Unlocking Africa's Poverty Trap: Holistic Approach to BOP Investment in Agribusiness

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ABSTRACT

This paper identifies subsistence farming as a significant opportunity for poverty reduction and economic development in sub-Saharan Africa. By taking a holistic, standardized, and bundled approach, this paper proposes an innovative business model that enables smallholder farmers to access affordable extension services, technical assistance and financial scheme, thereby improving their overall productivity level.

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1. Introduction

In sub-Saharan Africa, 64 percent of the 875 million people live in the rural area and they depend on agricultural activity as the primary source of food and income. The majority of them also live in extreme poverty, living under a dollar a day, despite having access to relatively abundant uncultivated land resources they can utilize. In the meantime, food demand is expected to double in the next 25 to 50 years due to rising population, income growth, and urbanization in developing countries, and will outpace the growth in food supply, creating a serious challenge to global food security. Sub-Saharan Africa's subsistence farming thus presents an enormous opportunity for yielding economic growth led by poverty-reduction and subsequently addressing the global food security challenge.

2. Landscape

2.1. Opportunity for Subsistence Farming

Agriculture in sub-Saharan Africa accounts for almost two thirds of the continent's total employment and more than 75 percent of domestic trade, providing the single largest source of food, employment and income for the majority of the African population who are poor and rural. However, agriculture only contributes to 15 percent of the continent's GDP, implying a very low level of productivity in the farms. As demonstrated by the flat slope of the bottom line in Figure 1, sub-Saharan Africa has not been able to close the gap between agriculture's share of the economically active population and the share of agricultural value added in total GDP, reflecting low productivity of labor that has existed over five decades.
The economic opportunity and social impact that will emerge from improving the productivity level of smallholder farmers in sub-Saharan Africa is enormous. On a micro level, the immediate impact of higher productivity of smallholder farmers is an increase in disposable income per household. Newly earned wealth from the farm can be invested in improving education for children, improving diet, improving health, improving housing, and most importantly, continuing to improve the income they earn from farming. On a macro level, higher productivity of smallholder farmers can increase the overall level of output in the agricultural sector and generate new revenue, which, in the long term, plays an important role in financing infrastructure, health, education and other investments that further stimulates the economy. When these linkages begin to function properly, labor can be released from the agriculture sector and migrate to the manufacturing sector. The migration of labor raises productivity in the manufacturing sector and further stimulates the overall economy as represented in Figure 2.

Given this short-term opportunity for poverty-alleviation and long-term opportunity for economic growth, the following section will investigate factors that have hindered the rise in productivity of smallholder farmers in sub-Saharan Africa, who constitute the vast majority of the labor in the agriculture sector. The real economic transformation will only take place in the region when smallholder farmers' unmet needs are addressed and when their productivity is improved.
Currently, smallholder farmers in sub-Saharan Africa labor under extremely challenging conditions. Many grow a diversity of local crops amidst facing unique diseases, pests, and droughts, on an unproductive soil. Lack of access to farming inputs is one major factor that has hindered increased productivity of smallholder farmers. In particular, lack of irrigation system requires most smallholder farmers to be largely dependent on nature’s provision for their crops. As a result, they are
constrained to one or two seasons of crop production. Even if they have access to water during the dry season, smallholder farmers tend to subscribe to irrigation technologies that they can understand and afford, which is, in essence, the traditional manual irrigation where water is hand-carried over a distance by a bucket, a basin, or a jerry can from a well or a surface source and hand poured onto small plots of land.

Today, of a cultivated area of 197 million hectares, only 4.5 percent or 9 million hectares of Africa’s agricultural land is either equipped for irrigation or under some other form of water management. This area amounts to only 23 percent of the 39 million hectares that is deemed physically suitable for irrigation, and 60 percent of this area is concentrated in Madagascar, South Africa and Sudan, leaving the rest of sub-Saharan Africa at a considerably low level of irrigation (Rosegrant 2010).

Both large-scale irrigation schemes and small-scale irrigation schemes are relevant for sub-Saharan Africa, but the economic viability of much of Africa’s potentially irrigable land depends critically on containing investment costs and focusing on higher-value crops. Studies have suggested that well-designed and well-implemented irrigation projects in sub-Saharan Africa can lead to an investment cost of USD 2,000 per hectare or more for small-scale irrigation schemes and USD 3,000 per hectare or more for large-scale irrigation schemes, implying that irrigation investments can only be justified for high-revenue-yielding crops that can yield in excess of at least USD 2,000 to USD 3,000 per hectare annually (Rosegrant 2010). Irrigation investment, in other words, is not sensible for simply growing staple food crops. This excessively high development cost of irrigation schemes in sub-Saharan
Africa has led to failures to capture significantly higher yield levels and cropping intensities, and to transition into production of higher-value crops, ultimately eroding the return on investment.

2.2.2. Fertilizers, Pesticides and Insecticides

In addition to affordable irrigation system, another productivity-enhancing farming input that many smallholder farmers lack is fertilizers. The average use of chemical fertilizer in sub-Saharan Africa is 12.5 kilogram per hectare of arable land, substantially below the global average of 102 kilogram per hectare, and other developing regions, such as Latin America and South Asia, where 89.6 kilogram per hectare and 106.7 kilogram per hectare are applied in respective regions. Even between regions in sub-Saharan Africa, wide disparities exist in levels of chemical fertilizer use with West Africa exhibiting the lowest average level at 10 kilogram per hectare, while East and South Africa apply an average level of 62 kilogram per hectare (Kelly 2005).

Ample evidence suggests the productivity role played by fertilizer. Some studies have contributed 50 percent of yield growth in Asia in the Green Revolution to the use of fertilizer. Others have contributed one-third of the cereal production worldwide to the use of fertilizer. The implied benefit of fertilizer in sub-Saharan Africa is therefore enormous.

For most smallholder farmers, the use of fertilizer depends on three factors: its profitability, the acquisition of the desired amount, and its efficient use. In sub-Saharan Africa, smallholder farmers have had little incentive to use fertilizers because of low output to nutrient ratios, unfavorable input to output price ratios, and
low value to cost ratio. Smallholder farmers are also unable to purchase fertilizers due to low farm incomes, poor access to credit, and lack of market power. As a result, unless they have access to animal manure, which can be applied as top dressing before they plant their crops, most smallholder farmers prescribe to organic farming out of necessity.

2.2.3. Improved Seeds

Another productivity-enhancing farming input that goes hand in hand with fertilizers, but often unavailable to farmers, is improved seeds. Almost all of the countries in sub-Saharan Africa have plant-breeding activities and seed production by state-funded national agricultural research institutes, and seed multiplication, processing and distribution carried out by a wide array of public and private institutions. Regardless, most smallholder farmers in sub-Saharan Africa use saved seeds, which are often times impure in variety and is neither cleaned, dried, tested nor certified.

Similar to other complementary inputs mentioned above, cash constraints prevent smallholder farmers from purchasing improved seeds. As a result, they prefer using saved seeds, which are simple and inexpensive, if not free. The seeds are collected from previous harvest or acquired in local grain markets or exchanged with other farmers through barter, gift, or sales. Even when improved seeds provide superior performance, numerous on-farm studies have suggested that marginal returns of at least 100 percent is often needed to make investment in new varieties attractive to smallholder farmers (Minot 2006).
From the seed producers' perspective, high transactions cost associated with delivery is a challenge. Road infrastructure is poor, building a retail network takes time, and attracting a sizable and consistent seed demand to justify the high transactions cost is difficult. In addition, provision of emergency seed and food aid as a result of frequent disruptions, such as drought and civil disturbance, slows down the rate of seed replacement.

2.2.4. Agricultural Machinery

The final agricultural input that hinders improvement in smallholder farmers' productivity is lack of agricultural machinery, which includes the use of tools, equipment, and machinery for a wide range of farm operations. Typically during the pre-harvesting season, agricultural machinery is used for land clearing, land development, land preparation, soil amendment, irrigation, removing pest, weeding, and planting. During the post-harvest season, machinery is used for on-farm processing, drying, storage, milling, marketing and transporting. While almost every farm operation requires the use of agricultural machinery, the mechanization process from traditional to modern machinery often follows several stages, starting from power-intensive operations that require little control, followed by control-intensive operations, to increased use of mechanically powered technologies, and finally to automation of products.

Sub-Saharan Africa is still at the early stage of agricultural mechanization. Extremely low level of modern machinery is used compared to other parts of the developing world. According to the World Bank, Africa's average use of tractors per 100 square kilometer of arable land is 16 tractors in 2007, which is significantly lower compared to the world average of 215 tractors and even compared with the average for other
developing regions such as Latin America, which uses 107 tractors (World Bank Indicators 2011).

