO 10892.

CONTACT DETAILS

P.O. Box 1013,
SINGIDA
Plot Number 134,
Mwanza Road - Singidani area
Singida Municipal.
Telephone: +255(0)262502499
Fax: 026-2502311
Email: info@hapa-singida.org
Web: www.hapa.or.tz
Mobile Telephone: +255(0)783975372

VISION

HAPA envisions a Healthy, Educated and Empowered society.

MISSION

HAPA is a reputable organization that enables, creates and sustains wellbeing of communities by provision of quality services in water, health and education in collaboration with stakeholders.

ORGANIZATIONAL GOALS

1. Promoting community awareness and practices on reproductive and child health, ASRH and increasing access to health facilities.
2. Increasing access to clean and safe water and promotion of H&S practices.
3. Increase community access to quality education and improvement of learning environment.
4. Promoting income generating activities to marginalized group i.e. youth, women & people with disabilities.
5. Promoting good governance to rural communities.
6. Strengthening the institutional and organizational capacity of HAPA.

In pursuing the mission HAPA will operate by using participatory approach. The organisation is also committed to the highest standards.

HAPA CORE VALUES

HAPA's development initiatives and processes are shaped by seven core values:
(a) Commitment
(b) Accountability
(c) Learning
(d) Voluntarism
(e) Effectiveness
(f) Transparency and democracy
(g) Team work

ORGANIZATION BACKGROUND

HAPA was formed after the closure of the Health Project Abroad (HPA) a British NGO in 2001. HAPAs work is governed by its Constitution and Government or Sector policies. For example by the year 2025 Poverty eradication will be 85% and also beneficiaries and other parties will be involved and participate in their development work.

PROJECT AREA

HAPA operates in the regions of Tanzania Mainland, Current at Ikungi, Mkalama and Iramba Districts of Singida Region.
ORGANIZATION, NAME, AGE AND LEGAL STATUS

ORGANIZATION BACKGROUND

Health Actions Promotion Association (HAPA) is a Tanzanian Non-Governmental Organization (NGO) established in the year 2000 and registered in May 2001. HAPA was formed after the closure of the Health Professional Abroad Project (HPA) a British NGO in 2001. HAPA operates by using a participatory approach, involving and collaborating with the community and other parties in its development initiatives. Under the Societies Ordinance, HAPA is registered with registration number SO 10892.

HAPA CORE VALUES

HAPA's development initiatives and processes are shaped by seven core values: Team work, Transparency and democracy, Effectiveness, Voluntarism, Learning, Commitment, and Human Resource.

ORGANIZATIONAL CAPACITY

HAPA works very closely with other grassroots development partners on a collaboration basis to pursue their development agenda. These include the Tanzania Water and Sanitation Network (TawasaNet), SINGONET (Singida NGO Network), SRHR southern Africa Alliance.

NETWORKING & COLLABORATIONS WITH OTHER NGOs

HAPA is the member of Tanzania Water and Sanitation Network (TawasaNet), SINGONET (Singida NGO Network), SRHR southern Africa Alliance.

The Organisation specialises in three aspects: HEALTH, EDUCATION & WASH programmes.

Health

Target Group
Young people, Adult men and women.

Activities
(a) Training of community selected groups i.e. PE, CORPS, TOT, Folk media, Health Care Providers.
(b) Gender Focused Discussions.
(c) Weekly training sessions targeting men.
(d) Strengthening community structures such as health committees.
(e) Community sensitizations meetings.
(f) Designing & production of IEC promotion materials.
(g) Lobbying and Advocacy.
(h) Monitoring, backstopping support visits.
(i) Baseline surveys, mid-term evaluations and end of project evaluations.

Approaches
(a) PRA
(b) Community Score card.
(c) Male involvement.
(d) Child to Child.
(e) Mass campaigning.
(f) CBHC.
(g) Puppet shows.
(h) Competitions.

Education

Target Group
Young People

Activities
(a) Formation & training of school health clubs on life skills, HIV/AIDS, hygiene and sanitation.
(b) Construction/rehabilitation of classrooms, staff houses, gender friendly latrines, harvesting rain water tanks.
(c) Supports desks and books.
(d) Supporting school feeding.

Approaches
(a) PRA
(b) RRA
(c) Community mobilization meetings
(d) Child to Child (CIC)
(e) Peer education
(f) Interschool competition
(g) SWASH guideline.

Water Hygiene & Sanitation (WASH)

Target Group
Young people, Adult men and women

Activities
(a) Training of community selected group’s i.e. Local artisans, animator, and community sanitation committees on hygiene & sanitation promotion, constructions of low cost latrines, entrepreneurship skills & Sanitation marketing.
(b) Formation and training of Community Water Supply Organizations (COWSOS).
(c) Hygiene and Sanitation marketing & campaigns.
(d) Demonstration of low cost latrines options through construction of sanitation centers.
(e) Rehabilitation/development of productive boreholes & shallow wells as well as pipe schemes.
(f) Designing & production of IEC promotion materials.
(g) Construction of rainwater harvesting tanks.
(h) Lobbying & Advocacy.
(i) Monitoring, backstopping support visits.
(j) Baseline surveys.

Approaches
(a) PHAST
(b) CLTS
(c) Child to Child
(d) MTUMBA approach
(e) Sanitation Marketing campaigns
(f) PRA.
ORGANIZATIONAL CAPACITY

**Human Resource**

There are 14 Individuals who have different technical and professional skills and are conversant with community participation methodologies and techniques that are used by HAPA. The team has been involved in Community interventions for a considerable period of time.

**Physical Assets**

(a) Modern office block along Lake Singidan.
(b) Latest office equipment including computers with Printers, Telefax and Internet facilities.
(c) A small yet up-to-date documentation centre located at the main office block.
(d) Four vehicles owned by the organization and a fleet of other vehicles are readily available on hiring basis.

**Financial Capacity**

HAPA implements projects from different donors and her annual income differ yearly depending with the number of donors in that particular year. The organizations over head cost usually is 15% but may differ in other donors that pay directly the staff that implement the project in question. HAPAs current income is Tshs.1 Billion a year that is from different funding partners and her accounts are externally audited annually. Therefore it is believed that this project can be implemented within the stated period due to the experience drawn from the previous years in Implementing water hygiene and sanitation and other projects.

GOVERNANCE AND LEADERSHIP

The organs of HAPA include the General Meeting, Board of Directors and the Management Team, which are governed and directed by HAPA Constitution. The organisation management and financial regulations are stipulated in operational manual. The Board of Directors, which has no decision power, is charged with the responsibility of monitoring, supervision and in advising HAPA and to provide support to the management team of HAPA on matters related to planning and management of resources. The General Meeting where all HAPA members are involved is the highest organ with powers and final decision on all matters of the NGO.
Health Actions Promotion Association (HAPA) is a Tanzanian Non-Governmental Organization (NGO) that was established in 2001. It is an association working closely with other grassroots development partners on a collaboration basis to achieve their goals. HAPA is the member of Tanzania Water and Sanitation Network and other parties will be involved and participate in sustainable development projects.

HAPA works very closely with other grassroots development partners on a collaboration basis to achieve their goals. HAPA's development initiatives and processes are shaped by seven core values:

1. Commitment
2. Financial Capacity
3. Learning Approaches
4. Participation and collaboration
5. Sustainable Environment Management Action (SEMA)
6. Monitoring and evaluation
7. Advocacy

HAPA's current income is Tshs. 1 Billion a year that is from different funding sources. The organization's overhead cost usually is 15% but may differ yearly depending on the number of donors in that particular year. HAPA implements projects from different donors and her annual income differs yearly depending with the number of donors in that particular year.

There are 14 Individuals who have different technical and professional skills and are conversant with community participation methodologies and approaches. There are three types of membership for any interested person wishing to join HAPA. Levels of membership are:

- Ordinary Membership
- Associate Membership
- Collaborator Membership

All employees of HAPA are encouraged to apply for ordinary membership and shall be open to any person or organization who promotes or supports the cause of the organization without having to pay membership fee and subscriptions and has been approved by the Board of Directors and has paid the membership fee and subscriptions.

HAPA's development initiatives and processes are shaped by seven core values:

1. Commitment
2. Financial Capacity
3. Learning Approaches
4. Participation and collaboration
5. Sustainable Environment Management Action (SEMA)
6. Monitoring and evaluation
7. Advocacy
NETWORKING & COLLABORATIONS WITH OTHER NGOs

HAPA works very closely with other grassroots development partners on a collaboration basis/networking. Our Partners include government agencies and/or departments and other NGOs operating in Singida Region. These include:-

**Networking**
HAPA is the member of Tanzania Water and Sanitation Network (TawasaNet), SINGONET (Singida NGO Network), SRHR southern Alliance.

**Collaboration**
(a) Sustainable Environment Management Action (SEMA).
(b) Youth Movement for Change (YMC).

MEMBERSHIP

There are three types of membership for any interested person wishing to join HAPA. Levels of membership are:

**Ordinary Membership**
Is open to any person or organisation who/which agrees, promotes, supports and pursues the aim and objectives of the organisation and has paid his/her membership fee and subscriptions. All employees of HAPA are encouraged to apply for ordinary membership.

**Associate Membership**
Shall be open to any person or organisation who/which promotes or supports the cause of the organisation and has paid the membership fee and subscriptions. All employees of HAPA are encouraged to apply for ordinary membership.

**Honorary Membership**
Shall be open to any person or organisation who/which promotes or supports the cause of the organisation without having to pay membership fee and subscriptions and has been approved by the Board.
Singida Fresh Oil Mill
Contact: Minha Mohamed – assistant for Singida Fresh's owner
Email: minhamohamed@hotmail.com

Under the guidance of the Health Actions Promotions Association (HAPA), the team visited the Singida Fresh Oil Mill. They are a small sunflower oil producer within the town of Singida. The facility was set up very similarly to the facility at YAZA sunflower oil, and we could see production of the product and processing. The management was extremely hospitable and gave us two boxes of sunflower oil: a case of six 3 liter bottles and a case of four 5 liter bottles. We insisted it was not necessary, but we were very grateful. Since we could not bring 44 liters of sunflower oil on the plane back to the United States, we gave it to our friends at HAPA who had done such a wonderful job hosting us in Singida.

History
• Began as a family business in 2010.
• It has outgrown the family
• Sunflower oil is the main product in Singida and nearby regions because of the climate

Processing Facility Operations
• Current capacity to crush 50 tons of raw seeds per day
• While other facilities may operate year round, the supply of their seed intake is too low during some months and they do not operate during the off season.
  o ~3 months
• One of their obstacles is availability of spare parts for their machines
  o Bought from China and India
  o Can take several months to get parts
• When there is good supply of seeds they will crush 24 hrs/day
• 20 permanent employees
• 100 employees that are not permanent
• Sometimes they get skilled workers, but will also hire employees that do not possess the skills and require training
• Steps:
  o Cleaning – they find dirt and rocks mixed in with seeds
  o Pressing
  o Filtering – filters changed once per week
  o Packaging
• No backup power

Supplier Network
• Challenges
  o Quality of seeds is an obstacle for them
    ▪ Government is working to improve the quality of seeds by giving farmers the good seeds to grow.
    ▪ Government is pro-industry
• Their goal is to help Tanzanian businesses become an agri-business power
• Believe that government will increase tariffs when industry asks
  o Rainfall
  o Quantity of seeds
  o Power outages are common and the plant must shut down when the power goes out
• They use small scale farmers to buy seeds from
  o Farmers bring seeds to them or they have agents that go and get them
• 2010 – 1000 TZS for 1 kg of seeds. 60kg of seeds produced 25L of Oil
• 2017 – 2000 TZS for 1 kg of seeds. 60kg of seeds produces less oil, around 15L.
• Only purchase seeds, will not purchase raw oil because of purity

Sales
• Demand currently far exceed supply capacity
• Quality is down, price is high
• Distribute products to customers in bulk
• Customers can also buy directly at the facility but in some cases, they will ship product
• Currently sell seed cake, but in the future, will have another factory to produce seed cake and turn into animal feed
• Packaging Material comes from Dar es salaam and Arusha as well as Mt. Meru
• 3L very slow moving
• 5L – best seller
• 17kg – sell in Moshi and Dar but not anywhere else
• Peak season August to December for production

Future Goals
• Next 2-3 years they plan to open another factory where they can crush 300 tons/day
• Expanding because they have help from local bank and are getting more customers

Sunflower Oil Market
• Why is it growing?
  o People are becoming more aware that it is good for their health
  o Used to come as an import
  o Good demand and publicity
  o Government will help to expand outside of Tanzania
  o Offer good business for farmers
  o Economy will do better
Yaza Sunflower Oil Processing (Halisi)

Contact: Yusef Amir (Factory founder)

Under the guidance of the Health Actions Promotions Association (HAPA), the team visited the YAZA sunflower oil production facility located about 60km west of Singida town. The facility exemplified superior standards of operation as well as provided insight on how a local Singida resident, Yusef, build a prospering business through his own private investment.