Smallholder farmers in sub-Saharan Africa are simply too poor to employ modern agricultural machinery even with substantial government support. As a result, they are dependent on traditional manual technologies, such as hand tools and draft animals. The mere access to agriculture machinery also remains difficult. There are some small, medium and large-scale enterprises producing agricultural machinery and equipment in Africa, especially in South Africa, Egypt and Nigeria. However, the majority of countries in sub-Saharan Africa relies on imported machinery, equipment and spare parts, and experience long lead times and high maintenance costs before getting into the hands of smallholder farmers.

2.2.5. Processing

Smallholder farmers in sub-Saharan Africa not only lack productivity-enhancing farming inputs, but they also lack the ability to process their produce from the farm. Consequently, even if they had access to expensive farming inputs, farmers risk wasting that investment on post-harvest losses (PHL). Currently, significant volume and quality of staple food is lost after harvest in sub-Saharan Africa. According to estimates provided by the African Postharvest Losses Information System (APHLIS), the value of PHL in sub-Saharan Africa could potentially reach nearly USD 4 billion a year, or 15 percent, out of an estimated annual value of grain production of USD 27 billion (estimated average annual value of production for 2005–07). By removing part of the food supply from the food market, PHL pushes the food price higher and further straps smallholder farmers in cycles of hunger.
The causes of PHL vary country by country. Table 1 presents primary causes of PHL for maize identified by farmers that were surveyed in Kenya, Uganda, and Tanzania in 2008. The table shows that pest infestation, impact of weather, and poor quality of storage facilities are main factors contributing to PHL amongst smallholder farmers.

In order to reduce PHL, smallholder farmers need improved dehydration facilities for their grains, such as racks or cribs, which minimize the damage and maintain the moisture level below 13 to 15 percent – a level that is required to support mold growth during storage. Most smallholder farmers, however, rely on natural drying of crops. Damp weather at harvest time can cause excess of 16 percent in PHL, as witnessed in Swaziland (De Lima 1982). In addition to a dehydration facility, smallholder farmers also need improved on-farm storage facilities so that crops can be dried in well-vented conditions, and can be protected from insects, rodents, molds, thefts, fire and temperature fluctuations. Currently, smallholder farmers face poor storage conditions, if not lack any kind of storage capacity, contributing to PHL.

Table 1: Causes of PHL in percent of total losses

<table>
<thead>
<tr>
<th>CAUSES OF LOSSES</th>
<th>KENYA SMALL</th>
<th>KENYA MEDIUM</th>
<th>KENYA LARGE</th>
<th>UGANDA SMALL</th>
<th>UGANDA MEDIUM</th>
<th>UGANDA LARGE</th>
<th>TANZANIA SMALL</th>
<th>TANZANIA MEDIUM</th>
<th>TANZANIA LARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses due to transporting on poor roads</td>
<td>0</td>
<td>5</td>
<td>11</td>
<td>6</td>
<td>6</td>
<td>13</td>
<td>11</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Lack of storage</td>
<td>6</td>
<td>0</td>
<td>18</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Pest infestation</td>
<td>17</td>
<td>18</td>
<td>25</td>
<td>32</td>
<td>40</td>
<td>50</td>
<td>20</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>Poor quality of storage facilities</td>
<td>20</td>
<td>14</td>
<td>20</td>
<td>16</td>
<td>23</td>
<td>25</td>
<td>20</td>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>Impact of weather</td>
<td>33</td>
<td>58</td>
<td>29</td>
<td>28</td>
<td>10</td>
<td>13</td>
<td>28</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td>Spillage</td>
<td>17</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: World Bank 2009

2.2.6. Market Access

The last mile of subsistence farming is market access. Even with access to agricultural inputs and ability to process agricultural outputs, smallholder farmers will not be able to cash in the value of their investment if they did not have access to the
national, regional and global markets. However, smallholder farmers currently face three critical obstacles: high transaction costs, insufficient information, and an unreliable legal system. As demonstrated in Figure 3, small and medium-sized traders and layers of intermediaries are common before the produce is sold in the market. Along the way, poor road infrastructure, high fuel costs, and outdated trucking fleet and railroad equipment, amplified by roadblocks and bribes, increase the transaction costs. Trader surveys in Benin, Madagascar, and Malawi found out that transportation costs, in fact, account for 50 to 60 percent of marketing cost (Fafchamps, Minten, and Gabre-Madhin 2005). Information on quantities, qualities, and prices of products are also insufficient, if not inaccurate. Delays in obtaining these information or misinterpretation of second-hand information have serious consequences for smallholder farmers, who may end up underselling their products, delivering too little or too much of their products, or having their products wither away. Finally, the farmers face unreliable systems of contract enforcement and dispute adjudication, which hinder trade, particularly when trading across national borders.

Figure 3: Layers of intermediaries characterize Ghana’s maize markets

Source: Natural Resources Institute, personal communication 2008.
In summary, the lack of affordable productivity-enhancing farming inputs, processing, and strong value chain between farm production and market for output are unmet needs that impede smallholder farmers' increased productivity and consequently trap farmers in a cycle of subsistence, poverty and hunger.

3. Key Enablers

3.1. Extension Support

Improving productivity on the farm for most smallholder farmers is an endeavor that cannot be undertaken on their own and not only requires productivity-enhancing extension support, but also requires technical assistance and an innovative financing scheme that enable smallholder farmers to afford and fully take advantage of that which is available.

Ideally, the extension service should include an affordable seed scheme that integrates improved seeds, fertilizers, credit and training in one package to improve the linkage between seed suppliers and smallholder farmers. This has been experimented by programs in the semi-formal sector, and few initiatives, such as the Sasakawa-Global 2000, have shown evidence of success in significantly increasing crop yield in sub-Saharan Africa, especially in Kenya, South Africa and Zimbabwe.

The extension service should also support improved storage structure that is clean, pest-proof, and rodent-proof, such as mud silos, metal drums, and plastic bags. The Bill and Melinda Gates Foundation is currently funding a five-year food-security project called Purdue Improved Crop Storage (PICS), which extends hermetic triple plastic bags of 100 kilogram capacity, each costing around USD 1.8. The objective of
the project is to improve cowpea storage in West and Central Africa and the project has so far reached 28,000 villages in ten different countries, including Nigeria, Niger, Burkina Faso, Ghana, Mali, Senegal, Cameroon, Benin, Togo and Chad (Purdue).

Finally, the extension service should enhance farmers' access to markets. Building on advancement in information and communication technology (ICT), in particular in mobile technology, several innovative approaches catering to specific agricultural functions are being piloted in different parts of the world. One such example is a mobile information platform that delivers information relevant to farmers, such as agricultural techniques, commodity prices, and weather forecasts. Studies have shown the benefits of ICT in promoting access to price information, including increases of up to 24 percent in incomes for smallholder farmers (IC4D 2012). Other examples of extension support that leverages mobile technology to enhance market access are smart logistics that optimizes supply-chain management across the sector and delivers efficiency improvements for transportation logistics, or a mobile trading platform that connects sellers to buyers. In Ghana, a public-private partnership set up TradeNet, an agricultural trading platform that allows sellers and buyers to get into contact over Internet and cell phones, enhancing the link between commodity exchanges traders, buyers, and sellers of agricultural produce.

Once smallholder farmers can access improved seeds, fertilizers, agricultural machinery, processing and market access for growing staple crops, only then can the extension support scheme extend its service to low-cost small-plot irrigation technologies as part of its offering. Affordable irrigation enables farmers to switch from producing staple crops and feeding their families from their produce to growing
high-value cash crops during the dry season and selling them in the market thereby smoothening their consumption. Such irrigation technologies must enable smallholder farmers to access water where it was previously unavailable, to lift and store the water, to distribute water to plants at a plot level, and to use water productively such that they can diversify the crop and produce high-value crops. A variety of smallholder water access and distribution technologies already exist, such as treadle pumps, rope-and-washer pumps, micro diesel pumps and solar-powered pumps with a wide range of distribution methods from simple furrows and watering cans to micro-sprinkler systems and drip irrigation systems. However, what ultimately determines the success of these smallholder irrigation schemes is the farmers’ ability to generate greater returns via higher-value crop production and improved yields; otherwise, farmers will not survive the learning curve and diversification into higher-value crops or export crops will not yield higher output.

3.2. Technical Assistance

There is undoubtedly a need for transmission of knowledge to smallholder farmers about available technologies so that they can ultimately choose the most appropriate technologies for their farms from a pool of available options. Technical assistance is important in order to help smallholder farmers understand and evaluate growth opportunities created from accessing the aforementioned extension services, overcome the steep learning curve, and adopt and adapt new farming practices. It is also valuable to assist and monitor the progress of the farm after the intervention so that smallholder farmers can witness the fruit of their investment from the very first year of harvest.
More fundamentally, educating smallholder farmers is important. According to a study conducted for the World Bank examining the relationship in low-income countries between farmer's education and their agricultural efficiency, four years of education not only contributes to 8.7 percent increase in productivity over those with no formal education, but also contributes to 13 percent increase in productivity where complementary inputs, such as fertilizers, new seeds, and agricultural machinery are available (Canoy 1992). The level of education of smallholder farmers therefore directly relates to the overall level of their productivity. Greater education leads to greater productivity.

In reality, education levels, particularly female education of smallholder farmers in sub-Saharan Africa fall well short of the global standard. In rural areas of sub-Saharan Africa, adult males have about 4 years of education while females have even less education, ranging from 1.5 to 4 years. To prepare smallholder farmers in sub-Saharan Africa to succeed in increasingly knowledge-based agricultural economies linked to global supply chains, education must integrate agriculture into the school curriculum from primary school. The curriculum must respond to the changes in technologies and train resilience in farmers towards a variety of external shocks, including market fluctuations, climate change, droughts, etc. It should also incorporate health and nutrition studies so that farmers have a better understanding of the positive feedback loop between agriculture and health. The curriculum should also include school gardening, which will allow for an experimental learning through a laboratory experience. Finally, the primary school should open up opportunities for on-farm or off-farm small enterprises to encourage more children with education in the agribusiness industry.
Beyond accessing and getting technical training on how to use the productivity-enhancing farming inputs, smallholder farmers, at the end of the day, need sufficient cash to pay for these farming inputs. However, access to financial services is among the top barriers currently facing smallholder farmers. Unlike the large enterprises that can benefit from bank and non-bank credit from commercial and subsidized international finance banks, as well as private equity financing, smallholder farmers cannot benefit from similar type of credit. One option is to get loans from microfinance institutions (MFIs), which is catered to service low-income individuals who typically do not have access to banking services. However, while eligible for small loans, unlike self-employed entrepreneurs and microenterprises who can access the rapidly expanding pool of microfinance funds, smallholder farmers would need loans above USD 5,000 if they were to arrange the above-mentioned farming inputs on their own terms. Given the overly restrictive supervisory, capital adequacy, collateral, and deposit requirements, smallholder farmers are discouraged to access large loans from MFIs. Furthermore, financial services are fewer, less convenient, and more costly in terms of transaction and operating costs in infrastructure-constrained rural areas of sub-Saharan Africa where majority of the smallholder farmers reside. Therefore, as demonstrated in Figure 4, the lack of available rural financing scheme at the “missing middle” disincentives farmers to build relationships with official sources of capital or to develop more formalized transparent operating, disclosure or accounting practices. Finding an innovative model that extends financial services to the poor smallholder farmers is an imperative in improving their productivity level.

3.3. Financial Services

3.3.1. The Missing Middle
3.3.2. Mobile Money

Compared to traditional, informal methods, mobile money is emerging as a cheaper, safer, quicker and more convenient medium for the delivery of financial services to smallholder farmers whose fragile situations require them to finance their extension services, repay debts, save, and manage their risk responsibly in order to improve their livelihoods. McKay and Pickens (2010) found that mobile money was 19 percent cheaper on average than alternative services. The lower cost directly translates into increase in money that smallholder farmers can keep and increase in remittances received from relatives working in urban areas. Mobile money is also safer because it is less visible than cash. Research has found that women are able to have personal savings without seeking permission from their husbands (Morawczynski 2009). Furthermore, mobile money is quicker and has higher liquidity.
Smallholder farmers' limited assets take the form of valuable objects, such as livestock, which are relatively illiquid and difficult to realize quickly in times of crisis.

Mobile money is particularly relevant to sub-Saharan Africa given that mobile penetration in the region increased from 3 percent in 2002 to 48 percent as of 2010, and is expected to reach 72 percent by 2014 (Wireless Intelligence). The most well known system, M-PESA, was developed by Vodafone and launched commercially by the company's Kenyan affiliate Safaricom. M-PESA is a small-value electronic payment and store of value system accessible through mobile phones. To date, M-PESA operates in six countries. Once customers have an individual electronic money account, regardless of their credit history, they can use their phones to transfer maximum USD 500 per transaction to both M-PESA users and non-users, pay bills, and purchase mobile airtime credit for a small, flat, per-transaction fee. M-PESA is not only accessible, but also extremely affordable. One can register and deposit money for free of charge, and no minimum balance is required, removing the adoption barriers for the unbanked farmers. Since its introduction in mid-2007, 20 million users have adopted M-PESA and transferred USD 500 million a month during 2011 (Vodafone Annual Report 2011). Extremely rapid uptake of M-PESA is a strong vote of confidence by large segments of unbanked poor, including smallholder farmers, in the use of new mobile technology to access financial services.

Mobile money holds a significant potential for financial products beyond 'scheduled' and 'on-demand' payments. Safaricom, for example, intends for M-PESA to become a more pervasive retail payment platform, offering formal financial products, such as savings, credit and insurance, as represented by the upward arrow in Figure 5. In
fact, a new form of savings is already in the making. In November 2012, Safaricom introduced a new banking product of M-PESA called M-SHWARI, whereby anyone with a mobile phone in Kenya can save and earn interest. Given that their cash are tied to harvest, smallholder farmers can smoothen their consumption by accessing their savings accounts through M-SHWARI.

Smallholder farmers also need protection against negative external shocks, such as famine, thefts and diseases and they can greatly benefit from affordable insurance schemes that are being developed atop mature mobile money systems. Kilimo Salama, for example, is a micro-insurance product that uses M-PESA to provide payouts to smallholder farmers whose crops fail. In its second year of operation, 12,000 farmers were insured, and 10 percent of them received payouts of up to 50 percent of their insured inputs (Sen and Choudhary 2011).
4. Business Model

In order to capitalize the opportunity behind subsistence farming in sub-Saharan Africa, cash-strapped smallholder farmers require innovative interventions that allow them to access and to afford extension support, technical assistance and financial services. In a practical approach, Kilimo Food offers smallholder farmers in Tanzania with a solution that is financially sustainable and scalable.

4.1. Company Overview

Kilimo Food (or “the Company”) is a for-profit food company in sub-Saharan Africa that exports food commodities to global markets. It procures its natural products by bundling smallholder farmers into producers groups and offering standardized extension services, training and insurance through affordable loans.

4.2. Target Customers and Pain Points

Kilimo Food has two types of customers: smallholder farmers who are the recipients of the Company’s extension services, and global buyers who import the processed food from the Company. Kilimo Food’s first type of customers are smallholder farmers who operate less than 2 hectares of land and rely their income and their source of food on rain-fed farming. Because their produce are harvested only once or twice a year depending on the rain season of the particular region, if they do not have diversified livelihood, these farmers have to survive on one-time income that is generated during the harvest season and are required to spread out that one-time income to the next harvest season.

Due to the seasonality that characterizes subsistence farming, smallholder farmers also suffer from seasonality in food price. Grain prices are lowest immediately after
the main annual harvest, when supplies are high and demands are low. On the contrary, grain prices steadily rise during the dry season and reach its peak just before harvest. On years when the rains are low and erratic, harvests suffer and food prices start rising earlier and more sharply. The grain price will fall sharply as soon as the new produce arrives in the local market.

The first types of customers are also those who typically need to retain the food they produce for subsistence consumption. However, they are sometimes forced to sell their food production at harvest time for low prices. Such needs are not uncommon and arise out of necessity if they have non-food needs, such as accessing healthcare or paying for children’s school fees. In such cases, they will buy back food for consumption in the market when prices are much higher, strapping them into further poverty.

Because they are always constrained by cash, these customers typically cannot access credit that will allow them to purchase productivity-enhancing farming inputs for higher productivity and higher income. Instead, they are restricted to subsistence farming, plagued by post-harvest losses from insect, mold and fungi infestations, and remain vulnerable to famine, drought, and unexpected loss of their families, which place additional pressure on their already tight income.

Kilimo Food’s second type of customer is the buyer of processed food in the global markets. Buyers will include both specialty importers and large companies such as General Mills and Whole Food Markets. Kilimo Food will regularly attend trade
shows and conferences focused on natural products and sustainable trade to
develop partnerships with global buyers.

4.3. Market Opportunity
4.3.1 Geographic Selection
The Company will target Tanzania as its first market entry because it is home to over
3 million smallholder farmers, primarily women, who are locked in marginal
production in their small plots of land. USAID estimates that there are between 4 to
5 million smallholder farmers in Tanzania, of which 70 percent operate on less than
2 hectares each, with 64 percent producing crops alone, 35 percent producing both
crops and livestock, and only 1 percent farming livestock alone (USAID 2009).
Interesting to note that 70 percent of the actual work is undertaken by women (MAFS
2007). Large-scale private sector agricultural operations do exist in Tanzania, but is
limited to about 1,000 operations. The country’s food crop production is therefore
mainly dependent on small-scale subsistence farming. Tanzania is also experiencing
low productivity level per labor amongst farmers. While current agricultural sector in
Tanzania employs 70 percent of the total population, it only accounts for about
45 percent of the GDP (USAID 2009), implying a significant opportunity for Kilimo
Food.