History

- Yusef, the owner of YAZA, started in the sunflower oil industry as a buying agent in the Singida region for other oil producers
- By personal bank loans, Yusef outfitted his own oil press factory and began selling in 2015
- Yona Joram – Yaza Investment Company Ag consultant
- Opened plant to be closer to farmers, allowed him to pay a higher price than Mt. Meru

Processing Facility Operations

- Current capacity to crush 60 tons of raw seeds per day
- Operated year-round despite the sunflower growing season limitations
- Two new machines are on order as demand is high
- Seed cake is a by-product of the crushing process and is used for animal feed
- Electricity from TANESCO has significantly improved one or two outages per month
- Corn waste used in the boiler rather than oil (expensive or wood)
- Weight bridge being installed as incoming product is weighed
- Steps of process
  - Receiving
  - Cleaning: two parts
    - Bulk: removes rocks
    - Fine: removes dirt, built on site
  - Pressing
    - Seed cake is capture and packaged for sale to animal feed companies (350 shillings per kg)
    - Pressing occurs 24/7 except for scheduled maintenance and steps when the machines get too hot – 100 total employees
    - Presses from India run $60k-70k
  - Filtration – filters are changed every day
    - Sterile area
    - Filtration machine is three stories high
    - Oil is pumped to storage tanks outside to await packaging
  - Packaging
    - Faucets are used to fill containers
    - Electronic weighing machines is used to ensure correct amount of oil is used
    - Quality assurance person assigns expiration date
• Yield 22 to 26% currently, 40-46% is possible

Supplier Network
• Seeds are purchased from Singida region farmers either at the factory location, or through buying agents that travel the region in large trucks
• Higher prices are paid outside of the harvest season, so farmers hold back product if they can afford
• YAZA ultimately wants to have some of their own farm land to grow seeds, but the next step is to enact contract farming to ensure high quality seeds
• YAZA needs to supply seeds to farmers so they are not cultivating raw product from the same plant genome year after year, which results in poorer quality seeds
• Only 3% of farmers use modern farming techniques
• TBS does not allow raw oil to be purchased by certified companies
  o Raw oil is considered illegal for sale
• Yaza purchased their own trucks to transport seeds
• Limited access to working capital financing (working line of credit)
• Spoke of farmers owning 10 acres, but only farming 2 acres

Sales
• Demand currently far exceed supply capacity
• Currently only domestic, refined oil sales
• Future plans to sell in Europe as organic, natural sunflower oil
• Sizes sunflower oil is sold in is 1L, 3L, 5L, 17kg, 8.5kg (5L is most popular)
• Big shop owners have been targets by YAZA
• 2015 – 600 shillings per kilo
• 2017 – 1000 shillings per kilo
  o 1kg of oil sells for about 3000 shillings
  o 2015 was a bad year
• Sales in Arusha, Dodoma, Zambia
• Shelf life of most edible oils is 1 year
• Large quantities of oil are purchased and resold in rural areas in smaller quantities

Future Goals
• Purchase land to grow their own seeds
• Contract farmer – Yaza supplies better seeds to the farmer
  o Yaza would till, plant
  o Multi-crop thrashers brought in to leave unwanted products behind
• Using generational seeds provides reducing returns
Equipment

- YAZA currently operates with 4 of these presses, which appeared to purchased used, which allows for 60 ton of raw seed per day production.

- YAZA recently purchased 2 additional presses with higher capacity from India at roughly $60,000-$70,000. When operation, total of 6 presses will allow for 100 tons/day of raw seed production.

http://www.oilmillmachinery.com/
Mount Meru Oil Millers

- Absolutely no photos were allowed within Mount Meru facilities.
- Mount Meru's operations staff were not informed we were coming by the team HAPA coordinated the visit with. Therefore, we were not provided names or POC e-mails for the staff we eventually met with.

Sales and Marketing

- Mount Meru (MM) makes refined sunflower oil and sells it domestically under the brands of Sunola, Goldy, and Flora.
- MM sales in 3 liters, 5 liter, & 10 liter bottles, however their 10 liter and 20 liter bottles are the best sellers. We heard this from other companies and it is believed that there is customer value in the buckets for future use while the bottles are discarded after use.
- Orders for 2017 are very high. All three millers said they cannot fill all the orders they are receiving. Halisi commented that customers with delivery agreements are sending their staff to the mill to squat for their orders.
- MM's process creates dry oil cake (DOC) byproduct that they ship to Nairobi and India where processors use it as an input in animal feed. MM has no interest in using DOC to create their own brand of animal feed.
- MM previously tried to expand their Singida facility into cotton processing, but that investment failed as the cotton was too 'dirty' to work with. We believe this met of very low quality.

Supplies of Seed

- Mount Meru (MM) operations are so large that they must look far and wide for sunflower seed to press. They stated they frequently buy seed as far as 500km away including in Iringa, Shingaya and Dodoma. It is believed that the other millers get most of their cake from Singida Region.
- MM has added additional silage to ensure that shut downs caused by the unavailability of seed is minimal. They did not wish to reveal how many tons of silage they have, but it was huge.
- In the slow season MM receives 4 to 5 trucks a day of seed, however in high season (May to August) they receive up to 10 trucks a day.
- MM is willing to pay for higher quality seeds and has invested in helping farmers with mixed results:
  - MM has training classes to help farmers improve usage of fertilizer, seed and improve harvesting techniques. They don't feel these have been successful.
  - MM gave high quality seed to 10,000 farmers previously. They observed many of the farmers sell the seed immediately, and although there were purchase contracts in place so MM would be the sole purchaser of the seed they were unable to enforce these and they believe Halisi got much of the high-quality seed.
• MM stated the 2017 season has gotten off to a very slow start. The plant manager is travelling to Dodoma on 17 May to understand why MM agents aren't buying seed as Dodoma is usually one of the early harvesters.
  o They suspect that middlemen are buying all the seed to hold until prices rise. 2017 is widely known to be a very bad season for sunflowers so there is expected to be a shortage.

Operations
• Mount Meru was expecting to process 200 tons of seed the day we visited, which was a slow day. This made them the largest miller we visited as they Singida Fresh's capacity was 50 tons per day while Halisi was installing presses to expand their capacity from 60 tons per day to 100 tons per day. Max capacity of Mount Meru was not revealed but we believe it to be more than 500 tons per day.
• As Mount Meru is so much larger than the other millers we visited it is not surprising that their operations were quite different.

• Halisi and Singida Fresh used the following process:

<table>
<thead>
<tr>
<th>Step #</th>
<th>Oil Process</th>
<th>By Product Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Receive Seed</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>Clean Seed</td>
<td>Dirt, stone, &amp; non-sunflower grains disposed of</td>
</tr>
<tr>
<td>3)</td>
<td>Press Seed to Oil</td>
<td>Seed Cake Packaged for Shipment to Nairobi</td>
</tr>
<tr>
<td>4)</td>
<td>Filter Oil</td>
<td></td>
</tr>
<tr>
<td>5)</td>
<td>Package Oil</td>
<td></td>
</tr>
<tr>
<td>6)</td>
<td>Ship to Customers</td>
<td></td>
</tr>
</tbody>
</table>

• Mount Meru used the following process:

<table>
<thead>
<tr>
<th>Step #</th>
<th>Oil Process</th>
<th>By Product Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Receive Seed</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td>Clean Seed</td>
<td>Dirt, stone, &amp; non-sunflower grains disposed of</td>
</tr>
<tr>
<td>3)</td>
<td>Deshell Seed</td>
<td>Sunflower husks used with other biomass to fire the steam boiler that runs the plan</td>
</tr>
<tr>
<td>4)</td>
<td>Press Seed to Oil</td>
<td></td>
</tr>
<tr>
<td>5)</td>
<td>Secondary Press of Oil</td>
<td>Seed Cake Packaged for Shipment to Nairobi</td>
</tr>
<tr>
<td>6)</td>
<td>Filter Oil</td>
<td></td>
</tr>
<tr>
<td>7)</td>
<td>Package Oil</td>
<td></td>
</tr>
<tr>
<td>8)</td>
<td>Ship to Customers</td>
<td></td>
</tr>
</tbody>
</table>

• Mount Meru has two additional advantages that are not highlighted above:
  1) MM's primary presses can extract between 28% to 32% oil which is higher than any of the other companies which were between 18% to 24%.
  2) MM's double extraction process yields another 10% to 15% oil which no one else we visited does, although it was visible in the oil cake that oil remained. MM will purchase seed cake from other millers to use exclusively in the secondary press.
• MM has an impressive QA laboratory on site. They routinely conduct Free Fat Acid (FFA) tests to ensure product quality. Seed, oil and DOC are sampled to ensure everything is working correctly.
• Mount Meru's management in Singida are under extreme pressure as they are not currently covering operating expenses at the plant.
• MM receives power from TANESCO but outages are a frequent issue. They have a back-up generator that is increasingly costly to operate.

Talent Management
• MM has 100 full time employees at the plant and use day labor for simple tasks. Up to 200 day laborers are hired during the peak processing season to keep the mill running 24/7.
Masasi Food Industries/ Lulu

Contact: Charles – Owner/Director

The team visited Masasi Food industries in Kimbaha outside of Dar es Salaam. Bahati set up this meeting for us through the connections between UNIDO. They have recently become certified ISO 2000. The visit was helpful to see a competitor of Darsh Industries, at a smaller scale and learn about their rewards and challenges.

History

• Began in 2012.
• Lulu is brand name and named after his wife ‘Lulu’
• Entrance strategy was on quality, but suffering because of price sensitivity of locals
• Private shareholders
• Equity is financed by bank/resources
  o Interest rates are very high – 22%

Processing Facility Operations

• Manufacture plastic bottles and bottle their own water
• Structure – 3 departments
  o Technical
  o Production unit 0- 100% production done within facility
  o Marketing/selling/general admin
• Currently expanding in water line
  o New commercial line for water production
• Tomato capacity is 2.5 tons/hr
• Equipment is from Turkey, China, India and Japan
  o Spare parts are a problem, sometimes will stock parts
• Lacking food science technology

Supplier Network

• Tomatoes – June-August
  o Prices are high at other times of the year for buyer
  o During off season use own material that they save during the season
    ▪ Can be stored for 18 months in bags that have no preservatives
  o Buy tomatoes from Iringa and Morogoro
• Broker Problem
  o Considering strategies to bypass brokers
    ▪ Some farmers have agreed to be contract farmers
  o Issue of being able to trace where product is coming from which inhibits them from being able to export
  o Brokers add 50%+ up charge
  o Farmers get lured into selling to broker
    ▪ They want money immediately
    ▪ Need to fully educate farmers on what prices to sell and what brokers vs. processors will buy for
• Mangos – southern part of Tanzania, Tanga, Tabora

Sales
• Water is easiest product to sell
  o 90% of sales revenue
• Regions they sell to: Mbeya, Mwanza, reintroducing Morogoro, used to be in Dodoma but could not get people to distribute
  o Kenya is difficult market to enter, very competitive and protect against others from coming in
• Most local people cannot afford their product
  o Issue is income
  o Price sensitive
  o Will try to cater to lower market
    ▪ ‘Poa’ products – cheaper to satisfy
    ▪ Will use same brand and less expensive packaging – plastic instead of cans
• Wholesale trade/distribution
  o If your product is not well known, they will not buy
• Retailers will buy – company is jumping over the wholesale/distributor channel
  o Will take small quantities of new product
• Market is dictating all pricing
• Will offer special price for distributors because they buy in bulk
  o Volume matters most for their profitability
• Tomato paste is new product, anticipate it taking over as most profitable

Future Goals
• Own farms or contract farmers
  o Looking to invest in farms to produce their own tomatoes
• Export
Avomeru

Contact: Jess – Founder
Market overview and opportunities for Avocado oil.

- Avocado oil in Tanzania is imported product.
- There are lots of avocado with no market and limited access to drip irrigation. Avocado trees are planted as shade trees for coffee plantations.
- 1 green avocado currently gives 9-13% oil (compared to 17-20% of oil for Mexican avocado).
- 110 million avocados go to waste each year in one village of Leguruki.

Current business model
- Start-up business since 2013 by a young Tanzanian. Originally, he got the support from his family to start, and then kept his business running thanks to the several funding sources since inception.
- Avomeru buys raw oil from farmers, then refine it to higher value oil in Arusha and sell to the distributor in Nairobi. The refined oil will be sold as ingredients for cosmetic companies for soaps and lotions.
- Avomeru provides machine to the farmers (30 farmers get one machine).
- Current location: Leguruki village, Kingori region in East Arusha (2 hours from Arusha to Kilimanjaro mountain). He is building 3 more sub-factories to expand the production.
- Capacity: Up to Sep ’17, Avomeru has produced 8000 liters of oil. They produced 6,800 liters in the year 2016 (price at 11USD per liter to distributor), and plan to produce 18,000 liters in 2017 with the price of 18USD/liter. Current capacity of Avomeru is 1,800 liters/day.
- Shelf life for avocados is 2-3 days, so they must be processed to oil to keep the value. Oil shelf life is 9 months.
- TFDA certificate is in progress.
- Current facilities: Twenda built the raw oil extracting machine, Avomeru built the refining machines (MIT support the dryers and filters used in the process)
- There are 2 ways to extract the oil from avocado: drying under the sun and decanting process (during rainy season) where corn husks are mixed with avocados to dry them.
- Partners:
  - AISEE: accelerating Innovation through Social Entrepreneur Enterprises.
  - In IDDS Summit, Avomeru got the support from MIT for prototype of raw oil processing equipment. VOCA is a group of MIT students who assisted in making prototype for Avomeru.
  - Echo: provides transportation support to get to the village.
- TANEICT: funding source of 9,000 USD.
- USADF (US African Development Fund). Through this organization, Avomeru competed in YSELLI entrepreneur fund and got 25,000 USD.

- For now, Avomeru would need a funding of 350,000 USD to build supporting infrastructure: warehouse and logistics, office space, IT support, employees.
BrazAfric
Contact: Stella

The GAP team went to BrazAfric’s Arusha sales location at the TFA shopping complex in Arusha on the morning of May 9th. We met with Stella, a sales Associate with BrazAfric. BrazAfric (BA) is a Brazilian based small agricultural machine provider who has also expanded to provide environmental solution products (instant shower heaters). Their main competitive advantage is through providing new small farm products with various payment options (cash, credit, installments) along with product warranties, training, service, delivery, and part replacements.