Furthermore, given its diverse geography, ecology, and abundance of arable land,
Tanzania has a potential to achieve high level of sustainable growth in agriculture.
The northern and northeastern regions have bimodal rainfall pattern, consisting vuli,
a short rainy season from October to December, and masika, a longer rain season
from March to May. These regions are known for producing coffee and horticultural
products. The rest of Tanzania has a single rain season that occurs between
December and April. The central and northwest areas are producing sorghum, tobacco, and cotton while the southern region is considered the “breadbasket” for producing most of the marketed maize. Tanzania has a land area of 94.5 million hectares out of which approximately half is arable land. Only 23 percent of the arable land is under cultivation, leaving a largely untapped arable land that the Company can take advantage of.

Finally, the Company believes in using a cashless system and Tanzania is the second country in East Africa after Kenya to rollout Safaricom’s M-PESA. Prior to the launch of M-PESA in April 2008, 54 percent of Tanzanians did not use any form of financial service and only 9 percent of the population had access to formal financial services (FinScope 2006). Furthermore, only 15 percent of the adult population owned a mobile phone and only another 14 percent had access to someone else’s phone. While financial literacy and mobile penetration are low in Tanzania, especially in the rural parts of the country, the Company sees significant opportunity for converting smallholder farmers to mobile banking platform in the future with the backing of M-PESA.

4.3.2 Crop Selection

The Company has chosen maize as its core service product because not only can it be rain-fed, but it is also the most important grain staple in Tanzania in terms of volume, shares of arable land covered, income contribution and calorie intake. Maize, banana, pulses, and potatoes contribute to three fourth of total crops produced in Tanzania with maize contributing the greatest volume as seen in Figure 6. Maize alone is grown in 45 percent of the total arable land and contributes to 50 percent of rural incomes with marketed maize averaging about USD 100 per household.
producing maize in 2008 (USAID 2010). Maize is also the most important staple food in Tanzania in terms of contribution to calorie intake (Table 2). Per capita consumption of maize is 73 kilogram per capita per year, and makes up 33 percent of total calorie intake.

After several successful harvests, the Company plans to train farmers to grow high-value cash crops, such as banana, pulses, potatoes and rice. Registered farmers, on top of maize production during the rain-season, can leverage their dry-season to grow high-value cash crops and extract more income during the year. Paul Polak, in his book “Out of Poverty”, draws on his 25 years of experience in subsistence farming and recommends the following practical approach for deciding which high-value cash crops to grow in a given plot of land. First, he recommends interviewing 50 exemplary farmers and asking them what they made the most income on the previous year. This quickly identifies 15 or more potential crops in each area. After the interview, he recommends conducting a quick analysis of likely future market demand. By interviewing experienced market traders who are making a living from each of the crops, one can weed out the crops with shallow or widely fluctuating market demand and narrow down the initial list of potential crops to the four or five crops that are likely to have sustainable future market demand. Finally, he recommends interviewing regional and government agriculture experts and data banks and identifying one or two new high-value cash crops that can be added to the list.
Figure 6: Tanzania Cropwise Proportional Contribution 2012/13

![Tanzania Crop Contribution](image)

Source: MAFC 2012

Table 2: Tanzania Crop Contribution to Calorie Intake

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Quantity consumed (kg/person/year)</th>
<th>Daily caloric intake (kcal/person/day)</th>
<th>Share of caloric intake (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>73</td>
<td>655</td>
<td>33%</td>
</tr>
<tr>
<td>Cassava</td>
<td>157</td>
<td>298</td>
<td>15%</td>
</tr>
<tr>
<td>Rice</td>
<td>16</td>
<td>154</td>
<td>8%</td>
</tr>
<tr>
<td>Wheat</td>
<td>10</td>
<td>79</td>
<td>4%</td>
</tr>
<tr>
<td>Sorghum</td>
<td>9</td>
<td>79</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>730</td>
<td>730</td>
<td>35%</td>
</tr>
<tr>
<td>Total</td>
<td>1,995</td>
<td>1,995</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Minot 2010

4.3.3 Tractors, Power Tillers and Other Accessories

In Tanzania, about 70 percent of Tanzania’s crop area is cultivated by hand hoe, 20 percent by ox plough and only 10 percent by tractor (RIU 2009). Farming technology is hindered by high cost of hiring mechanization services, shortage of quality machinery, inadequate auto maintenance services and expertise, poor quality of spare parts, fluctuations in fuel prices, inadequate knowledge among smallholder farmers about benefits of mechanization, fragmentation of crop areas leading to high cost of mechanized cultivation, and most significantly, demand and supply deadlocks...
in mechanization hire. Most tractors that are available in Tanzania are imported and being sold at a minimum price of USD 15,000. There is one company based in Arusha, called Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC) that locally manufactures agricultural machinery and sells tractors for USD 11,000, but even these locally manufactured tractors are beyond the reach of smallholder farmers. The acquisition of the tractor is also costly for the Company given the transportation cost and maintenance cost associated with the acquisition. The Company therefore sees an opportunity in sub-contracting tractor drivers who already own the tractors.

4.3.4 Hybrid Seeds

In terms of improved seeds, a variety of improved maize seeds are certified in Tanzania, but not available to smallholder farmers. In 2013, Tanzania's National Seed Committee has certified 22 new hybrid seed varieties that have been developed by a joint effort between public research centers and private seed companies (see Table 3). Of the newly developed seeds, eight are maize seeds (see Table 4). One of the officials disclosed, “NATA H104 maize variety produces 7 to 9 tons of maize per hectare; that is an average of 32 bags of maize per acre” (Nkwame 2013). Despite the potential to double the yield, maize seeds, such as NATA H104 are not available to smallholder farmers in Tanzania. Agricultural Seed Agency, the parastatal organization launched in 2006 under Ministry of Agriculture, Food and Cooperatives (MAFC) who is responsible for the production and distribution of improved seed, is limiting the new seed production due to severe funding issues.
The Company will therefore work with one or two of the private seed companies in Tanzania to procure the improved maize seeds. In particular, the Company sees potential opportunity for long-term partnership with Pannar Seeds Company and East African Seed, given their distribution network within Tanzania and abroad and product coverage that constitutes not only maize, but also other crops.

Table 3: Public and Private Seed Centers Tanzania

<table>
<thead>
<tr>
<th>Public Research Center</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uyole (Mbeya)</td>
<td>Mbeya</td>
</tr>
<tr>
<td>Ilonga (Kilosa)</td>
<td>Kilosa</td>
</tr>
<tr>
<td>KATRIN (Ifakara)</td>
<td>Ifakara</td>
</tr>
<tr>
<td>HORTI Tengeru (Arusha)</td>
<td>Arusha</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Private Companies</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminata Quality Seeds and Consultancy Limited</td>
<td>Tanga</td>
</tr>
<tr>
<td>Tanzania Breweries Limited</td>
<td>Dar es Salaam</td>
</tr>
<tr>
<td>Pannar Seeds Company</td>
<td>Arusha</td>
</tr>
<tr>
<td>Namburi Seed Company</td>
<td>NA</td>
</tr>
<tr>
<td>Bajuta International Limited</td>
<td>NA</td>
</tr>
<tr>
<td>East African Seed</td>
<td>Arusha</td>
</tr>
</tbody>
</table>

Table 4: Tanzania’s Certified Hybrid Seeds in 2013

<table>
<thead>
<tr>
<th>New Seed Varieties</th>
<th>Total New Seed Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>8</td>
</tr>
<tr>
<td>Sorghum</td>
<td>1</td>
</tr>
<tr>
<td>Beans</td>
<td>3</td>
</tr>
<tr>
<td>Cow Peas</td>
<td>2</td>
</tr>
<tr>
<td>Irish Potatoes</td>
<td>4</td>
</tr>
<tr>
<td>Rice</td>
<td>3</td>
</tr>
<tr>
<td>Barley</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total New Seed Varieties</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

*Certified by National Seed Committee
4.3.5 Storage capacity

The most destructive maize storage insects in Tanzania are maize weevils (*Sitophilus zeamis*) and the Larger Gain Borer (*Prostephanus truncates*) (Holst, Meikle, and Markham, 2000). In Tanzania, many smallholder farmers have storage space for maize and other crops in their individual farms, but they are not well designed for long-term storage. Poor conditions cause significant PHL. Erratic and inconsistent drying makes further processing and sorting difficult. Maize, in particular, is vulnerable to rot and pests and losses can exceed 30 percent. The Company will therefore sell the triple-layer hermetic PICS bags with ultra-thick walls of 80 microns and a capacity size of 100 kilogram for USD 5 per bag because it is the most effective and low-cost maize storage technologies to date in the region. As mentioned earlier, PICS bags were originally designed to improve cowpea storage, but PICS' hermetic storage technology has been proven effective for other staple products, including maize, in dramatically decreasing oxygen level through insect, fungal, and seed respiration (Quezada et al. 2006). The PICS bags have useful life of two years and the Company will offer storage space, up to one year, for registered members so that the maize can be shelled and sufficiently dried with little damage for use or sale or seed.

4.3.6 Shelling and Milling

In Tanzania, smallholder farmers cannot command higher price for higher quality of maize because there is no hierarchy of quality standards. Generally accepted quality standards and third party inspection regimes apply primarily to the formal, cross border trade but not to the domestic trade. Thus local grain millers, for example, do not recognize different quality categories for dried maize. Instead, the end consumers decide consignments of the product based on physical inspection at the
point of purchase. This implies that smallholder farmers cannot move up the value ladder from marginal production to more profitable production. Mills also run on electricity and supply of electricity is an issue in Tanzania.

Kilimo Food thus sees an opportunity in setting up a medium-size maize milling plant in Dar es Salaam to undertake maize flour milling at a capacity of 25 tons per day where the Company will collect the maize from all the K-Points and process into maize flour. While locally manufactured maize flour milling machine would be ideal, the Company intends to import maize flour milling machines from a Chinese flour milling manufacture that can install the machine at a low cost. The milling plant will consist of lifting, cleaning, coarse crushing and embryo removing, milling, sifting and packing.

4.3.7 Transport and Handling

Majority of the maize produced by smallholder farmers are consumed by the households, but if there is surplus, the maize will either be stored or be sold to village collectors and to large traders via brokers after processing it through the village posho mill as described in the maize marketing value chain in Tanzania in Figure 7. The incidence of loss and damage experienced by maize traders, however, is relatively high. Approximately 3 percent of maize inventory is lost in each transfer and handling. On average, 5 or 6 handlings take place between farms and retail markets or mills. Thus only 85 percent of the grain initially harvested and sold finds its way into the retail market, excluding losses during storage (USAID 2010). The Company, therefore, sees an opportunity in short cutting the middlemen and controlling every point of the value chain from production to final sale. The Company
plans to establish relationships with trusted buyers, such as General Mills and Whole Food Markets, who will make direct purchasing orders to Kilimo Food.

Figure 7: Tanzania Maize Marketing Value Chain Mapping

Source: USAID 2009
4.4 Solution

4.4.1 The Kilimo Food Model

Kilimo Food will bundle smallholder farmers into producers group unit called “K-Point” and will offer standardized extension services and training to farmers in the form of short-term one-year loans. K-Point’s operating model will be complemented by extensive training of Field Agents, who will provide a complete extension package for a much broader universe of smallholder farmers using economies of scale and implementation of rigorous monitoring and quality control based on data driven management across the network of K-Points. At scale, Kilimo Food’s critical focus on the cost effective service delivery of its model and research-based allocation of services will allow each K-Point franchisee to run a group of smallholder farmers on a profitable basis, while maintaining a financially sustainable business model at the central network level.

Kilimo Food’s value proposition will be three-folds: its bundling approach, its franchise-like business model and its holistic service to farmers. Smallholder farmers generally lack the understanding, unity and initiative to self-organize themselves into producers group and address their various needs and challenges towards increased agricultural production. Kilimo Food therefore intervenes and empowers them collectively by forming producers groups. By grouping the farmers together and by aggregating their output, Kilimo Food will help farmers realize price benefits from quantity discounts in purchasing fertilizers and improved seeds and transporting them. Mobilizing the farmers will also allow farmers to aggregate the areas of cultivation and to access mechanized services from tractor owners for a discounted
price. Similarly, the Company will also allow farmers to join forces to produce necessary volume to satisfy the demand from reliable agro-businesses or commodity wholesalers, who require certain volume to reduce transaction cost. By meeting the volume requirement of major buyers, smallholder farmers will be able to increase bargaining power. Finally, by coming together, smallholder farmers can pool their risk and access different types of insurance schemes, protecting each other from negative external shocks.

Kilimo Food will also leverage a franchise-like model in order to meet the needs of agricultural development on a large scale while also meeting the acute local needs. By franchising, Kilimo Food, the franchisor, will have an advantage of creating a standardized service and product – producers will know that extension services at Kilimo Food is consistent and credible and consumers will know that products from Kilimo Food are safe and reliable. The small entrepreneurs that become K-Point franchisees, on the other hand, are best able to organize and manage individual agents at each K-Point. A franchisee is likely to have much better knowledge about local crops, local farmers, and local food markets compared to a national organization, and will be better able to hire and manage the staffs at K-Point.

Few organizations have practiced social franchising model to deliver public goods and services, such as health care and education, in low-income markets. The best-known examples are The Healthstore Foundation's (HSF) chain of 85 micro-clinics in Kenya and Rwanda; VisionSpring's network of trained “vision entrepreneurs” who sell eyeglasses to low-income consumers in rural India; and Living Goods' Avon-style distribution of health and consumer products to peri-urban markets in Uganda.
through community health promoters. These chains were all started with grant capital, thereafter seeking to rapidly replicate a standardized service with diminishing grants subsidies. However, no one has yet created a proven, self-sustaining model that can meet the needs on a large scale. Based on past practices, Kilimo Food realizes the importance of developing, iterating, and proving a profitable, replicable business model at the unit level before franchising, and will therefore wait until the first K-Point in Tanzania achieves profitability before opening other K-Points in rest of Tanzania and other countries in sub-Saharan Africa.

Most importantly, Kilimo Food will be established based on the premise that smallholder farmers' productivity cannot be maximized without offering a holistic solution to farmers' unmet needs along the entire agriculture value chain. While there have been many organizations and initiatives in the past that promote the dissemination of appropriate technologies, they only address one or two of farmers' unmet needs. As such, Kilimo Food will not only provide affordable productivity-enhancing inputs and processing, facilitated by technical and financial assistance, but will also give the last mile delivery in agriculture, which is market access.

This underlying belief is shared by organizations, such as One Acre Fund, who also helps one-acre subsistence farmers in Kenya, Rwanda and Burundi achieve permanent gain in farm income. As such, One Acre Fund provides farmers with a complete service, or a "market bundle", which consists of five components. First component is identifying a local farmer group. Second component is education. Third component is capital. Fourth component is market facilitation, and the final component is crop insurance. In its seventh year, One Acre Fund is concentrating its
effort in market facilitation, which is one component of the market bundle that has been less effective than others. One Acre Fund will inarguably be the closest competitor to Kilimo Food as it expands into Tanzania, but the Company believes that given the substantial opportunity in subsistence farming in sub-Saharan Africa and limited players that currently cater to the region’s smallholder farmers, Kilimo Food and One Acre Fund can only learn from each other and collaborate to build best practices in the sector.

4.4.2 Farm Operations

Kilimo Food requires all registered farmers to strictly follow the Company’s farming method. Information session will be given at a community gathering area (e.g. churches, bus stations, markets) around the third week of October, taking into consideration that seed planting takes place in December. Field Agents will explain about the extension services offered by K-Point, as well as instructions on the mobile billing system and affordable insurance system that K-Point requires all farmers to enroll. Crop insurance, which is one of the two mandatory insurance schemes, will protect smallholder farmers against losses from extreme drought and excess rainfall. Kilimo Food will partner with Syngenta Foundation so that smallholder farmers can access Africa’s largest agricultural insurance program called Kilimo Salama. When a smallholder farmer purchases bags of maize seeds and fertilizers from K-Point, he or she also pays 10 percent of input cost in Kilimo Salama. The Field Agent will register the insurance purchase by scanning a code using a mobile phone application. The message will go to a cloud-based server that administers the policies. It will then send the smallholder farmer an automated SMS with his or her policy number. Syngenta Foundation has solar-powered weather stations that collect the weather data. At the end of each growing season, the data will be compared.
automatically to a weather index based on historical weather data. If the rainfall in that particular season is 15 percent above or below the average, the insurance payout owed to registered farmers will be calculated and sent via automated mobile payment. To date, this crop insurance system is best of its kind in the region because there is no "claims" process. The entire transaction is automated and cashless. K-Point also requires every registered farmer to enroll in funeral insurance. Funeral expenditure is substantial part of farmer's income. At the cost of USD 2 per each member of the family, funeral insurance will ensure that any outstanding credit will be forgone in the event of member's death or their family's death. The family member will get a payout that is conditional on the relationship of the family member to the deceased. The payout for the spouse will be USD 50, and the payout to the children will be USD 10 per child. Families will be required to obtain death certificates in order to process the claim.