Product
- BA’s African central office is in Nairobi, which is also where most BA’s products are distributed from
- 90% of their agricultural machine and instant shower heaters are imported from Brazil
- Most of their products deal with coffee and grain production, but they also sell small to large size grain storage equipment
- Fuel powered equipment is a more common purchase than electrical equipment due to obvious electricity constraints

Pricing and Payment
- Customers can pay in full with cash or credit, or have the option to make a down payment and pay off the remaining balance in installments
- Common for 50% down payment required
- If payments are missed by a customer, BA is very lax in their enforcement, allowing substantial time for the small farmer to make their payments. They do not repossess equipment.
- BA also allows for group purchase, which would be ideal for a cluster of houses or a group sharing farmland

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Total Price TZS (VAT included)</th>
<th>USD Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foliage Shredder with Motor (size 80)</td>
<td>1,800,000</td>
<td>$800</td>
</tr>
<tr>
<td>Foliage Chopper without Motor (size 40)</td>
<td>750,000</td>
<td>$333</td>
</tr>
<tr>
<td>Corn Thresher with Motor</td>
<td>1,400,000</td>
<td>$622</td>
</tr>
<tr>
<td>Corn Thresher without Motor</td>
<td>1,200,000</td>
<td>$533</td>
</tr>
<tr>
<td>Palm Shredder</td>
<td>1,200,000</td>
<td>$533</td>
</tr>
<tr>
<td>Sorghum Thresher</td>
<td>3,950,000</td>
<td>$1,756</td>
</tr>
<tr>
<td>Coffee Machine (size 1)</td>
<td>3,700,000</td>
<td>$1,644</td>
</tr>
<tr>
<td>Coffee Machine (size 2)</td>
<td>5,700,000</td>
<td>$2,533</td>
</tr>
</tbody>
</table>

Customer Service
• BA provides training to farmers that purchase any equipment to both educate them on the product usage and prevent improper use that would lead to mechanical failure
• BA issues a one-year warranty with new products
• After warranty expires, BA also provides spare parts and service with preference to complete service at the buyer’s location so they can also see if any misuse caused product failure
• If replacement parts are not available through the Arusha office, which a majority are, then it can take 2-3 weeks to receive parts from the Nairobi office, meaning a farmer is unable to process their crops for that time period.
Grain Post-Harvest Loss Prevention a Helvetas Project

Contact: Lugendo Msegu
E-Mail: lugendo.msegu@helvetas.org
Phone: 255-756-279-888

Project Background

• Pilot started in 2013 and was completed in 2014. Phase 1 started in 2014 and will be completed in 2017. Phase 2 plan will be finalized in 2018 but Helvetas will be more of a consultancy for other organizations that want to complete similar projects. They have at least three organizations they are assisting with somewhat similar projects.
• Project methodology mirrors another Helvetas project that was successful in South America.
• This was the only organization we found, or even heard of, working on Post-Harvest Loss Prevention. Many organizations and the Government of Tanzania are working on issues with seeds, growth techniques, and food processing.
• Targeted at small farmers which Helvetas defined as 3 acres or less. Farmers this size can harvest 6 to 15 100kg bags of crop per season.

Project Objectives

• Increase storage capacity for small farmers.
• Ensure market based storage solutions.
• Post-harvest policies and outcomes are improved.

Problem/Causes of Loss

• Root cause is that the major sources of loss are not tangible to the small farmers, defined as having 3 acres or less by Helvetas. However, loss is estimated between 15% to 40% by most experts depending on the area and the crop. Below is a summary of causes of loss:
  1. Manual processes are common; even animal power is not used. Hand processing causes more loss than mechanical processing. Think removing corn kernels from the corn ear.
  2. Delayed harvest causes loss.
  3. Transportation in wooden carts creates loss as grains fall out of the cart over the side or through holes between boards.
  4. Drying after harvest is not 100% efficient as it is completed on the ground. Animals eat it, kids run through it, it blows away.
  5. Local granaries do not preserver grain well. Pests, fungus, smooching cause loss.
  6. Chemicals, such as acetic acid, are commonly used to help preserve grain. However, dosages and application techniques are frequently incorrect. Acetic acid needs to be reapplied after three months and almost never is.

Phase I Overview

• Helvetas project targeted four of the seven regions in the Central Growth Corridor. Those are Manyara, Shinyanga, Dodoma, and Morogoro. Each region had two focus districts and each focus district had nine focus wards.
• Helvetas focused on five clusters to influence outcomes that tied to the project objectives.

1. Coordination & advocacy through multi-stakeholder platforms
   - Ensured partners at the national, regional and district level were informed about the project.
   - Partners: Agriculture Non-State Actors Forum (ANSAF) was the implementing agency for the national policy effort and INNODEV Consulting Company Ltd. was the implementing agency for the district policy effort.

2. Awareness raising, communication & farmers training.
   - Education program on prevention of post-harvest loss. Used printed media, radio, town parties and loud speakers on cars to raise awareness.
   - Market Actor Partners: Mpoli Agrovet, Mringo Agrovet, Kisusi Agrovet, and PPTL.
   - Other Partners: Women and Poverty Alleviation in Tanzania (WOPATA), Small Industries Development Organization (SIDO), and INNODEV.

3. Manufacturing of quality silo and other Post-Harvest Techniques (PHTs)
   - Hermitic technology – Oxygen free environments that don’t allow insects and some diseases to survive long reducing loss.
   - Standard plastic bags are usually used (quoted at 1500tsh in Arusha market), but PICS bags are double nylon bags that don’t allow oxygen in.
     • Quoted at 5000tsh per bag, however a quantity discount would be given at the Arusha TFA.
     • Lugendo said PPTL in Tanga and Agroside in Arusha also have PICS bags.
     • PICS bags are a Purdue invention that has a large institute working to further develop them. PICS bags generally only last for three seasons.
     • PICS bags are not resistant to animals (rats, mice etc.)
   - Metal silos are not produced centrally, as they damage easily during transportation. Local tinsmiths only need to understand soldering to make the silos which is easy to find and it injects further money into the rural economies and supports local artisan development.
     • GPLP has designs for 250kg, 500kg, 1,000kg and 2,000kg silos.
     • Metal silos can last for 20 years if kept in the shade.
     • The GAP team saw a handful of these driving from Arusha to Singida in Manyara Region.
   - The blue plastic barrels seen in many GPLP marketing materials did not go well. They were intended as an intermediate step between the PICS bags and tin silos, but they were frequently immediately repurposed to use for water once given out.

4. Access to financial services to buy/produce PHTs
Range of options are given to farmers. They usually select PICS bags first and then upgrade later to the metal silos.