Registration for K-Point will take place during the fourth week of October, approximately one week after the information session. Interested farmers must arrive with acceptable forms of personal identification (e.g. passport, pension card, voters registration card, or a letter from the village / ward executive officer that includes a photo and an official stamp) and fill out a registration form to sign up for M-PESA. Smallholder farmers must be a Vodacom customer and over 18 years of age. Registering with M-PESA will allow cashless transactions, including deposit and transfer between smallholder farmers and K-Point. During registration, smallholder farmers will also enroll in crop insurance and funeral insurance. Registration for funeral insurance will entail data entry of client and beneficiary information.
In the first week of November, K-Point will host its first training where registered farmers will buy bags of fertilizers and hybrid seeds from K-Point. The farmer will be able to choose the variety for his or her farm, depending on his or her preference of maturity. For example, some maize seeds are for very early maturing, which can be effective for late planting. Other seeds have medium maturity for longer seasons or early planting in short season areas. Field Agents will be equipped to give recommendations to farmers on the most appropriate seeds and fertilizers for their farm. After procuring the seeds and fertilizers, Field Agents will give training on field preparation. Field Agents will introduce Kilimo Food Planting Manual, a standardized manual that covers academic learning on soil management. This manual also covers procedures for holing out the fields at a given spacing associated with the type of seed and rainfall pattern of the specific region and procedure for applying fertilizers. The training session will conclude with a demonstration of fertilizer application and hands-on learning.

After the first training session, farmers will return to their respective farms and apply the fertilizer based on Kilimo Food Planting Manual. Field Agents will subsequently go around during the third week of November to audit the registered farms. During the audit, Field Agents will give instant feedback to the farmers and score the performance of fertilizer appliance, which will be texted back to Kilimo Food.

In the fourth week of November, second training session will take place at K-Point. The second training session will entail procedures for planting seeds. The second training will also include demonstration of fertilizer appliance and hands-on learning. After the second training, registered farmers will await for a text message by K-Point.
who will announce the “Planting Day”. Planting Day will typically coincide with the first rain in December. During December, K-Point will continue to send farming tips via text message, such as “Prepare tied ridges to conserve rainfall and soil erosion”, “Remove small weeds”, etc. Field Agents will conduct the second audit during the third week of December, where farmers will be given instant feedback. Performance will be again scored and reported back to Kilimo Food via text message.

During the fourth week of January, K-Point will send a final text message to its farmers, instructing them to top dress maize when it has six leaves. By March, registered farmers will be ready to harvest the maize.

Once the maize is harvested, the smallholder farmers will have three options. First option is to immediately use the harvest for household consumption. Alternatively, if they have surplus, registered farmers can purchase the PICS bags for USD 5 per bag of 100-kilogram capacity and store their maize at K-Point for up to one year. This is a cheap alternative for farmers who want to spread out their consumption of their harvest throughout the year. This allows farmers to avoid price fluctuations of maize, guarantee access to maize supply throughout the year without spoiling it, and potentially cash-in the profits from their harvest later in the year when maize supply in the market is low and price of maize is high. If the farmers need the cash immediately due to emergency needs, the third option is to sell the harvest at K-Point. Rather than selling the produce to local village collectors at an unreliable price or an unreasonably low price, the Company uses transparency mobile application called M-Farm to enable registered members to sell their maize at the same retail price that is sold in the nearest city. Smallholder farmers can simply SMS the number “3555” to
get the information pertaining to the retail price of maize. By showing the retail price obtained by M-Farm at the K-Point counter, the small farmers can sell their maize at an accurate retail price without incurring the transportation cost from their farm to the nearest city. By selling their maize at K-point, smallholder farmers also simultaneously buy the right to repurchase the maize at the same price at a later time. This incentivizes smallholder farmers to sell any residual maize right after post-harvest season when prices are still low and to repurchase those maize at a later time when maize are scarce and prices are high.

4.4.3 Field Manager

An individual Field Manager trained and selected by Kilimo Food will run each K-Point franchisee. While Field Manager will be responsible for the performance of his or her farming group, all of the farming units will be owned by and falls under the responsibility of Kilimo Food. Field Managers will report to and will be held accountable by Kilimo Food for every aspect of the farming group. Field Manager will manage the farming group based on the systems, processes, and guidelines that are established by Kilimo Food. Field Manager will follow a detailed manual, which outlines how to manage the K-Point's finances, Field Agents, tractor driver, as well as registered farmers.

There will be an 8-week training program for recruiting Field Managers. The curriculum will be more operational than technical, reflecting Field Manager's responsibility. Field Managers are expected to earn USD 2,500 a year, and in addition, he or she will get paid for sick leave, health insurance, and social security contributions.
4.4.4 Field Agents

Like K-Point Field Managers, all K-Point Field Agents will also be required to complete an intensive 8-week training program, but unlike Field Manager training, the curriculum will be more technical than operational. The training program will include an intensive full-time induction course that covers M-PESA registration, funeral and famine insurance registration, Kilimo Salama and mFarm applications use, and most importantly, learning the content of Kilimo Food Planting Manual. Three weeks into the training program, with input from training staff, one or two trainees will be offered jobs at Kilimo Food as K-Point Field Agents. All Field Agents will be required to become M-PESA agents to conduct M-PESA registration of smallholder farmers autonomously. Field Agents are expected to earn USD 1,500 a year, plus the same benefits as the Field Manager. Kilimo Food will also provide K-Point Field Agents with “scripted” procedures for registration, hosting trainings, price verification, and repurchase of maize.

4.4.5 Tractor Driver

In addition to Field Manager and Field Agents, Kilimo Food will also find and hire a local tractor owner on a short-term contract. The advantage of hiring a local tractor owner is the existing relationship he has with the farmers in the region and the driving expertise he brings to Kilimo Food. Kilimo Food will offer ploughing service for USD 10 to 25 per acre with a price reduction associated with the area of cultivation and the intensity of cultivation. Plots of land that are adjacent to each other will receive price reduction. This incentivizes farmers to mobilize and bundle demand. On the other hand, cultivating virgin or fragmented plot will be more expensive. Tractor driver will have a standard percentage mark-up to be charged for
different services. For example, 15 percent mark-up for virgin-plot and 10 percent mark-up for non-virgin plot.

4.5. Price

K-Point’s extension service will include 8 kilogram of improved seeds and 70 kilogram of fertilizer per acre per registered farmer, distributed at the beginning of the planting season and covered by crop insurance. The extension service will also include a tractor service. The loan will have terms of up to one year and will be oriented around a production cycle or harvest. The expected loan will be around USD 200 per acre per year. For a 2-acre farmer, this is equivalent to USD 34 per month in monthly repayments, renewed annually.

Interest rates on Kilimo Food’s loans will range from 8 percent to 12 percent. Kilimo Food, however, will take into consideration a variety of factors when determining interest rates, including its cost of capital, operating costs, the risks associated with each loan, and the rates charged both by local financial institutions, local commercial banks, and by other social finance lenders.

In addition to crop insurance, which is automatically included in the extension package, registered farmers will also obtain funeral insurance, which will cost USD 2 per family member of registered farmer and paid upfront upon registration. Enrollment will be mandatory for all registered members, and renewed every year. At the end of harvest, registered farmers will have an option to store their surplus at K-Point, in which case they are required to purchase PICS bags for USD 5 per 100-kilogram bag.
4.6. Financial Overview

4.6.1 Kilimo Food Financial Statement

Kilimo Food’s financial shows a rapid sales growth in its early life cycle as the Company expands its K-Point from one K-Point in its first year to six by its fifth year (see Figure 8). Kilimo Food requires initial investment to set up the maize milling factory in Dar es Salaam, source skillful Field Managers and Field Agents, and build a production line and quality assurance that can meet the future demand of global buyers. As shown in Figure 9, Kilimo Food expects to turn profitable by Year 5 at the latest.

Revenue: The Company has two revenue streams. The revenue generated from K-Point’s short-term loans and the revenue generated from maize flour sale. Approximately 40 percent of its revenue will be generated from K-Point while about 60 percent of its revenue will be generated from maize flour processed at the milling plant in Dar es Salaam. Kilimo Food will process the maize purchased from K-Point farmers into maize flour and sell the maize flour for USD 1 per kilogram to the Company’s trusted buyers, such as General Mills and Whole Food Markets.

Cost: The Company’s biggest operating expense is overhead. The Company assumes that the compensation for the global team, which consists of CEO, CFO, Head of Global Talent, Head of Operations, and Head of R&D, will be USD 60,000 annualized and will remain flat until the Company turns profitable, which, according to the Company’s forecast, will be on Year 5. From Year 3, the Company anticipates adding additional staff in Global Talent, Operations and R&D Departments as the Company continues to expand the number of K-Points and
prepares for its first country expansion. The Company’s global office will be based in Cambridge, USA and it will allocate USD 24,000 annualized in budget for renting an office space in Cambridge.