- Village community banks pool money to purchase silos or PICS bags.
  - Partners: Social and Economic Development Initiatives in Tanzania (SEDEIT) and Center for VICOBA Microfinance and Enterprise Development Ltd. (CEVEDE).

5. Action Research, Monitoring and Learning

- Partners: Fund for African Rural Innovation Promotion (FARIP) & International Institute of Tropical Agriculture (IITA).

- One project officer is assigned to each of the five clusters to manage stakeholder and partner involvement.
- Key lesson learned from Phase I is that whatever is taught, provided or coordinated for probably will not happen that planting season. It will probably happen the following season.

Phase II

- Will be finalized in 2018 based on funding available and lessons learned.
- Intent is not to expand to other regions but focus more on influencing key actors. Here are some examples of their thoughts:
  - “Crop-In” other actors – See if actors marginally involved in the project or outside the project adopt some principles of the project based on it intending to be very market based.
  - Showcasing – Focus on exhibitions and storytelling of the project’s successes.
  - Establish a Center of Excellence for knowledge transfer and allow the market to drive adoption. Focus on making successes available and transferrable to others.
  - One other organization is running a similar project, but is subsidizing the purchase of the silos to speed adoption.

Warehouse Receipt System (WRS)

- We asked Lugendo about how they convince farmers to store their harvest and wait for better prices. He stated most of the farmers sell at the low based on cash needs, not due to ignorance or bullying. Then he walked us through the WRS system GPLP has had success with.
- GPLP set-up a program with micro-finance lenders and farmers for a WRS that was embraced by both parties. Fundamentally here is how it worked:
  1. The micro-finance lender would provide the farmer a ‘loan’ with the harvest as collateral at the current market value, generally the annual low point.
  2. They would place the harvest in a dual lock air tight container, where the micro-finance agent and the farmer would each get a key.
  3. As prices rose the farmer and the lender would negotiate and agree on the best time to sell the ‘collateral’ (the harvest). Generally, the farmer and lender agreed to sell when the value of the harvest was 75% to 100% greater than the amount represented as the principal on the loan.
4. The lender would collect their principal repayment and interest, generally 20-25% of the value of the principal, while the farmer would get the remaining margin.

- This system had ancillary benefits as micro-finance now had the scale in small villages to extend its reach to areas that formerly did not have the demand available to support a MF branch.
  1. Helps educate people about MF so they are more comfortable using MF for larger purchases with longer repayment periods, such as purchasing metal silos.
  2. The MF branches would be looking for work in non-peak periods and are incentivized to work with potential entrepreneurs on setting up out of project scope businesses that would further expand the economic opportunities available within target villages.

Value of Crops in the Central Growth Corridor
- Maize and sunflower seeds were the two crops most commonly dealt with during Phase I by GPLP.
  - Maize pricing is very low during the harvest but tends to gradually rise until December.
    - Maize pricing is low from June to August.
    - In December, the forecasts of rain are released for the next season and if a dry year is forecasted the price of maize will rise incredibly quickly (double in less than 30 days has occurred).
  - Sunflower pricing is low from June to August, but rises thereafter.
    - How quickly the price rises depend on the quantity of the harvest the prior year and the expectations for the harvest the following year.
    - Sunflower seed prices are generally rising as demand for sunflower oil increases.
    - However, the risk for aflatoxin is also increasing within the sunflower crop. This is caused by improper drying once the seeds are removed from the flower.

How does this translate back to income growth in rural economies?
- Three ways:
  - Farmers sell for higher prices.
  - Farmers have more harvest to sell as less is lost due to spoilage or poor techniques.
  - Metal silo construction locally keeps and injects money into the community's economy. Not only does this support local tinsmiths, but is also increases the availability of work for day laborers.

Middle Man Rubric
- Nina Nehimbi and Lugendo agreed that there are three root causes to small farmers selling to middlemen.
Small Industries Development Organization (SIDO) Arusha office

Home address: Unga Ltd Azimio Area, SIDO Estate P.O. Box 1278, Arusha, Tanzania
Tel: +255 27 250 2842, +255 754 778 360, +255 716 187 777
Contact person: Regional Manager, Nina H. Nehimbi
Email Official: arusha@sido.go.tz
Email Personal: nina.nchimbi@gmail.com, nnchimbi@yahoo.com

About SIDO

- Many regional offices in mainland Tanzania.
- Four main services
  - Technology development for SMEs
    - Advise on technology
    - See within/outside Tanzania to develop tech (e.g. machine tech)
    - Incubator program (graduate support): incubate SMEs → graduate → other business
    - Tourism cluster
  - Training
    - Entrepreneur, business, finance (credit)
    - Kaizen (improvement) consultation
    - One District One Product (ODOP) strategy (e.g. milk, mayflower and another in Arusha)
  - Supporting marketing information
    - Marketing investment
    - There are information centers at large SIDO offices
    - Free to use the information
    - Promoting product marketing tools
    - Linking organizations (farmers, businesses, local governments etc.)
  - Financial services
    - Credit service (e.g. for purchase of big machines)
    - Max 6.5 million loan
    - Introduce other finance organizations (e.g. banks, government organization)

Small and Medium Enterprises Support, MUVI (Muunganisho Ujasiriamali Vijijini) project

- Support development of value chains increase rural people incomes and reduce poverty.
- Target rural entrepreneurs (including rural poor, women and youth) to improve their skills, knowledge and access to markets
- Covers six regions of Tanzania mainland: Mwanza (paddy and cassava), Manyara (sunflower), Iringa (tomato and another), Ruvuma (cassava), Tanga (citrus and sunflower) and Pwani (pineapple and cassava).
- Support not to use illegal brokers
- Now next MUVI project (MIVARF) ongoing in Arusha (Maize)
- One of the pain points of the projects is infrastructure
Unga Wa Uwele Flour Mill, Arusha SIDO Complex

Name: Edna – Director
Email: nyirefamiltd@yahoo.com
Phone: 255 754 278 149

Background:
• Unga Wa Uwele mills over six different types of grain into flour. They provide Hanh with a brochure that lists their complete product list.
• They have some type of demand forecasting capability as they stated that different flours are in demand throughout the year. They mill based on customer demand and not based on input cost.
• They have outgrown SIDO facilities and SIDO routinely raises their rent to get them to ‘graduate’ to a more permanent facility outside of the SIDO facility. This will allow SIDO to host a less mature company that needs more support in Uwele’s space.
  o Most impressively, they stated they know what demand will be filled with complementary products and what demand will stay stagnant in the market until it is met by a specific manufacturer.

Sourcing of Equipment
• All equipment was Indian made except for the dryer unit which was US made.
  o The dryer was made by Sukup Manufacturing out of Sheffield Iowa
• All equipment was purchased from the manufacturer and shipped via 3PLs to Arusha.
• They did not want to disclose the total cost of equipment (CAPEX required) to us.

Operations
• Process Steps within the Flour Mill
  1. Receiving Grains from Farmers or other Vendors
  2. Destoning/Cleaning – Removes stones and large dirt pieces.
  3. Dehusking the Grain
  4. Hand Washing – The only totally manual step all other steps have some level of mechanization.
  5. Drying
  6. Air Cleaning – Removes small residues and other grains.
  7. Milling
  8. Cooling
  9. Packaging
  10. Distribution – Some done in-house and some through distributors
• Steps 7 to 10 are completed within the warehouse that is roughly 10m x 70m. Steps 7 to 9 have contamination considerations so we were not allowed past a line in the milling room to avoid contamination of the product. These seemed to be required to meet some TBS protocol or standard.
• Uwele has a QA process called Hazard Analysis & Critical Control Point (HACCP) which they said was an international standard. Random sampling used to check on the following:
  o E-Coli check – Checks quality of grain supplies
  o Metals check – Checks both quality of grains and machine maintenance.
  o Oils check – To ensure machines are being kept clean
• They provide lunch for employees as if employees are free for lunch they take a long time to return and do not return together. This appeared to be common within the SIDO compound.
• They only run one shift per day from 8am to 5pm.
• 30 employees can mill 30 tons of flour per month on average.

Other
• Tour was provided by the QA manager
• They have no dedicated sales staff. He manager has sales goals and targets clients outside of working hours.
• They buy inputs during the harvesting season and store them until demand for the product that requires that input present.
SANLITA Products, Arusha SIDO Complex

Contact: Jalita

Background
• Seemed to be a successful manufacturer in the past, but had to switch products due to spikes in input prices.
• Seemed like they wanted us to see the business to invest in it.

Summary of Old Businesses
• Used to be a juice maker and confectionary business but the price of white refined sugar spiked two years ago and turned the business unprofitable.
• Dabbled in the jewelry business, but their mechanically created products couldn’t compete with the low cost of hand made products in Tanzania.
• Played around with cosmetics but they never developed brand recognition to compete against foreign made products.

Current Business
• Animal feed maker using SIDO built equipment. They equipment was rickety, entry level to be PC, but it clearly worked and sourcing parts or coordinating repairs has never been an issue.
• Makes chicken feed which is a cost based business. There are lots of manufacturers and most compete on a cost advantage. Sanlita makes:
  o Starters product – Finer and fortified with vitamins for the chicks
  o Finishers product – Course, and used to fatten adults.
• SANLITA is the contract manufacturer for dog food developed by a vet in Arusha. Sales demand is high, but SANLITA and the vet are waiting for TBS before they can exceed a certain threshold of production. They seemed to know what that mark was, but it was not communicated to the GAP team.
• At the end of the day it seemed like they are awaiting TBS approval to go big with the manufacture of the dog food and they must sustain themselves being the contract manufacturer of that until they can figure something else out. It doesn’t appear that they have a follow-on idea once the dog food market plateau’s.
Swedtan Meat Processors, Arusha SIDO Complex
Contact: Tonny Hannson
E-mail: swedtan@live.com
Phone: 255-753-118-963 or 255-764-697-063

Background
- Tonny lived in Tanzania in the 1980s and early 1990s where he met and married his now wife. In the 1990s they decided to move back to Sweden to raise their children and returned to Tanzania in 2011 or 2012.
- Tonny seems to have very poor business sense, so his company will probably fail although he seems to have a great product and the market potential is there.
- Tonny was clear that he doesn’t know how much longer Swedtan will survive.

Marketing and Sales
- Swedtan’s market is primarily Zanzibar and safari lodges as his product is highly differentiated. All Swedtan processed meat has a Scandinavian flavor to it that is demanded by companies catering to the tourist market.
  - Zanzibar, especially, is in high demand of quality meat. Price is not a limiting consideration for most buyers.
- Meat is in high demand in Dar, Dodoma and the general Arusha market as well, but that seems to be more of a cost decision and has less room for differentiation.
- Most sausage in Arusha is imported from Kenya which is extremely expensive.
- Tonny does his own marketing likely by allowing customers to try a little bit of his products for free.

Inbound and Outbound Logistics
- Tonny located in Arusha likely based on his wife’s preference, however he probably thought the meat processing business was a good candidate for Arusha based on the large Maasai population and their traditional occupation as herders.
- After production Tonny must fly most of his meat to his customers so that it arrives fresh. This is enormously expensive and the price varies based on the destination, although he has enough scale to Zanzibar that his prices should not vary or be surprising to him.
- Shipments to Zanzibar require an export license and import inspection. This adds to the complexity and time associated with new product delivery and the likelihood that product shipped may not arrive fresh to the customer.

Pain Points
- Tonny recently had to reduce head count from 15 to 7 employees to infrastructure difficulties.
- Tonny has had trouble getting customers to pay on time which has stressed his available lines of credit. LOCs already run between 20% to 23%.
- His staff burned out the compressors on one of his freezers so it is now not operable.
TANESCO was conducting maintenance on the line that feeds his shop and sent an
electrical surge that burned out another freezer.
- The total loss of two of four freezers was bad, but will only cost $2k to replace. It
  is unknown why Tonny doesn’t seek out micro-finance to fund repairs.
- The loss of inventory was likely a greater blow to Swedtan as much of that was
  likely purchased on lines of credit. Interest rates on LOCs run between 20% to
  23%.

The tax situation is something that seems to perplex Tonny.
- Swedtan is taxed as a foreign entity although it is domestic.
- New taxes seem to appear out of nowhere.
- Tax authorities don’t use a P&L to determine tax levels. To Tony it seems to be
  based on available cash on hand.
- Taxes are occasionally claimed by force.
- He believes tax authorities follow-up on white owned companies more
  frequently than black owned companies.

Equipment
- Almost all equipment was procured in Sweden and shipped via 3PLs to Tanzania.
  Given Tonny’s background this is probably not replicable by others.
- Roughly $400k in CAPEX was required to launch Swedtan.
- $2k is required for all repairs in the facility.

Other
- Tonny and his wife believe that Tanzania has changed extensively since they left.
  People don’t know how to work and are not trustworthy. He believes this is tied
  to the removal of mandatory national service, where his wife claims Tanzanian’s
  learned how to work.
- Tonny thinks the government actively and deliberately impedes economic
  progress, especially in the tourism sector. Justin believes the issues to be a little
  more complex than how Tonny explained them.
Small Industries Development Organization (SIDO) Dodoma office

Home address: P.O. Box 461, Dodoma, Tanzania
Tel: +255 26 232 1173, +255 754 098 940, +255 715/782 098 940
Contact person: Regional Manager, Abel Xaviery Mapunda
Email Official: dodoma@sido.go.tz
Email Personal: axmapunda@yahoo.com

Discussion of SIDO roles (see the report of SIDO Arusha)
Featured activity in Dodoma region