Figure 8: Financial Statements of Kilimo Food

Kilimo Food: Financial Statements (all financial figures are stated in USD)

### Income Statement

<table>
<thead>
<tr>
<th>Kilimo Food Summary (EDY)</th>
<th>Year 1</th>
<th>% Rev</th>
<th>Year 2</th>
<th>% Rev</th>
<th>Year 3</th>
<th>% Rev</th>
<th>Year 4</th>
<th>% Rev</th>
<th>Year 5</th>
<th>% Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td># Countries</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td># New K-Point</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td># Total K-Point</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td># Total Farmers</td>
<td>50</td>
<td>150</td>
<td>300</td>
<td>500</td>
<td>750</td>
<td></td>
<td></td>
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<tr>
<td># Family Members</td>
<td>200</td>
<td>600</td>
<td>1,200</td>
<td>2,000</td>
<td>3,000</td>
<td></td>
<td></td>
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</tr>
<tr>
<td># Total Acres</td>
<td>100</td>
<td>300</td>
<td>600</td>
<td>1,000</td>
<td>1,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Maize Bags Produced</td>
<td>1,500</td>
<td>4,500</td>
<td>9,000</td>
<td>15,000</td>
<td>22,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Maize Bags Consumed</td>
<td>750</td>
<td>2,250</td>
<td>4,500</td>
<td>7,500</td>
<td>11,250</td>
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<td></td>
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<tr>
<td># Maize Bags Stored</td>
<td>375</td>
<td>1,125</td>
<td>2,250</td>
<td>3,750</td>
<td>5,625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Maize Bags Sold</td>
<td>375</td>
<td>1,125</td>
<td>2,250</td>
<td>3,750</td>
<td>5,625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Revenues/Income

- K-Point Level Revenue: 22,195 (37%)
- Operating Expenses: 17,985 (37%)
- Interest Expense: 358,170 (63%)
- Total Revenue: 59,695 (100%)

### Operating Expenses

- Headcount (excl K-Point): 5
- Headcount K-Point: 7
- R&D: 1
- Compensation: 60,000 (101%)
- Other: 1,000 (2%)
- R&D Total: 61,000 (102%)
- Operations: 1
- Compensation: 60,000 (101%)
- Training: 2,000 (3%)
- Franchising Total: 62,000 (104%)
- G&A: 3
- Compensation: 180,000 (302%)
- Rent: 24,000 (40%)
- G&A Total: 204,000 (342%)

### K-Point Level Expenses

- Headcount (FM): 1
- Headcount (FA): 5
- Headcount (TD): 1
- FM Compensation: 2,500 (4%)
- FA Compensation: 7,500 (13%)
- TD Compensation: 500 (1%)
- Seed Purchasing Expense: 200 (1%)
- Fertilizer Purchasing Expense: 60 (9%)
- Insurance Payout: 122 (2%)
- Maize Bag: 750 (1%)
- Supplies: 500 (1%)
- Utilities & Maintenance: 1,000 (2%)
- Marketing: 1,000 (2%)
- K-Point Level Total: 3,217 (39%)

### Total Operating Expenses

- 350,147 (587%)
- Operating Income (EBITDA): 290,452 (-487%)
- Interest Expense: -
- Income Tax Expense: -
- Depreciation: -
- Net Income: 290,452
4.6.2 K-Point Unit Economics

K-Point’s unit level financial, on the other hand, shows that K-Point will reach its financial sustainability in Year 2 if it can achieve registration of 100 smallholder farmers. The sales growth will plateau in Year 4, however, when K-Point reaches its maximum capacity of 200 registered farmers and Farmer-to-Field Agent ratio of 40 registered farmers per Field Agent (see Figure 10).

Revenue: Assuming that an average K-Point farmer owns 2 acres of farm, and that the farmer, thanks to Kilimo Food’s extension services, can produce 15 maize bags per acre per year, K-Point will generate 90 percent of its revenue from loan repayments. The remaining 10 percent of revenue will be generated from sale of PICS bags and funeral insurance premium.

Cost: At the unit level, the biggest operating expense of K-Point is maize repurchase, which constitutes 40 percent of total sales. This is assuming that the company will be able to purchase the maize from its smallholder farmers at USD 25 (TSH 40,000) per 100-kilogram bag based on the five-year average of maize price in Tanzania.
practice, the registered farmers will be selling their maize based on the retail price of maize reflected on mFarm, and like other crops, maize price in Tanzania will be seasonal and therefore lowest around the time of harvest and highest right before harvest. As shown in Figure 11, in February and March 2012, the price of maize was at the five-year average of USD 25 (TSH 40,000) per bag, while the price of maize doubled by the end of the year depending on the city. In Dar es Salaam, the economic capital, and Dodoma, the political capital, the price of maize reached USD 50 (TSH 80,000) per bag in 2012, while in smaller cities such as Arusha and Songea, the price of maize only reached USD 35 (TSH 60,000) per bag. The price of maize also fluctuates sensitively to extreme weathers. In 2012, for example, Tanzania experienced significant hike in maize price due to drought, which wiped out the supply. The Company therefore anticipates the maize repurchase to vary significantly year to year. The Company should be able to offset the volatility in maize price with volatility in maize flour price, which are highly correlated.

The second biggest operating expense is seed and fertilizer procurement, which constitutes about 25 percent of sales. This assumes that registered farmer will require 8 kilogram of maize seed and 70 kilogram of fertilizer per acre per one harvest season at a cost of USD 2 per kilogram and USD 0.6 per kilogram respectively.

The overhead cost, which includes compensations for Field Manager, Field Agents, and Tractor Drivers, constitutes 40 percent of sales in Year 1, but is expected to decline to 10 percent of sales by Year 5 as registered farmers in each K-Point reaches full capacity.
### Income Statement

K-Point Summary (EOY)

<table>
<thead>
<tr>
<th>K-Point Summary (EOY)</th>
<th>Year 1 % Rev</th>
<th>Year 2 % Rev</th>
<th>Year 3 % Rev</th>
<th>Year 4 % Rev</th>
<th>Year 5 % Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td># Farmers</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>220</td>
</tr>
<tr>
<td># Family Members</td>
<td>200</td>
<td>400</td>
<td>600</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td># Acres</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td># Seed (kg)</td>
<td>800</td>
<td>1,600</td>
<td>2,400</td>
<td>3,200</td>
<td>3,200</td>
</tr>
<tr>
<td># Fertilizer (kg)</td>
<td>7,000</td>
<td>14,000</td>
<td>21,000</td>
<td>28,000</td>
<td>28,000</td>
</tr>
<tr>
<td># Maize Bags Produced</td>
<td>1,900</td>
<td>3,000</td>
<td>4,000</td>
<td>6,000</td>
<td>6,000</td>
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<tr>
<td># Maize Bags Consumed</td>
<td>750</td>
<td>1,500</td>
<td>2,250</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td># Maize Bags Stored</td>
<td>375</td>
<td>750</td>
<td>1,125</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td># Maize Bags Sold</td>
<td>375</td>
<td>750</td>
<td>1,125</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td># Field Managers</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td># Field Agents</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<td>5</td>
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<tr>
<td># Tractor Drivers</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td># Farmers</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Farmer FA Ratio</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>40</td>
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</table>

### Revenues

<table>
<thead>
<tr>
<th>Revenues</th>
<th>Year 1 % Rev</th>
<th>Year 2 % Rev</th>
<th>Year 3 % Rev</th>
<th>Year 4 % Rev</th>
<th>Year 5 % Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan (acre)</td>
<td>19,920</td>
<td>39,840</td>
<td>58,780</td>
<td>79,680</td>
<td>79,680</td>
</tr>
<tr>
<td>Seed Sale</td>
<td>14,000</td>
<td>28,000</td>
<td>42,000</td>
<td>56,000</td>
<td>56,000</td>
</tr>
<tr>
<td>Fertilizer Sale</td>
<td>1,000</td>
<td>2,000</td>
<td>3,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Tractor Service</td>
<td>1,720</td>
<td>3,440</td>
<td>5,160</td>
<td>6,860</td>
<td>6,860</td>
</tr>
<tr>
<td>Crop Insurance Premium</td>
<td>400</td>
<td>800</td>
<td>1,200</td>
<td>1,600</td>
<td>1,600</td>
</tr>
<tr>
<td>Maize Bag</td>
<td>1,875</td>
<td>3,750</td>
<td>5,625</td>
<td>7,500</td>
<td>7,500</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>22,195</td>
<td>44,390</td>
<td>66,585</td>
<td>88,780</td>
<td>88,780</td>
</tr>
</tbody>
</table>

### Operating Expenses

<table>
<thead>
<tr>
<th>Operating Expenses</th>
<th>Year 1 % Rev</th>
<th>Year 2 % Rev</th>
<th>Year 3 % Rev</th>
<th>Year 4 % Rev</th>
<th>Year 5 % Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Manager Compensation</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Field Agent Compensation</td>
<td>7,500</td>
<td>7,500</td>
<td>7,500</td>
<td>7,500</td>
<td>7,500</td>
</tr>
<tr>
<td>Tractor Driver Compensation</td>
<td>200</td>
<td>400</td>
<td>600</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Seed Purchasing Expense</td>
<td>1,600</td>
<td>3,200</td>
<td>4,800</td>
<td>6,400</td>
<td>6,400</td>
</tr>
<tr>
<td>Fertilizer Purchasing Expense</td>
<td>4,200</td>
<td>8,400</td>
<td>12,600</td>
<td>16,800</td>
<td>16,800</td>
</tr>
<tr>
<td>Maize Repurchasing Expense</td>
<td>9,375</td>
<td>18,750</td>
<td>28,125</td>
<td>37,500</td>
<td>37,500</td>
</tr>
<tr>
<td>Insurance Payout</td>
<td>40</td>
<td>80</td>
<td>120</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Maize Bag</td>
<td>750</td>
<td>1,500</td>
<td>2,250</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Total Operating Expenses</td>
<td>26,165</td>
<td>42,330</td>
<td>58,495</td>
<td>74,660</td>
<td>74,660</td>
</tr>
</tbody>
</table>