- Technology support: e.g. support for razor machine from UK
- Assisting business skills for food processing
- Support marketing activities; facilitating the exhibition in Kigoma region in which some financial organizations and SMEs tenant so that these companies and attended companies can be connected.
- 20 companies exhibited in the event last year.
- Financial assistance for SMEs; group loans, individual loans (maximum five million TZS)
- If the max is not enough SIDO connects the SME to other financial organizations.
- 27 companies operating in the SIDO estate in Dodoma: e.g. carpentry, food processing, wine
- SIDO does not actively find companies to be supported: many companies visited SIDO and SIDO chooses from them
- For advertising the SIDO, it uses local radio
- To evaluate companies to be supported, there is no criterion but a form to be filled
- Dodoma region is suitable to cultivate sunflower (not so much rain fall needed), SIDO supporting the processing tech change.
- Assisting tech change is one of the primary activities for SIDO Dodoma such as for Manyara region
- Dodoma is sunflower center
- There is the headquarters of SOBA company, a manufacturer of food processing equipment.
- SIDO has the connection to SOBA and easy to connect to it.
- Sunshine company bought up sunflower seeds last year, leading the shortage of the seeds.
- Popo region: casaba, groundnuts
- Kato company: wine producer in the district of SIDO Dodoma, which founded by Italian
- Wine business is not successful
Bahati/Mabibo Market Meeting

The team met Bahati at the Mabibo Market to learn from traders about the market process and agriculture business insights in Tanzania. We first discussed with Bahati some of the challenges farmers and traders face and what are some of the steps they need to take to be successful. Following our discussion, we went into the market and met with the market director Lazaro, who oversees all the activity.

Bahati Notes:

- Increase technology before increasing productivity
- Educate on technology
- Land belongs to the farmers, not the government
- Trying to shift farmers to commercial farm – making agriculture a business
- TAHA has simplified some things for them by setting up the possibility to find buyers through their pone

Lazaro Notes:

- Sellers come from all over
- Wholesale marketing
- Costs 50,000 Tsh per truck
- 500 Tsh per day to sell
- Farmers already know who is going to buy
- Busiest time: December
- No minimum product needed to sell here
- Mabibo is biggest market in the area
- Tomato is most demanded product and in high supply
- Bananas are very stable
Natural Extracts Industries
Point of Contact: Aarti Mahajan

Three members of the team traveled 2hrs to Moshi, in the Kilimanjaro Region, on May 10th to visit with Natural Extracts Industries. We met with Aarti to discuss NEI business model and value chain as well Kibunje who gave us a tour of their production facility and discussed their operations and R&D.

NEI’s strength lies in their continuously evolving integrated value chain and being able to take on the financial and operational risk of production while still providing value to individual farmers through higher additional income and outreach programs.

Sales
- NEI is the leading natural flavor provider of East Africa
- 85% of NEI’s business is through bulk white label sales to United States and Europe
  - Unable to obtain current customer list
  - Less risky and faster
  - Retail market is not very sustainable
- 85% of sales comes from Vanilla Extract Sales
- Branded products as “Epicurious Hedgehog” (see picture)
- Domestic sales are difficult because baking and flavoring is not traditionally common
- NEI is currently not profitable, unable to acquire their forecasted profitability timeframe

Product
- All packaging materials are locally sourced and mostly recycled materials
- NEI strategy is to start socially, with a story behind their products, then build try to build profitability around that
- Also a cost saving measure
- Vanilla pods are graded, and paid based on grade level
- Only 1% of vanilla in the world is natural
- Gourmet Beans – high quality vanilla pods
  - Quality is defined by size and how green
  - Lower grade vanilla beans are used for extraction

Supply
- NEI owns no farms
- They currently obtain vanilla plants from a network of 1550 farmers throughout the Kilimanjaro and Morogoro Region
- Current NEI vanilla extract demand is 10 metric tons, but they are only able to supply 1 metric ton
- From planting to mature harvest takes three years
- NEI subsidizes 80% of vanilla plants to farmers
- Low supplier power – investing in farmers
Operations

- Farmer “champions” recruit, train, and monitor farmers but are not employees of NEI
  - NEI pays $2 per training per farmer, $1 per field visit (requires 6 per year per farmer), and an unknown compensation for each farmer recruited
- Small group of field agents, employees of NEI, oversee champions and their farmers
- NEI hires part time collection agents during harvest period
- Logistically, truck transport is contracted as needed to move product from collection points to processing facility
  - Farmers have little responsibility to transport far
- Vanilla pods harvested from June to November, when facility utilization is high, December to May, facility utilization is low
  - Have gone into making extracts from orange, coffee beans, cocoa, and cinnamon to provide more work opportunity during the vanilla off season
- High barriers to entry

Facility Operations

- Production and office in one building
- Proceed with safety precautions per Tanzania Food and Drug Authority (TFDA)
- Separate shoes inside and outside

Research and Development

- Current ICT development to improve traceability and forecasting
- In-house research facility to develop new products and test product quality

Future Goals

- Looking to make vanilla sugar
- Partner with more organizations increase farmer network each year
- Local food manufacturers
- Improve economic stability in country
- Organic certification
- Securing funding for expansion of facility

Farmer Relationship

- Seedlings are supplied to farmers at 80% subsidy (20% cost to farmers)
- NEI buys snipped seedlings from mature vanilla plants from its farmers to be able to supply new farmers with seedlings at $2 per seedling
- NEI views it as a partnership during the labor-intensive vanilla farmer process
- Farmers are paid immediately upon delivery of vanilla pods, instant gratification

<table>
<thead>
<tr>
<th>Unknown Costs</th>
<th>Known Costs</th>
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<tbody>
<tr>
<td>Field Agent Salary</td>
<td>Seedling subsidy (per plant, 100,000 distributed in 2016)</td>
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<tr>
<td>Part Time Collection Agent Salary</td>
<td>Champion Consultation (per, amount unknown)</td>
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<tr>
<td>Processing Facility Staff Salary</td>
<td>Champion Field Visit (6 per farmer, per year)</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017 (expected)</th>
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<tbody>
<tr>
<td>Number of Farmers</td>
<td>1550</td>
<td>2350</td>
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<tr>
<td>Revenue</td>
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<td>$270,000</td>
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</table>
Processing Facility Equipment

- **Shanghai Universal Pharmaceutical Machinery Mini Auto Lab Scale Extractor & Concentrator**
- $13,000 - $20,000 based on size
- Were installed by NEI staff, not specialized installation requirements

- NEI has one MTD-100 and one MTD-200 in their facility

<table>
<thead>
<tr>
<th>Model</th>
<th>MTD-20</th>
<th>MTD-50</th>
<th>MTD-100</th>
<th>MTD-200</th>
<th>MTD-300</th>
<th>MTD-500</th>
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<tr>
<td>Extraction volume(L)</td>
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<td>Usual pressure or Negative pressure</td>
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<td>Extract Temperature(ºC)</td>
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<td>Medium</td>
<td>Steam / Hot oil</td>
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![2017 ORDER FORM](image)
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Tanzania Revenue Authority. Web.