### Net Income (Loss)

<table>
<thead>
<tr>
<th>Net Income (Loss)</th>
<th>Year 1 % Rev</th>
<th>Year 2 % Rev</th>
<th>Year 3 % Rev</th>
<th>Year 4 % Rev</th>
<th>Year 5 % Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3,970)</td>
<td>-18%</td>
<td>2,060</td>
<td>8,090</td>
<td>14,120</td>
<td>14,120</td>
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</table>

### Cumulative Capex

<table>
<thead>
<tr>
<th>Cumulative Capex</th>
<th>Year 1 % Rev</th>
<th>Year 2 % Rev</th>
<th>Year 3 % Rev</th>
<th>Year 4 % Rev</th>
<th>Year 5 % Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-point Construction</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Land Purchase</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Total Capex</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

### Figure 11: Maize Price in Tanzania

Source: Tanzania Price Bulletin, March 2013
4.6.3 Capital Considerations

Kilimo Food needs to raise USD 600,000 in Year 1 and an additional USD 300,000 in Year 3 to reach scale quickly, depending on assumptions. The primary drivers of equity required are initial workstation facilities for global staffs in Cambridge, USA, maize milling facility for each operating country, and construction and land acquisition for each K-Point (see Figure 12).

Figure 12: Capex and Cash Flow

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beginning Cash</strong></td>
<td>$ -</td>
<td>$ 295,548</td>
<td>$ 85,242</td>
<td>$ 122,680</td>
<td>$ 40,460</td>
</tr>
<tr>
<td><strong>Gross Margin</strong></td>
<td>$ 59,695</td>
<td>$ 179,085</td>
<td>$ 358,170</td>
<td>$ 596,950</td>
<td>$ 895,425</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td>$(350,147)</td>
<td>$(386,391)</td>
<td>$(617,732)</td>
<td>$(676,170)</td>
<td>$(759,755)</td>
</tr>
<tr>
<td><strong>Investment</strong></td>
<td>$ 600,000</td>
<td>$ -</td>
<td>$ 300,000</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Capital Expense</strong></td>
<td>$(14,000)</td>
<td>$(3,000)</td>
<td>$(3,000)</td>
<td>$(3,000)</td>
<td>$(13,000)</td>
</tr>
<tr>
<td><strong>Change in Cash</strong></td>
<td>$ 295,548</td>
<td>$(210,306)</td>
<td>$ 37,438</td>
<td>$(82,220)</td>
<td>$ 122,670</td>
</tr>
<tr>
<td><strong>Ending Balance</strong></td>
<td>$ 295,548</td>
<td>$ 85,242</td>
<td>$ 122,680</td>
<td>$ 40,460</td>
<td>$ 163,130</td>
</tr>
</tbody>
</table>

**Capital Expenses**

- **Employee Workstations (PP)**: $ 1,000, $ - , $ - , $ - , $ -
- **B-Point Construction**: $ 1,500, $ 1,500, $ 1,500, $ 1,500, $ 1,500
- **Land Purchase**: $ 1,500, $ 1,500, $ 1,500, $ 1,500, $ 1,500
- **Maize Milling Facility**: $ 10,000, $ - , $ - , $ - , $ 10,000
- **Total CAPEX**: $ 14,000, $ 3,000, $ 3,000, $ 3,000, $ 13,000
- **Cumulative CAPEX**: $ 14,000, $ 17,000, $ 20,000, $ 23,000, $ 36,000

5. Enabling Conditions

The success of Kilimo Food is preconditioned on the innate region-specific and country-specific factors, such as macroeconomic climate, public policy, regulations, good public governance, basic infrastructure and market dynamics.

5.1. Public Policy and Regulations

While the first five decades of post-independence Africa has been nothing but backwards, there have been winds of change and African governments are now
making continent-wide political commitment that is backing the push for agriculture-led development. Comprehensive Africa Agriculture Development Programme (CAADP), for example, was launched in 2003 and endorsed by African governments and major development partners to set ambitious goals in agricultural investment and to encourage evidence based policy planning. In 2004, member states of the African Union (AU) committed to achieving an average 6 percent annual growth rate of agriculture and pledged a minimum of 10 percent allocation of public expenditures to the agricultural sector, and in 2009, the G-8 meeting in L'Aquila, Italy renewed donor commitments to CAADP (African Union & NEPAD 2004; G-8 2009).

As Kilimo Food expands organically, alignment with public policies and regulations and building social capital both at the national level and regional level become increasingly important for scaling.

5.2. Stable Macroeconomic Climate

Except for select countries that have attained middle-income status, economic growth in sub-Saharan Africa has staggered until mid-1990s, inviting very little foreign investment into agriculture. It is only recently that, with the economic growth exceeding 5.5 percent and agricultural growth exceeding 3.5 percent, a sense of optimism has revived about the prospects for Africa's agriculture and rural development. However, the region still ranks at the bottom in terms of business climate, and macroeconomic stability remains a challenge for many sub-Saharan African countries suffering high inflation, high budget deficits, and high monetary growth. As macroeconomic instability significantly deters foreign investment, entering a country with stable macroeconomic climate is a prerequisite for Kilimo Food's success, both in terms of operation and in raising equity.
5.3. Good Public Governance

Good public governance is also a prerequisite for Kilimo Food’s success. For one, there is a need for enforceable commercial law, property rights, and dispute adjudication that enable smallholder farmers to protect their land and other assets from being taken over, for example by large mechanized farming operations. Secondly, there is a need for functioning regulatory institutions that allow establishing a for-profit company with ease. Thirdly, there is a need for reliable financial institutions that can transfer overseas payment in timely and transparent manner, as well as service the rural population, including smallholder farmers.

5.4. Basic Infrastructure

The availability of basic infrastructure is also crucial to Kilimo Food’s success because it reduces transportation and intermediation costs and shortens the distance between smallholder farmers and markets. The lack of reliable and low-cost electrical power, for example, can severely constrain maize milling and the development of cold chains that are critical for maintaining quality of potentially high-value perishable products such as fruit and dairy products. Interruptions of electrical power can greatly increase costs of agro-processing. Depending on the product, processors face the costly choice of throwing out goods in the processing line every time electricity is cut to the plant or investing in costly generators to assure a continuous supply of power. The lack of roads, especially in rural areas, also significantly increases the transportation cost for Kilimo Food who cannot transport their produce from K-Point to the processing facility. Another critical enabler is ICT, which allows smallholders to access financial services and market information while allowing Kilimo Food to monitor smallholder farmers’ progress on their farm.
Availability of mobile banking platform, such as M-PESA, will be crucial to the success of Kilimo Food who operates on a cashless system. Finally, as some of the maturing K-Point farmers begin to transition from staple crops to high-value cash crops, irrigation will become a requirement and access to water will become increasingly important.

5.5. Market Dynamics

Finally, and most importantly, there needs to be a demand for the product at the end of the value chain. Actual and potential demand for the products of African agro-industry is evolving rapidly, driven by a range of factors including rising per capita incomes, market and trade liberalization, changing technologies, population growth and increasing urbanization, with attendant changes in cultural norms and consumption patterns. Having actual and potential demand is therefore prerequisite for the existence of the Company.

6. Conclusion

For several decades, smallholder farmers in sub-Saharan Africa have been trapped in a vicious cycle of subsistence, hunger and poverty and too little attention was given to subsistence farming as a significant opportunity for poverty reduction and economic development. However, the recent economic growth and political footing underway have been a source of renewed hope that sub-Saharan Africa, a continent long synonymous with hunger, AIDS, ethnic wars, and corruption, is starting to turn its page.
An innovative business model is needed to improve smallholder farmers' productivity. As demonstrated by Kilimo Food, a financially sustainable and scalable opportunity exists for a food company that bundles the farmers and aggregates their output; franchises its production unit by standardizing the extension services, allowing farmers and local agents to easily follow; and delivers a holistic solution to the farmers that not only includes extension support, but also includes technical assistance, financial scheme and market access.

The success of such business model, as exemplified by Kilimo Food, is dependent upon the country's macroeconomic stability, public policy and regulations favoring investments into agro-business, good public governance, basic infrastructure and market dynamic. While finding countries that satisfy all of these conditions are still very challenging, never has the political will and the opportunity for agribusiness been so bigger in the history of sub-Saharan Africa. The time is ripe.
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